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Feature Article

Environmental Science and Technology: Cornerstone of Policy-Making

As environmental problems become increasingly widespread, environmental science and technology R&D – as well as its continual upgrading – has become an important part of environmental protection work. This task is both interdisciplinary and interdepartmental, and is always taken into account by the EPA when formulating policy. Environmental science and technology R&D is also an important component of the technological support that the government gives to local industries, helping to raise their technological capabilities and competitiveness.

The complexity of modern pollution problems demands the deployment of environmental technology that can gradually remove pollution and any public health threat. Environmental technology R&D is thus an integral part of environmental policy. During the process of formulating policy it is essential to have all of the necessary environmental data and research results so that thorough, forward-looking planning can be undertaken. It is even more essential to have suitable review and assessment procedures in place when policies are being implemented. Environmental science and technology R&D has a role to play in both policy formulation and review procedures and is thus an indispensable form of technological support for the work of environmental protection.

Environmental science and technology needs interdepartmental and interdisciplinary promotion

The scope of environmental technology R&D is wide, encompassing a number of different government departments and scientific disciplines. The pressure on manufacturers to implement pollution-prevention measures comes, for the most part, from having environmental protection laws. The past decade has seen incrementally stricter enforcement of environmental protection standards that has forced manufacturers to install better facilities and adopt more advanced technology.

Environmental enterprises in Taiwan are all small- or medium-scale enterprises, and hence only have

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limited resources for R&D. As a result, they have to rely upon imported technology and government assistance to raise the standard of environmental technology. The environmental science and technology R&D plan that the EPA has been promoting over the last few years can be divided into three main categories. In 2009, the main tasks were:

A. Environmental Science and Technology R&D Plan

1. Noise pollution, vibration, and non-ionizing radiation: Sets of standards have been revised or drawn up as a result of research into traffic and environmental noise reduction improvement strategies; noise pollution in facilities and premises open to the public; noise quality in public premises; and electromagnetic radiation alarm systems. These standards include the Noise Control Act Fee Collection Standards (噪音管制法規費收費標準), the Noise Control Area Demarcation Standards (噪音管制區劃分作業準測), the Noise Control Standards (噪音管制標準), and the Environmental Noise Volume Standards (環境音量標準).

2. Ecological engineering and biodiversity: Research has been completed on five species of native plants with decontamination capabilities, and the results have been made available to personnel and departments involved in the planning, design, construction, and management of river water purification facilities. The research gives them a scientific basis for the selection of plants to be used in the facilities. The EPA is also undertaking ecological engineering research and budget estimation related to promoting river water purification over the next three years. The EPA has completed a review of 17 items relating to the Surface Water Classification and Water Quality Standards (地面水體水質分類及水質標準), and has put forward a draft of suggested revisions.

3. Waste management: One firm in the copper recycling industry was singled out for thorough factory inspections to ascertain the degree of dioxin and heavy metal pollution being produced by the smelting process. The EPA will use the results to formulate a management plan for the industry, ensure safe recycling, and promote the reduction policy and related incentives. These measures will reduce dioxin pollution at source and increase the economic

benefits of the non-ferrous metal recycling industry.

4. Management of sources and quality of drinking water: Thirty contaminants that were not covered by existing water quality standards were selected and tested for in 2009. Of these, 4 were micro-organisms and 26 were chemical substances. Maximum infection incidence rates for the four micro-organisms were in the range of 8.2/100,000~4.1/1,000,000, which is an acceptable risk in terms of public health. Of the 26 chemicals, 2 have already been added to the Drinking Water Quality Standards control list; 15, including chlorpyrifos, were not detected in tap water; and the levels of the 9 other contaminants, such as haloacetic acids, did not exceed human tolerance levels.

5. Ecolabeling testing and management: The EPA has evaluated the testing methods and technology that domestic and foreign environmental organizations use to decide whether or not a product qualifies for ecolabeling. The EPA has also drawn up a draft plan for Green Mark standards for 6 categories of products including battery rechargers. Meanwhile, another 18 categories have been evaluated for energy saving and carbon emission reduction. The EPA has also completed the task of collating and analyzing information from Taiwan and abroad concerning carbon footprint labeling, and has drawn up a list of suggested ways for future implementation.

