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## Feature Article

### Progress in Indoor Air Quality Control

Over the years there has been a change in the way the citizens live their lives, with more time being spent in indoor areas. The impact of indoor air quality on human health has thus become a more important issue, resulting in Taiwan promulgating the *Indoor Air Quality Act* on 23 November 2012 and becoming the second nation after South Korea to have a law dedicated to regulating indoor air quality. A list of the first batch of premises that are to be regulated by the *Indoor Air Quality Act* was announced on 1 July 2014.

#### Effects of Indoor Air Quality on Human Health Draws Greater Global Attention

People are increasingly paying attention to the impact of indoor air pollutants on human health as it has been shown that the quality of indoor air can have a decisive impact on the efficiency and quality of work places. Improving indoor air quality thus not only safeguards human health but also improves work performance.

The issue of indoor air quality and its potential to harm human health has been gathering momentum in recent years following a shift in lifestyles over the

last few decades that has resulted in a majority of residents spending large amounts of time at home or at work in closed-off rooms using air conditioning to keep the temperature at a comfortable level. This has led to the emergence of sick building syndrome, with insufficient fresh air circulating through some buildings and air-borne pollutants thus accumulating to the point of affecting indoor air quality. In 1982, sick building syndrome was officially recognized and defined by the World Health Organization.

Outdoor sources of pollutants – such as motor vehicle exhaust and factory emissions – in combination with poorly maintained air intakes and filters of air

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conditioning systems where micro-organisms can reproduce, also have the potential to affect indoor air quality. As a sub-tropical nation, Taiwan is hot and humid for most of the year, conditions amenable for fungi and bacteria to reproduce easily. Thus it is important to regularly clean and maintain air conditioning systems.

## Taiwan the Second Nation to Regulate Indoor Air Quality

The average citizen spends around 90% of each day indoors, and is thus exposed to toxic substances such as formalin, toluene, and volatile organic compounds (VOCs) that are produced in indoor environments and are known to be harmful to human health. In 2005, the EPA announced its *Suggested Values for Indoor Air Quality* and in 2006 began research and preparations for a draft of the *Indoor Air Quality Act*. The draft was approved by the Executive Yuan in 2008 and then sent to the Legislative Yuan for further review. Public opinion was strongly in favor of the bill, and on 8 November 2011 it passed both the second and third reading. On 23 November 2011, the act was promulgated and came into effect one year later. Taiwan thus became the second nation to have a law

dedicated to indoor air quality control, with the act representing a milestone in the mission to improve indoor air quality.

The EPA announced five new regulations to accompany the implementation of the *Indoor Air Quality Act* on 23 November 2012. They were: the *Indoor Air Quality Act Enforcement Rules*, the *Indoor Air Quality Standards*, the *Regulations Governing Dedicated Indoor Air Quality Management Personnel*, the *Regulations Governing Indoor Air Quality Analysis Management*, and the *Fine Determination Criteria for Violations of the Indoor Air Quality Act*.

Air quality standards are based upon the *Suggested Values for Indoor Air Quality* that was promulgated on 30 December 2005 in order to maintain and improve indoor air quality. The standard values for indoor air pollutants include: 1,000 ppm for CO<sub>2</sub>; 9 ppm for CO; and 0.08 ppm for toluene. For total VOCs, a combination of 12 different VOCs, the standard value is 0.56 ppm; for bacteria it is 1,500 CFU/m<sup>3</sup> (colony-forming units/m<sup>3</sup>); and for fungi it is 1,000 CFU/m<sup>3</sup>. For particulate matters (PM<sub>10</sub>) the value is 75 µg/m<sup>3</sup>, while for fine particulate matters (PM<sub>2.5</sub>) it is 35 µg/m<sup>3</sup>, and for ozone it is 0.06 ppm.