B. Environmental Monitoring and Testing Research

1. Environmental monitoring: High-altitude atmospheric background monitoring stations have been established to monitor the effects of long-distance transmission of atmospheric pollutants on Taiwan. The EPA can now track long-distance transmission paths and seasonal variations of various pollutants, and can measure their density in the atmosphere and point to sources. A comprehensive database of information on the background atmosphere is gradually being built up. Taiwan is also now participating in international joint monitoring of the global atmosphere, such as the Aerosol Robotic Network (AERONET) and the Micro-Pulse Lidar Network (MPLNET), and has joined in the US National Oceanic and Atmospheric Administration Global Monitoring Division's (GMD) Carbon Cycle Sampling Program. As always, Taiwan is fully committed to shouldering its share of international environmental responsibilities and promoting international eco-technology exchanges.

2. Environmental testing: The EPA has also been working on developing environmental testing technology suitable for use in the nation's laboratories, and on rapid recognition methods to test for various types of pollutants. The EPA has also been building up a comprehensive database of quality control data that is being made available to both the public and private sectors as a technological basis for research and analysis methods. These include developing testing techniques and methods for liquid chromatography-mass spectrometry (LC/MS-MS) analysis of wastewater from hospitals and pharmaceutical factories for 34 antibiotics and 21 personal care products. Other examples are the establishment of diagnosis ratios for 26 imported crude oil samples, and the assessment of techniques and methods for recognizing marine oil slicks.

C. Cooperation between Environmental Industry and Academia

1. In order to assist domestic environmental industries upgrade technology and speed up the improvement of Taiwan's environment, the EPA has been allocating part of its annual budget to financially assist cooperation between local environmental businesses and incubation centers to research and develop environmental technology and methods. The EPA is hoping for some major breakthroughs that will see the development of methodology specifically suited to local environmental regulations and policies. This would also enhance the technology and profile of local environmental firms.

2. In 2009, implementation of the Environmental Technology Incubation Center Plan resulted in two

patents being applied for: one for a procedure for selective photocatalytic reduction of NO_x, and the other for high-performance elimination of NO_x through photocatalysis and manufacture processes.

3. During the seven years from 2003 to 2009, the Environmental Technology Incubation Center Plan resulted in 20 local patents being granted, with another 55 applications still being assessed. In the same period the EPA assisted 13 companies with 28 cases of technological transfer and 5 companies that entered the mass production phase of operations. In response to the government's "zero waste" campaign, new technology based on molecular biology and nanoscience was also employed to push resource recycling and reuse rates up to 80%.

4. Forward-Looking Environmental Technology Research: In 2009, the EPA implemented five projects that accorded with promoting policies in the National Nanotechnology Plan and implementing the interdepartmental environmental part of the Environment, Health, and Safety (EHS) Core Plan. These projects focused on environmental testing and monitoring technology development, exposure assessment, risk management, and knowledge repository establishment. The development of green nanotechnology for use in environmental testing, remediation, pollution prevention, and the overall goal of pursuing sustainable development was also a major part of the plans. But nanoparticles are also potentially dangerous. Hence, the EPA has also been working on establishing nanoparticle exposure detection and information systems, and related risk management, so that the development of nanotech industries will not be detrimental to the environment or public health. Development of nanotechnology is accelerating, and the EPA is very hopeful that it will come to play an important role in environmental protection and be used to solve pollution problems that were once considered intractable.

Giving technological support to enhance industrial capabilities and global competitiveness

Although funding for the EPA's technology plans is still small it does not suffer from budgetary limitations. A bottom-up strategy is employed that allows each department to allocate funds according to suggestions in the National Technology Development Plan and after careful assessment of actual business needs.



▶ *A laser ablation inductively-coupled plasma mass spectrometry instrument*

The major considerations in managing the plan are integration, sustainability, zero-based thinking, and to what degree it reflects core policy. Also important is informed formulation of government policy so that it both harmonizes with global trends and respects the wishes of the populace.

In response to rapid change in the environment both here and overseas, the EPA has promoted the application of forward-looking technology in environmental management in recent years. For example, the sciences of molecular biology, nanotechnology, and environmental forensics (i.e., environmental pollution verification) have been the subject of considerable endeavor over recent years. Of these, nanotechnology continues to be promoted

by the EPA's Office of Sustainable Development in conjunction with the Department of Health and the Council of Labor Affairs since its scope includes international environmental health and safety issues. Research into other areas is also being undertaken by EPA units: For example, environmental pollution fingerprinting and knowledge repository building are being actively pursued by the Environmental Analysis Laboratory.