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## Regulation of First Batch of Announced Premises Effective from 1 July 2014

To facilitate the rolling out and administration of the *Indoor Air Quality Act*, on 23 January 2014 the EPA announced the formulation of the *First Batch of Announced Premises Regulated by the Indoor Air Quality Act* that will be the legal basis for regulating selected premises. The announced premises were selected according to criteria laid out in Article 6 of the *Indoor Air Quality Act*. The EPA took into consideration overall visitor numbers, visitor entry and exit numbers, levels of risk of harm from indoor air pollutants, and any unique requirements for each of the premises. A list of indoor air pollutants and the scope of indoor areas to be regulated for each category of announced premises were also drawn up in accordance with the *Indoor Air Quality Standards and Indoor Air Quality Testing Management Regulations*.

The list of announced enterprises came into effect on 1 July 2014. After this date, all listed premises should begin the task of maintaining indoor air quality in accordance with the *Indoor Air Quality Act*. Operators of listed premises will be given a grace period to allow sufficient time for drawing up indoor air quality maintenance and management plans and to implement all of the requirements of the first periodic indoor air quality analysis. The first batch of announced premises includes: public premises; large-scale premises; premises where overall visitor numbers and visitor entry and exit numbers are large; and premises visited by vulnerable groups such as the elderly, students, etc. The sub-categories for said premises include: tertiary education institutions; libraries; hospitals and clinics; social welfare premises; government offices; railway transportation premises; civil aviation transportation premises; mass transit stations; exhibition centers; and shopping malls.

### Air Quality

## Changes to Halon Fire Extinguisher Controls Considered

Considering halon fire extinguishers are still required for use by the military and the aviation industry, the EPA has drawn up a draft of revisions to the *Regulations Governing Chemical Substances Listed in the Montreal Protocol*. The revisions modify the listing of halon fire extinguishers so that their use can be reviewed on a case-by-case basis by the relevant industry competent authorities.

In order to abide by the stipulations of the *Montreal Protocol on Substances that Deplete the Ozone Layer*, Taiwan has adopted at-source restrictions and drawn up a set of criteria for permit applications to import, export or manufacture ozone-depleting substances (ODS) for special uses. Taiwan aims to keep tight control over the circulation of ODS and prevent them from being discharged into the atmosphere. However, in some key areas – such as the aviation industry and the military services – there are no alternatives to the use of halon fire extinguishers. In such special cases the government has thus decided to allow the import of products that contain ODS.

Halon fire extinguishers are still necessary for use by Taiwan's armed forces and aviation industry, and aviation equipment containing halon must be approved by the industry competent authorities

in order to meet aviation industry regulations. For aviation equipment businesses wishing to import or export halon fire extinguishers, permit application procedures have been simplified by the amendments to the *Regulations Regarding Chemical Substances Listed in the Montreal Protocol*, which modify the listing of halon fire extinguishers so that the use of such equipment can be evaluated on a case-by-case basis by the relevant industry competent authorities. In addition, the definition of listed chemical substances has been modified, regulations concerning the export of listed products have been deleted, regulations regarding deadlines for submitting supplementary information for incomplete or incorrect applications have been added, and the stipulation that returned cargo should be handled according to the *Customs Act* has been amended.

## Environmental Analysis

## Six-meter-long Mobile Air Quality Analysis Laboratory Hits the Road

To further safeguard the health of citizens, the EPA's Environmental Analysis Laboratory has been working with manufacturers to build a mobile high-tech analysis laboratory. The 6-meter-long vehicle can operate 24 hours a day at the sites of suspected air pollution incidents, analyzing air samples to facilitate the planning of suitable responses.

The Environmental Analysis Laboratory and a number of manufacturers have been cooperating on integrating the latest air quality analysis technologies into a 6-meter-long mobile analysis laboratory. These technologies include 24-hour monitoring cameras, a Global Positioning System (GPS), a system that reports abnormalities in air quality, and remote control of some functions. The use of cloud computing and wireless data transmission ensures that the mobile unit is secure and functioning properly whenever it is stationed at a monitoring location.

The mobile analysis laboratory is equipped with a proton transfer reaction time-of-flight mass

spectrometer (PTR-TOFMS) that can immediately be dispatched to the most sensitive location to begin real-time monitoring when air pollution incidents occur. In conjunction with its trigger-sampling equipment, this allows for samples to be automatically collected in stainless steel tubes whenever high pollution values appear. These high-value samples can then undergo more accurate measurement and analysis in order to verify the degree of danger to public health.

As well as a PTR-TOFMS, the vehicle is also equipped with a proton-transfer-reaction quadrupole mass spectrometer (PTR-QMS), a stainless steel trigger-sampling instrument and a bench top high-resolution gas chromatography/low-resolution mass



▶ The EPA's newly established 6-meter-long mobile analysis laboratory



spectrometer (HRGC/LRMS). The cost of these four systems alone is NT\$30 million, and in the future the EPA expects to purchase more cutting edge, top-range monitoring equipment to be installed in the vehicle.

The instruments onboard the mobile analysis laboratory will be used to conduct real-time monitoring of air-borne pollutants. Apart from a small minority of chemical compounds that cannot be properly detected by the proton-transfer-reaction mass spectrometer with H30+ ions (PTR H30+), the large majority of organic and inorganic gaseous air pollutants – including ozone-depleting chemicals and organic solvents – can be monitored in real-time by the instruments. The instruments are sensitive enough to detect concentrations as miniscule as 0.01 ppb and can quickly and accurately determine which air pollutants are present in the samples. The Environmental Analysis Laboratory also spent four years working with National Central University's Department of Chemistry to develop a wind model

and 3-dimensional dispersion model for use with the instruments to allow for even greater accuracy in identifying pollution sources at the site.

The combination of PTR-QM/PTR-TOFMS and the trigger-sampling method allows for rapid analysis of chemicals found in the samples. Being able to immediately capture air samples as an air pollution incident occurs will allow for the samples to be preserved as evidence and sent to laboratories for precise composition analysis if necessary. Although the mobile analysis laboratory has exceptional functionality, its size and the fact that it consumes a large amount of electricity means that it must be taken by truck to monitoring sites and connected to a 220V/100A power source. Being much larger than any other air quality monitoring vehicle in Taiwan, it has earned the nickname, "the aircraft carrier of the air quality monitoring fleet."

## Toxic Substance

# Draft of Regulations Governing Toxic Chemical Incident Response Vehicles Preannounced

To make responses to toxic chemical incidents more direct and more effective, the EPA has formulated a draft of the *Regulations Governing Toxic Chemical Incident Response Vehicles*. The regulations cover vehicle colors and markings, standard equipment to be carried and their designated uses, as well as the qualifications vehicle drivers must obtain.

Toxic chemical incident response personnel need to rush to accident scenes as quickly as possible to begin implementing response measures and thus safeguard the health of nearby residents and reduce potential environmental damage. To this end, an amendment to the *Toxic Chemical Substances Control Act* was announced on 11 December 2013 to waive speed limits for vehicles – belonging to either the competent authority or the toxic chemical transportation operator – that have been dispatched to deal with toxic chemical incidents. As long as the said vehicles operate a flashing beacon and audible siren en route to emergency sites they are also exempt from traffic sign, traffic light, and road marking restrictions.

The EPA has thus formulated a draft of the *Regulations Governing Toxic Chemical Incident Response Vehicles*. The regulations cover vehicle colors and markings, standard equipment to be carried and their designated uses, qualifications vehicle drivers must obtain, registration criteria for transportation operators, task implementation supervision and management, and other regulations that must be abided by.

Details of the above regulations have been published on the EPA's website: [http://ivy5.epa.gov.tw/enews/fact\\_index.asp](http://ivy5.epa.gov.tw/enews/fact_index.asp).