In the future, environmental technology will continue to develop and be applied to many aspects of life including public health, industrial safety, green manufacturing, and sustainable development. Providing Taiwan's industries with clean energy sources and enhancing their technological capabilities can only boost their international competitiveness.

Feature Article

First Batch of Taiwan Products with Carbon Labeling Announced

On 4 June 2010, the EPA held a kick-off ceremony for the first batch of Taiwan products to achieve carbon labeling accreditation. Premier Wu Den-yih handed out the certificates and commended manufacturers for their efforts to reduce greenhouse gas emissions in both manufacturing processes and supply chains.

Global warming and climate change have undoubtedly become two of the most pressing international problems of our time. It is now common practice in many countries around the world to analyze the total greenhouse gas emissions of a product during each stage of its life cycle. The total amount is then recalculated in CO₂ equivalents and this figure is indicated on the carbon label as the carbon footprint of the product.

During the opening speech, EPA Minister Stephen Shu-hung Shen reminded the audience that achieving a low-carbon economy is one of the government's major goals. He went on to say that the announcement of the selection process for a suitable carbon label last year culminated in Taiwan becoming the 11th nation in the world to use a carbon labeling system. Since 6 May 2010, the date from which manufacturers have been permitted to apply for carbon labeling for their products, five manufacturers have successfully applied for carbon labeling for seven products including drinking water, beverages, shampoo, LCD screens, and televisions. One of these firms falls in the medium/small enterprise category, a reflection of the importance that all scales

of industry in Taiwan are attaching to environmental protection.

The EPA is keen to point out that awarding carbon labeling to the seven products is not just to reveal the extent of their carbon footprints, but is also a way of asking the five manufacturers to continue efforts to reduce carbon emissions. Taking the shampoo product as an example, analysis has shown that the usage stage of this product accounts for 50% of the product's carbon footprint due to the local custom of always using hot water to wash hair. The manufacturer will thus soon be adding an extract from an indigenous plant species to the shampoo formula in order to make it quicker to rinse out. The EPA is also encouraging consumers to switch to solar-powered water heaters, which have lower total carbon emissions than gas or electric units.

The EPA will continue the task of thoroughly implementing the carbon labeling system and, in accordance with international practice, will also be encouraging businesses to disclose information regarding the carbon footprint of their products and apply for carbon labeling. The firms will also be

pushed to find more ways to reduce carbon emissions. Consumers are also being called upon to play their part by purchasing carbon-labelled products and changing their behaviour based on the information

provided. By adopting better consumption habits, and saving energy and recycling whenever possible, we can all do much to reduce carbon emissions.

 *Table: Manufacturers that have been awarded carbon labeling accreditation*

	Name of firm	Product	Product specs	Carbon footprint of product
1	Taisun Enterprise Co., Ltd.	Taisun TWIST WATER packaged drinking water	600 ml	183 g CO ₂ e (shown as 180 g CO ₂)
2	O'right Co., Ltd.	1000 ml green tea shampoo	1000 ml	1.821 kg CO ₂ e (shown as 1.8 kg CO ₂)
		400 ml green tea shampoo	400 ml	789 g CO ₂ e (shown as 800 g CO ₂)
3	HeySong Co., Ltd.	HeySong sarsaparilla	600 ml	303 g CO ₂ e (shown as 300 g CO ₂)
		HeySong camellia green tea	580 ml	565 g CO ₂ e (shown as 550 g CO ₂)
4	BenQ Co., Ltd.	20-inch LCD screen	20 inches	443 kg CO ₂ e (shown as 450 kg CO ₂)
5	AU Optronics Co., Ltd.	32-inch LCD TV	32 inches	1.255 t CO ₂ e (shown as 1.3 t CO ₂)

Toxic Substance Management

Second Edition of Taiwan's National Communication to UNFCCC Posted Online

One of the principles of the United Nations Framework Convention on Climate Change (UNFCCC) is "common but differentiated responsibilities." In abidance with this principle, on June 5, World Environment Day, the EPA published the Second National Communication to the UNFCCC on its Web site. The draft can also be read on an EPA Web site dedicated to promoting Taiwan's participation in the UNFCCC: <http://unfccc.epa.gov.tw/unfccc/>

Climate change is the most serious international environmental issue that the world faces in the 21st Century. The UNFCCC requires that all of the signatory nations submit a national communication explaining how they intend to implement the specific climate change measures called for by the convention. The national communication should include information pertaining to three major categories: inventories of greenhouse gas emissions

and their removal, implementation of policies laid out in the convention, and implementation of other domestic policies and measures pertaining to achievement of the convention's goals.