## Ecolabeling

## Green Point Pilot Scheme Begins with Roll out Set for 2015

In July 2014, the EPA began trials of its environmental bonus points – or Green Point – system with the cooperation of a number of enterprises. The system allows consumers to accumulate bonus points every time they buy green products or do something to help the environment, such as saving energy or water. The points can then be exchanged for green products or services, environmental education courses, or entrance tickets to eco-leisure areas. The points can also be redeemed through multiple channels. The system is expected to be formally up and running sometime in 2015.

Based on the concept of adding value to environmental activities, the system allows consumers to exchange points for cash or discounts on green products in order to encourage them to adopt greener lifestyles and shopping habits. A logo for the system has already been unveiled, and as of the launch of the trial run in July 2014, the following organizations will be holding a series of promotions to promote the Green Point system and to offer discounted products.

- the General Welfare Service of the Ministry of National Defense

- Tatung Consumer Products (Taiwan) Co., Ltd. (Tatung 3C)

- Far Eastern Ai-Mai Company Ltd. (FE-a.mart)

- Hi-Life International Co., Ltd. (Hi-Life convenience stores)

- Da Fon Environmental Technology Co., Ltd.

- Ding Ding Integrated Marketing Service Co. (HAPPY GO consumer reward scheme)

- ZOJIRUSHI Taiwan Corporation



▶ Representatives of the EPA and the enterprises that are part of the multi-channel Green Point system, and the selected logo (third from right)

•Hwang Kuan Metal Industrial Co. (THERMOS)

The EPA hopes that this year's pilot scheme will lead to growth in the market for green products and more and more people making environmental protection an integral part of their daily lives.

As a part of the pilot scheme all of the aforementioned companies are offering discounts on their products. Details on all related promotions can be found on the EPA's Green Living website: <http://greenliving.epa.gov.tw/>.

Many local government environmental protection bureaus are also holding activities to publicize the environmental bonus point scheme, including Taipei City, Taichung City, Tainan City, Chiayi City, Yilan County, Hsinchu County, and Chiayi County. The EPA is urging all residents to lend their full support to

the scheme and to make environmental protection a part of their daily lives.

The EPA has also announced its selection for the Green Point logo. The logo features a green leaf in the shape of the symbol for infinity ( $\infty$ ) to convey the concept of green shopping and to symbolize the sustainability and renewability of low-carbon, energy saving, carbon reduction, and resource recycling. The green dot in the upper right hand corner represents the various types of low-carbon behavior and environmental actions that can be turned into bonus points to be accumulated and redeemed. The infinity symbol (the body) also combines with the green dot (the head) to make a human figure that signifies that the scheme is for everyone to take part in, so as to contribute a bit to environmental protection while having fun collecting and spending the green points.

## Recycling

# Single-use Cup Recycling Machine Trialed to Encourage Recycling

The EPA is implementing the *Waste Single-use Cup Automatic Recycling Pilot Plan*. From now until 30 November 2014, people in Taipei visiting the Gongguan shopping district will be able to try out the automatic single-use cup recycling machine installed there, and earn some bonus points while demonstrating their concern for the planet.

The machine issues five PushMe points to the user's mobile phone number every time it is used to recycle a single-use cup. An app can also be downloaded to smartphones to keep check of how many points have been accumulated and get information on which stores are offering what discounts in exchange for the PushMe points. At present, there are over 500 stores nationwide where the points can be exchanged for discounts on goods or services. Using smartphones to collect and spend points at the touch of a button removes the need for points cards or points stickers, making it a method that is both eco-friendly and economical.

The single-use cup recycling machine has a number of functions, including material recognition, recycling volume reduction, and issuance of PushMe point rewards. It can recycle all of the commonly-used beverage cup materials, including paper,

polypropylene (PP), expanded polystyrene (EPS) and polylactic acid (PLA). The bonus point operator PushMe is trialing a recycling point model for the pilot scheme that will hopefully lead to the creation of a new recycling regime in which consumers, businesses and the environment are all winners.

The EPA would also like to remind members of the public not to litter their beverage cups and other waste containers but to prevent environmental pollution by recycling such items at the facilities provided by stores such as beverage vendors, convenience stores, supermarkets, and megastores. Recycling bins can also be found at many public premises.

## Public-Private Partnerships Discussed for Carbon Reduction

On 26 June 2014, the EPA and the European Chamber of Commerce Taiwan (ECCT) jointly held a lunch meeting entitled *European Experiences in Public-Private Partnership: the Key to Mitigating Climate Change*. The lunch was attended by EPA Minister Kuo-Yen Wei; ECCT Chairman Giuseppe Izzo; European Economic and Trade Office (EETO) Head of Office Frederic Laplanche; Deputy Director of British Trade & Cultural Office in Taiwan, Damion Potter; and Alex C. Lei, Executive Director of the State of Hawaii Office in Taipei. Also in attendance were many local and European industry representatives. There was general agreement that building public-private partnerships and strengthening technological exchanges with transnational corporations would be very helpful in bringing about both a low-carbon economy and sustainable business operations.

At the lunch, EPA Minister Kuo-Yen Wei said that inviting European officials and industry representatives to exchange ideas on public-private partnerships for carbon markets shows that Taiwan is committed to seeking out innovative strategies to reduce carbon. As ECCT Chairman Giuseppe Izzo pointed out, carbon reduction has become a common goal for international society, with carbon trading now established as an effective mechanism for reducing carbon. He said that learning from Europe's experience would help Taiwan to achieve its carbon reduction targets, and that commercial cooperation in improving energy source efficiency and developing renewable energy sources would allow for the setting of even more ambitious targets. He also pointed out that developing low-carbon manufacturing would also transform industry and lead to sustainable development, and that the EU would be delighted to form public-private partnerships with Taiwan's public and private sectors to help strengthen Taiwan's carbon reduction plans.

EETO Head of Office Frederic Laplanche emphasized that there need not be a conflict between industrial development and reducing carbon emissions, and pointed out that in the past 30 years the hard work of EU nations had resulted in the EU meeting 80% of carbon reduction targets while still being able to maintain 40% growth in gross domestic product. Mr. Laplanche called this "microeconomic vision" and emphasized that if carbon reduction is neglected today, there will be an even higher price to pay in the future.

Erdal Elver, the Chief Executive Officer of Siemens Ltd., Taiwan, explained the German model for public-private partnerships and presented an example of the technological assistance that Siemens has provided in Taiwan. In particular, he described his company's work on the low-emission mass transit system provided to the Kaohsiung City Government for the benefit of its residents.

Siemens is also working with the UK government to build the largest offshore wind farm in the world, which will produce enough electricity to supply 40,000 homes. Among the ECCT members who are currently jointly promoting the Low Carbon Initiative in Taiwan are a number of well-known corporations from Spain, Italy and Germany who are also participating in the EPA's Clean Development and Carbon Credit Management Strategic Alliance. Dr. Joanna Lei, President of the Taipei GHG Infrastructure Steering Association, also gave a presentation in which she stressed that all market mechanisms should serve the purpose of helping human beings to reduce emissions, but that it is by no means certain that the market mechanisms that have been jointly established will be able to meet carbon reduction targets in the future. She called for a thorough review of how the market mechanisms are currently operating in the real world and how they can be used to guide the development of low-carbon economies in which carbon reduction targets can be met.



## Taiwan and UK Hold Training on Low-carbon Cities for Mid- and High-Level Officials

From 23-27 June 2014, the EPA held the Workshop for Mid- and High-Level Implementors of the Low-carbon Sustainable Homeland Program in conjunction with The Bartlett School of Architecture of University College London (UCL), the first time the two organizations have worked together. The five days of training included personalized courses and classes based on dynamic group discussions. The training was designed to develop deeper and more lateral thinking among Taiwan's low-carbon sustainability planners and policymakers. Twenty mid- to high-level officials from central and local governments participated in the program.