The EPA would like to stress that although Taiwan has not been accepted as a signatory to the UNFCCC the nation is still a part of the global community and is actively fulfilling its environmental responsibilities. To

this end, Taiwan is continuing to commit considerable resources toward carbon emission reduction research. The First National Communication to the UNFCCC was submitted in 2002, and the Second National Communication was submitted this year. The 2010 communication is divided into nine sections pertaining to:

- National circumstances and fundamental environmental data
- Greenhouse gas emissions statistics and trend analysis
- Greenhouse gas reduction policies and measures
- Greenhouse gas emissions forecasts

- Climate change impact and adaptation strategies
- Systematic observation and research of climate change
- R&D requirements and technology transfer
- International cooperation and exchanges
- Education, training, and promotion

By voluntarily submitting a Second National Communication Taiwan has once again demonstrated its concerns and its commitment to join the international community in climate change mitigation.

Environmental Monitoring

Joint Monitoring of the South China Sea by Taiwan and US NASA

On 18 June 2010, EPA Minister Stephen Shu-hung Shen travelled to Dongsha Island to chair the South China Sea Environmental Quality Joint Monitoring Results Meeting. The joint monitoring project was the first time that Taiwan had joined forces with the USA and a number of Southeast Asian countries to investigate the extent and effects of air pollution in the South China Sea area. Research focused on two sources of air pollution: sandstorms from mainland China and biomass burning in Southeast Asia. The air quality monitoring exercise lasted for three months and provided valuable first-hand environmental data.

EPA Minister Stephen Shu-hung Shen is keen to draw attention to the assistance the EPA received from Minister of National Defense, Mr. Kao Hua-chu, and the Navy Command



- ▶ EPA Minister Stephen Shu-hung Shen (center) unveils the banner for the Dongsha Island Environmental Quality Monitoring Work Station. Others pictured are (from left to right) Marine National Park Headquarters Director Yang Molin, National Science Council Minister Lee Lou-chuang, US NASA Program Manager Dr. Hal Maring, and Kaohsiung City Marine Bureau Director Sun Jyh-perng.

Headquarters regarding the use of a naval vessel to transport equipment to Dongsha Island for the joint environmental quality monitoring program. The equipment in question included air quality monitoring instruments and US NASA's international-standard background air monitoring system. This was the first time that the EPA has worked with the military to conduct environmental quality monitoring, which not only showed the effectiveness of integrated interdepartmental cooperation but also evidenced the growing willingness of Taiwan's armed forces to help protect the environment.

From 21-23 March 2010, a sandstorm from mainland China blew across Taiwan, lowering local air quality ratings to "poor" or worse. On Dongsha Island, 450 km south of Kaohsiung, the average weekday hourly particle density is 30 micrograms per cubic meter; during the March sandstorm it was 557 micrograms per cubic meter. Such a noticeable variation not only showed how easily air pollution can cross great distances but also demonstrated the importance of the joint monitoring exercise.

The South China Sea joint monitoring exercise was a collaborative effort between Taiwan and the

USA. In addition to EPA personnel, a technical team from National Central University also took part. The exercise was also a model of interdepartmental cooperation between the EPA, the Ministry of National Defense, and the Coast Guard Administration, and was unprecedented in terms of the number of personnel mobilized. Integrating domestic and international research capabilities and carefully using the administrative resources of each department involved made it possible for the monitoring plan to achieve a positive conclusion, demonstrating that Taiwan's environmental quality monitoring has already reached international standards.

The main objectives of the plan were to assess the quality of the environment in the South China Sea by taking samples and to improve techniques and spatial scales of environmental monitoring. What the joint monitoring exercise represented was also of no small significance. Monitoring data was collected up until June, and after being collated and analysed it will be published on the following Web site: <http://taqm.epa.gov.tw/taqm>. Members of the public are welcome to visit the site to view the results.