The building of low-carbon cities is a very important part of the energy saving and carbon reduction strategies and measures being adopted by nations worldwide, and many major cities are taking pride in developing low-carbon infrastructure. Low-carbon policymaking touches upon a number of special fields, including environment, energy, transportation, building and construction, land planning, and laws and regulations. Interdisciplinary integration is thus essential for avoiding wasteful repetition and conflict between written regulations and practical administration. It is therefore invaluable to learn how to apply spatial governance, strengthen strategic integration, and break down the barriers between one's own position and other disciplines so that all related plans and measures are imbued with the concept of low-carbon sustainability. Learning and practicing these skills was the goal for the workshop.

As EPA Deputy Minister Shin-Cheng Yeh explained at the beginning of the workshop, The Bartlett School of Architecture is a large institute that combines a number of disciplines – including design, architecture, planning, development, construction, and facilities management – under one roof. This superior capability is the reason it has long been chosen to advise the British government on building low-carbon urban infrastructure, sustainable development strategic planning, and other professional topics. The Bartlett also designs tailor-made training courses for planners, policymakers, and other professionals in various government departments.

With regards to the training program, the EPA and UCL designed the course based upon the current state of low-carbon urban development in Taiwan. The course content included overall framework planning for low-carbon sustainable strategies, policy implementation, financial planning, and effective

assessment of low-carbon cities. Also included was a review of interactions, cooperation, and mediation between the stakeholders that determine the success or failure of a project (including between central government departments, central and local government, and with the populace). Concepts were introduced to deliberate from the point of highest level, starting with consideration of the reasons and processes behind the formation of policies. The course then moved on to combining theoretical tools and practical skills to implement systematic planning for basic-level administration while applying non-conventional ways of thinking. The trainees were also shown how to nurture the development of knowledge and techniques to create a low-carbon sustainable homeland, how to teach others about sustainable development and urban management, and how to use the principles of planning for low-carbon sustainable cities.

UCL sent three of its most experienced experts on low-carbon city planning and construction – Professor Peter Bishop, Dr. Marcos Cruz, and Mr. Oliver Wilton – to Taiwan. They all have many years of hands-on experience in the fields of low-carbon architectural design, urban planning and development, and the green economy, and have visited a number of countries in Europe and Asia to lecture or hold similar training programs. They were thus able to provide an excellent overview of the building of low-carbon cities and offer unique insights and solutions into some of the problems that might be encountered.

## Water

## Agongdian River Water Quality Improvement Works Completed

A ceremony was held on 9 June 2014 to mark the completion of the Agongdian River Hehua Bridge Upstream Section Water Quality Improvement Project of the Kaohsiung City Government. The project, subsidized by the EPA, involved constructing a gravel contact oxidation facility that can treat up to 8,000 tonnes of polluted water daily and diverting a number of effluent channels towards it. The project will lead to improved water quality upstream of Hehua Bridge, and is a part of the Kaohsiung City Government's Agongdian River environmental development scheme that will transform a polluted water area into a clean one where local residents can take a pleasant walk. The improved water will also be used to irrigate fields along the lower stretches of the river.

The Agongdian River flows through the Gangshan district of Kaohsiung City, an area that has seen rapid population growth and industrial development. The ever-increasing volumes of effluents being produced are thus a significant pollution burden on the river. Results of EPA water quality monitoring done in 2011 on the Agongdian River showed that 35% of its length was heavily polluted, with the section between Agongdian Bridge and Chianchou Bridge being the most severe. This particular section of the river suffers from insufficient base flow, and further downstream there are water intake points for irrigation that were built by the Department of Irrigation and Engineering.

In order to reduce pollution and safeguard the source of irrigation water, in 2012 the EPA issued a grant of NT\$77 million to the Kaohsiung City Government to conduct improvement works on the section of the Agongdian River upstream from Hehua Bridge. The works involved constructing a gravel contact oxidation facility in the river park and diverting ten open air effluent drainage channels between Shenglin Bridge and Agongdian Bridge towards the new installation. The facility can treat up to 8,000 tonnes of polluted water daily, reducing biochemical oxygen demand by

410 kg. The treated water then flows back into the Agongdian River to supplement the river's base flow. In addition, five other open air drainage channels have been diverted to flow into the Agongdian River downstream from the irrigation water intake points to safeguard the source of irrigation water. With these two systems in operation, water quality of the Agongdian River is bound to improve.

Sewage system construction is a fundamental part of greywater treatment. Construction of the Gangshan/Ciaotou sewage system began this year, with the first stage of the project expected to be completed in 2017. Before this sewage system is completed, on-site water purification facilities will be installed to reduce the amounts of pollutants entering the river. The EPA has also requested the Kaohsiung City Government to continue inspections and strict enforcement of restrictions on factories and livestock farms that operate within the Agongdian River basin, as well as promptly removing trash on the river surface and river banks and properly maintaining eco-friendly river landscapes. Such measures will assist the remediation effort to create a sustainable and pleasing riverside living environment.

## Water

## Keya River Greywater Diversion System Inaugurated

EPA Deputy Minister Shin-Cheng Yeh visited Hsinchu on 9 June 2014 to participate in an inauguration ceremony for three greywater diversion stations of the Keya River in the Xiangshan area. He then went on to inspect the wetland construction works for the water purification plan at Xipuzi on the Touqian River and made remarks on the river water quality improvement works of Hsinchu City.

Hsinchu City's second phase sewage system construction plan requires a substantial budget for construction projects spread across the city. It seems unlikely that, within the short term, the water

quality of Keya River can be improved by the construction of a sewage system. Thus, in order to facilitate river water improvement and give local residents a better riverside environment, in December 2012 the EPA approved a subsidy of NT\$27,205,000 for the Hsinchu City Government to build greywater diversion stations in the Xiangshan area of the Keya River, an example of an interregional value-added construction project. Taking advantage of the overcapacities of the already constructed primary and secondary sewers, these three stations will divert up to 7,500 tonnes of greywater to the Keya Water Resource Center for treatment every day, thus significantly reducing pollution in the Keya River.

The drainage system at Xipuzi on the Touqian River is the largest one in Hsinchu City in terms of area for collecting water, with 200,000 people living within the catchment area. The wastewater in this area has pollution levels ranging from medium to serious. In July 2013 the EPA approved a subsidy of NT\$31.5 million for the Hsinchu City Government to undertake water purification works in the Xipuzi constructed

wetlands. The works occupy an area of 12 hectares and treat 16,000 tonnes of wastewater daily, while reducing biochemical oxygen demand by 43 kg and removing 200 kg of suspended solids from the water every day. The construction of the wetlands is currently progressing smoothly toward the estimated completion date of 9 January 2015.

As Deputy Minister Yeh has pointed out, environmental awareness has taken hold among the general public and, as a result, people are gradually starting to pay attention to the quality of the water in their surrounding environment. Remediating polluted rivers is a long process, and improving water quality needs full public participation. The completion of the two water purification works in Hsinchu City will not only improve water quality in the Keya River and the Touqian River but will also lead to cleaner conditions on the riverbanks and in the eco-corridors. It thus will increase their appeal to locals and visitors as good locations for leisure activities and environmental education.