Soil and Groundwater

Advances in Protecting Soil and Groundwater Following Taiwan-UK Environmental Cooperation

A Taiwan Association of Soil and Groundwater Environmental Protection (TASGEP) team consisting of technicians, engineers, and consultants recently travelled to the UK. The main purpose of the trip was the June 24 signing of a memorandum of understanding (MOU) in London – witnessed by representatives of the governments of both the UK and Taiwan - with Contaminated Land Applications in Real Environments (CLAIRE). CLAIRE is Britain's most prominent non-profit organization in the field of water and soil contamination. Establishing a long-term, mutually beneficial cooperation mechanism reflects both countries' common concern about the issue of water and soil contamination.

It is estimated that there are about 100,000 polluted sites in the UK. In 2008, an EPA team visited a polluted site in London that was being remediated in preparation for use in the upcoming 2012 Olympic Games. The team was much impressed by the way in which the British government actively assisted the private sector to develop an international market for their expertise in the field of soil and groundwater remediation. On returning to Taiwan, the EPA team shared their findings with local organizations and businesses, and actively assisted TASGEP to seek

the cooperation of British experts. After a year and a half of hard work, and with the assistance of the British Trade and Cultural Office in Taiwan, the joint signing of an MOU was arranged.

The MOU suggests ways for the cooperative development of soil and groundwater remediation and management techniques, including visits by both sides, academic exchanges, and joint holding of specialist conferences. It also calls for using the resources of the two organizations to promote and

nurture cooperation with local enterprises in order to gain their assistance in rectifying the soil and groundwater pollution problems that both nations face.

The EPA sees the work of soil and groundwater pollution investigation, remediation, risk management, and technological R&D as one of its major priorities with a budget of NT\$700 million allocated each year. Since 2009, some of this budget – estimated to total NT\$1.65 billion within five years – has been going into the remediation of the China Petroleum and Chemical Corporation's Anshun site in Tainan City. This site is one of over 2,000 polluted sites that have so far been

discovered around the nation, and the EPA inspection teams are working diligently to find any that remain unknown. The budget for remediation could more than double over the next few years, not counting funds invested by the private sector.

In addition to signing the MOU, the TASGEP team also held a symposium on the same day with their British counterparts, and discussed government policy on soil and groundwater remediation. Also mentioned were some experiences and results of remediation projects, the current state of industries in Taiwan, and business opportunities.

Water Quality

New Regulations Governing Industrial Park Effluent Self-Monitoring and Online Data Transmission

More real-time control over the quality of industrial effluent will soon be possible. Industrial parks that are permitted to discharge over 10,000 tonnes of wastewater per day, or industrial parks with sewer systems that have passed environmental impact assessments, must begin to install water quality self-monitoring systems and webcams at the effluent discharge outlet within a year of notification by the relevant environmental protection authority.

In response to advances in water quality self-monitoring and data transmission technology, industrial parks that discharge over 10,000 tonnes of wastewater per day, or industrial parks with sewer systems that have passed environmental impact assessments, now have to install water meters at both the inlets and outlets of the wastewater treatment plant. They must also install water quality self-monitoring systems that can measure temperature, pH, conductivity, chemical oxygen demand, suspended solids, and any other parameters designated by the EPA, as well as webcams at the outlets so that both data and images can be transmitted via the Internet to the EPA for inspection.

The most recent revision of the Effluent Standards

was on 28 July 2009, and included average maximum values. The new requirement for self-monitoring equipment and webcams permanently connected to the Internet is aimed at maintaining suitable control over the quality of wastewater in industrial park sewer systems, and reflects a growing trend for stricter controls on wastewater. The regulations are also for the reference of industrial park operators when installing the necessary self-monitoring equipment and Internet connection.

The EPA predicts that the new measures will provide benefits such as acting as an online early-warning system that will allow immediate modification of control functions, and reducing the likelihood of accidental discharges of polluted wastewater.

Water Quality

Industrial Park Sewer Management Strengthened

The EPA has recently revised the Water Pollution Control Measures and Test Reporting Management Regulations. Nine new regulations have been added pertaining to the management of sewage in industrial parks. This means that there are now regulations covering the whole life cycle of wastewater, from producer to

collection of sewage. It is expected that this will lead to better collection and treatment of wastewater and less pollution in industrial parks.

One of the main requirements of the new regulations is for sewerage system managing authorities to ensure that sewage collection systems are functioning properly. They are also responsible for conducting inspection rounds of manufacturing facilities in the parks to ensure that pre-treatment facilities are functioning and being operated properly, giving guidance where necessary. They are also responsible for conducting regular water quality tests and evaluating and reviewing the capabilities of treatment facilities by comparing inlet and outlet water quality and volumes.

Although the concentrations of pollutants in wastewater being discharged from industrial parks are usually well within the set limits, the volumes of wastewater are increasing each year. The EPA has therefore included in the latest revision to the Water Pollution Control Measures and Test Reporting Management Regulations (水污染防治措施及檢測申報管理辦法) a requirement that operators of sewerage systems must submit pollution reduction plans based on total volumes if deemed necessary by the relevant environmental protection authority. Such a plan would include analyses of the wastewater and a pollution reduction plan stating targets and

timetables. The plans would then be assessed, with implementation to be carried out according to the results of the assessment. It is hoped that this will reduce the danger of an unmonitored accumulation of pollutants.

There are, however, large differences in the nature of water pollution sources that are covered by the Water Pollution Control Act (水污染防治法). The current enforcement rules operate on a "one size fits all" principle, and thus do not take these differences into account. After reviewing the situation the EPA has decided to adopt an enforcement system based on type of industry and scale of operations, which will be piloted by sewerage system management authorities in industrial parks.

The EPA anticipates that the new regulations will mean more work for the managing authorities of industrial parks as they will have to pay even closer attention to manufacturers within park boundaries and take more control of the management of sewerage systems. However, the overall impact on the quality of discharged water in industrial park sewers is expected to be positive.

Air Quality

NT\$5,000 to NT\$100,000 Fines for Food Vendors Violating Air Pollution Control Act

On 9 June 2010, the EPA announced explanatory notes to the Air Pollution Control Act. In the future, food or beverage vendors who are exempt from registration under the Business Registration Act, and have a monthly turnover of less than the business tax starting rate of NT\$80,000, will be fined NT\$5,000–NT\$100,000 for violating the Air Pollution Control Act. The size of the fine will depend on the amount and form that the pollution takes.

The EPA emphasizes that according to the Administrative Penalty Act, fines should be levied in proportion to the ability of the offender to pay. The most common food vendor pollution violations discovered by environmental protection authority inspectors are excessive smoke and foul odors. In the case of factories, such violations would lead to fines of NT\$100,000–NT\$1,000,000. It would, however, be clearly unfair to penalize small food and beverage operators with such severe fines. Considering the

current state of affairs, the EPA has promulgated these explanatory notes in accordance with this proportion principle, and urges food and beverage enterprises to make sure they implement air pollution improvements.

The EPA would like to stress that members of the public who encounter food and beverage vendors creating excessive smoke or foul odors, or are venting smoke directly into sewers, can report them by

calling the toll-free number 0800-066-666. Inspectors will then be sent out to verify the reports and

offenders will be given a fine and a deadline to make improvements.

Climate Change

BSI Becomes First Greenhouse Gas Inspection Authority in Taiwan

After an evaluation process governed by the Executive Yuan Environmental Protection Administration Management of Greenhouse Gas Inspection Authority Guidelines, on 2 July 2010, the British Standards Institution (BSI) Management Systems Taiwan was chosen to be the first officially-recognized greenhouse gas inspection authority in Taiwan.

Reducing greenhouse gases is a mission that manufacturers in Taiwan have become vigorously involved in. It is therefore of crucial importance at this stage to ensure that greenhouse gas inspections and reduction assessments are reasonable, fair, and standardized. This is why the EPA announced the Executive Yuan Environmental Protection Administration Management of Greenhouse Gas Inspection Authority Guidelines (行政院環境保護署管理溫室氣體查驗機構作業原則) last year. The guidelines give clear details about the criteria that inspection authorities have to meet vis-a-vis application and evaluation procedures and the professional qualifications of personnel. The guidelines also state that inspection authorities must apply to, and be approved by, the EPA before they can offer their greenhouse gas inspection services in Taiwan.

On 2 April 2010, the EPA evaluated and approved the accreditation qualifications of the Taiwan Accreditation Foundation (TAF). Since then a number of greenhouse gas inspection authorities have been accredited by the TAF for various inspection categories. First off the mark was BSI, which put in its application for greenhouse gas inspection authority accreditation on April 26. After careful evaluation of all of the information submitted by BSI, on 2 July 2010, the EPA approved the application and BSI

became the first officially-recognized greenhouse gas inspection authority in Taiwan.