▶ Deputy Minister Shin-Cheng Yeh (left) inspects the wetland construction work on the Touqian River

## News Briefs

### Workshop on Asian Capacity Building for Carbon Market Focuses on European Experiences

On 25 June 2014, the EPA joined forces with the European Economic and Trade Office (EETO) to hold the 2014 Workshop on Capacity Building of Regional Carbon Market in Asia: Experiences from Europe. Experts and scholars from governments in the EU and neighboring nations, as well as from major international organizations, came to Taiwan to discuss ways of building connections among international carbon markets. Over 150 participants gathered in the conference and discussions were lively and fruitful. In his opening remarks at the workshop, EPA Minister Kuo-Yen Wei emphasized that human activity was the major factor driving climate change. He called for the nations of the world to reach a consensus on how best to balance environmental protection with energy security and economic development, and said that action is needed immediately to keep climate change within safe parameters. Head of the European Economic and Trade Office (EETO) Frederic Laplanche stated that the EU has considerable expertise and experience in developing carbon trading mechanisms that have made substantive contributions to EU efforts to reduce greenhouse gas emissions and meet its carbon reduction targets while still maintaining economic growth. Mr. Laplanche pointed out that China, the US and South Korea are all gradually developing carbon markets, and said that he hoped that the workshop would give the Europeans the opportunity to share their knowledge and experience in setting up carbon markets with the delegates from Taiwan and the other nations present.

### Recycling Fee Rates for Straight Fluorescent Tubes Raised from 1 July 2014

In recent years the recycling rate of waste light tubes (and bulbs) increased by a wide margin in Taiwan, resulting in a subsequent upsurge of subsidies paid by the Recycling Fund. In order to stabilize the operations of the waste lighting source recycling system and the Recycling Fund, the EPA raised the recycling fee rates for fluorescent tubes to NT\$41 per kilogram. At present, the bulk of recycled fluorescent tubes are of the conventional straight type, so the subsidies paid for their recycling are on the rise. The EPA reminds the responsible enterprises that, starting from 1 July 2014, all manufactured or imported lighting sources are subject to the new fee rate so as to facilitate the recycling of the waste lighting sources.

### Ninety-eight Percent of Nearly 70,000 Listed Public Toilets Rated Excellent

The cleanliness of public toilets is regarded by some as an indicator of how progressive a nation is, and to this end the EPA has been working hard at listing 70,000 or so public toilets around Taiwan. Multi-point inspections carried out by the EPA have shown that 98% of these facilities rank as "excellent" for sanitation, which is reflected in public opinion surveys for the last two years that show public satisfaction with improvements in public toilets is increasing year-on-year. The EPA has been implementing its plan to raise the overall hygiene of public toilets by checking the following: whether or not any items are damaged or broken; whether or not the urinals/toilets, floor and wash basins are grimy or dirty; and the cleaning record for each facility. The inspectors also give scores for each of the following parameters: energy-saving illumination; water-saving installations, availability of cleaning utensils that can be easily used by toilet users; reminding signs that indicate toilet facility etiquette; availability of toilet paper and hand soap; and additional hygiene inspections. From January to May 2014 the EPA inspected 315,715 toilet facilities. In 2012, 45% of people surveyed said that they felt there had been an improvement in the overall standard of public toilets; by 2013 that figure had risen to 67%.

### EPA Requires Farmers to Rinse Pesticide Bottles Three Times Before Recycling

The EPA has been holding the "Rinse Pesticide Bottles Thrice before Recycling" events around farm villages from June to November 2014. The events include 20 recycling activities and five explanatory meetings to urge farmers that pesticide bottles have to be rinsed with clean water three times and then have the cap screwed on tightly before handing them in for recycling. The EPA is also reminding farmers that the water used to clean the bottles can be collected and used as diluted pesticide. Used pesticide bottles are listed as recyclable items that can be handed in to local recycling operators, refuse collection teams, or, in some places, Farmers' Association offices or agricultural supply stores. In Taiwan, around 1,000 tonnes of pesticide bottles are recycled annually. EPA personnel recently toured around the nation to ensure farmers in remote villages were fully informed of the importance of resource recycling and to help in the recycling of pesticide bottles close to the site of use.

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