BSI has been approved to carry out greenhouse gas inspections of large-scale electronic component manufacturers and project-based energy industries. As for greenhouse gas inspections for other categories of industry, two other inspection companies have put in applications for accreditation: Det Norske Veritas (DNV) Taiwan Branch, and SGS Taiwan.

The EPA stresses that Taiwan needs to establish a comprehensive management system for greenhouse gas inspection and accreditation that fits hand-in-glove with a greenhouse gas enforcement mechanism that is consistent across the board in order to verify that carbon reduction efforts are in line with international practice. The EPA will thus continue to promote mechanisms for managing and training greenhouse gas inspection personnel and put into practice an effective greenhouse gas inspection and accreditation system. These measures will go a long way toward achieving low-carbon sustainability targets. The EPA has a Web site - <http://iggic.estc.tw/> - dedicated to information about industrial greenhouse gas reduction that the public can refer to for more information on EPA evaluations of greenhouse gas inspection authorities and their personnel.

Climate Change

Global High-Tech Industries Climate Protection Forum Held

On 21 June 2010, the EPA, in conjunction with the World Semiconductor Council, held the Global High-Tech Industries Climate Protection Forum in Hsinchu. Dr. Ray Weiss from the University of California, a world expert on measuring atmospheric NF_3 and CFCs, was invited as the keynote speaker. Also invited were Scott Bartos,

a senior manager in charge of global climate change response strategy planning at the US EPA, and a number of other American, Japanese and European representatives from industry, government, and academia.

Professor Weiss is a world-renowned expert in the field of atmospheric greenhouse gas density measurement and quantification. In 2008, he published a report in *Geophysical Research Letters* which detailed his pioneering analysis method for accurately measuring the density of NF_3 in the atmosphere (atmospheric density of NF_3 had previously been immeasurable). During his speech to the forum Professor Weiss talked mainly about trends in atmospheric densities of a number of greenhouse gases. He also mentioned recent improvements to estimation models and an increase in the number of testing sites that should assist in furthering understanding of the distribution of greenhouse gases and long-term trends. Data gathered from atmospheric testing is a valuable reference for government agencies and industries in developing greenhouse gas emission reduction policies.

Following Ray Weiss's speech, Scott Bartos from the US EPA and local academic and industry experts discussed a number of topics. These included the latest international trends and ideas in climate protection and greenhouse gas management; controlling industrial greenhouse gas emissions; and cooperative mechanisms between manufacturers and

their supply chain to reduce emissions.

Many of the participants put forward valuable suggestions on ways to prevent climate change, raise energy efficiency and increase global information exchange. Many anticipated that rapidly-developing high-tech industries could do more to protect the climate by reducing overall energy consumption and using energy resources more efficiently, and by working with their international suppliers to reduce emissions.

The Hsinchu forum happened to coincide with the annual conference of the World Semiconductor Council. As a result, there were a large number of experts and businesspersons representing the fiber optics, solar fiber optics, semiconductor, light-emitting diode (LED), and other high-tech industries, in attendance. The EPA took the opportunity to present a number of papers relating to emissions reduction technology for sulfur hexafluoride (SF_6) and greenhouse gases other than CO_2 , and current emissions from the fiber optics and semiconductor industries during the International High Technology Environment, Safety and Health Conference held by the World Semiconductor Council.

Toxic Substance Management

Retailed Toys Test Negative for Toxic Plasticizer

The EPA recently conducted sample testing for the plasticizer dioctyl phthalate (DOP) in retailed toys for ages three and under. All of the 15 samples tested negative.

Following the EPA's recent random testing of retailed household cleaning fluids for nonylphenols (NP) and nonylphenol polyethoxylates (NPEO), retailed toddlers' toys were recently screened for the plasticizer dioctyl phthalate (DOP). The 15 toy samples were taken from retail outlets in the greater Taipei area and included handheld toys, musical toys, toy vehicles, cartoon figurines, and others. None of the samples tested positive for DOP.

Endocrine disruptors are man-made substances that are present in many of the everyday products and foodstuffs that we regularly come into contact with. In experiments on animals, endocrine disruptors have been found to interfere with hormone secretion, metabolism, and function. They have also been found

to influence some important biological functions in animals such as metabolism, reproduction, and growth. Two of the most common endocrine disruptors are DOP and NP.

The possible harmful effects of endocrine disruptors on human health are attracting more and more attention worldwide. For example, the Stockholm Convention has seen its list of persistent organic pollutants gradually grow to the current 21. In keeping with this trend and in accordance with Toxic Chemical Substances Control Act (毒性化學物質管理法), in December 2006 the EPA announced a ban on the use of DOP in toys designed for toddlers and infants ages three and under. Violators can be fined NT\$1 million to NT\$5 million.

News Briefs

President Ma Warns Against Short-Termism and Calls for Sustainability

The EPA and the Coast Guard Administration recently arranged a day of activities for World Oceans Day on June 8 at which President Ma Ying-jeou gave a speech. The President used the opportunity to emphasize the importance of environmental protection and sustainable business practices, quoting an old Chinese proverb about not fishing with too fine a net in order to leave the smaller fry to grow.

President Ma pointed out that although Taiwan is not a signatory to the United Nations Convention on the Law of the Sea, Taiwan should still abide by the convention as it is based on customary international law. To drive home his point he quoted an ancient conversation in which Mencius tells King Hui of Liang that if seeds are planted during the right season then their grain will never run out, and if nets used for fishing are not too fine then there will always be fish and turtles to eat. President Ma mentioned that Mencius understood the concept of environmental protection over 2,000 years ago, and emphasized that promoting sustainability is even more important in our times.

Environmental Education Fund Financial Management Regulations Preannounced

The Environmental Education Act (環境教育法) was announced on 5 June 2010, and will start to be implemented after one year. A number of related laws are currently being drawn up. Of these, a draft of the Management Regulations for the Income, Expenditure, Custody, and Utilization of the Environmental Education Fund (環境教育基金收支保管運用辦法) has been completed and pre-announced.

During the one-year grace period before implementation of the Act, the EPA will work on a number of related regulations; among them, the Management Regulations for the Income, Expenditure, Custody, and Utilization of the Environmental Education Fund has already been completed. In the future, environmental education funds will not only have to be run according to the stipulations of the Environmental Education Act, but will also have to abide by central government fund management standards. These standards cover the composition, evaluation,

and running of the fund and are laid out in the Budget Act, Financial Statement Act, Accounting Act, Audit Act, and National Treasury Act. The ultimate aim is thorough supervision of all aspects of the fund's operations.

Auto-sampling Equipment to Monitor Industrial Park Air Pollution

During air pollution incidents it is generally not easy for samples to be taken immediately. A new method that the EPA is now employing to assist in tracing sources of excessive air pollution is automatic sampling equipment that self-activates when it detects high levels of airborne pollutants. The new equipment has been installed at three air quality monitoring stations near industrial parks: Daliao, Renwu, and Taixi. When airborne SO₂ exceeds 300 ppb or non-methylated hydrocarbons (NMHC) exceed 6 ppm, the equipment automatically begins to collect samples. The collected samples are then sent for analysis within 16 hours, with the results being used to help trace the pollution source. The new system is making the detection of excessive pollution more accurate and is thus an effective tool in preventing abnormal emissions from pollution sources.

EPOCH Wins Energy Globe Award

EPOCH Energy Technology Corp., one of the firms in Kaohsiung's Environmental Science and Technology Park (ESTP), has won the 2010 International Energy Globe Award in the "Air" category for a system that adds oxy-hydrogen to the fuel in vehicle engines to make them more efficient. EPOCH President Jacky Lin went to Luanda, the capital of Angola, to attend the award ceremony on June 5, and on his return visited EPA Minister Stephen Shu-hung Shen on June 8 to show him the trophy and share his joy of winning it. EPOCH is one of a number of companies that the EPA permitted to set up in Kaohsiung's ESTP. The firm makes solar water heaters and oxy-hydrogen generators. It took many years for them to adapt oxy-hydrogen energy technology for use in vehicles. The award-winning system adds oxy-hydrogen to the fuel in vehicle engines, which allows the fuel to burn completely and thus significantly reduces pollution emissions. Winning the International Energy Globe Award in the "Air" category is just reward for EPOCH's hard work and accomplishments, and demonstrates the effectiveness of ESTPs.

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