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Feature Article

Important Regulations Announced to Ready Taiwan for Carbon Pricing Era

The MOENV announced on 12 October the *Management Regulations for Voluntary Greenhouse Gas Reduction Projects* (溫室氣體自願減量專案管理辦法) and the *Management Regulations for Greenhouse Gas Emission Increase Offsets* (溫室氣體排放量增量抵換管理辦法). These are important subsidiary laws aimed at promoting emission reduction. The regulations for the trading of voluntary reduction credits and other subsidiary laws pertinent to carbon fee collection are being developed, readying Taiwan for the era of carbon pricing in 2024.

The *Climate Change Response Act* (氣候變遷因應法) was promulgated and came into effect on 15 February this year. It includes a range of diverse tools to promote effective carbon reduction, such as greenhouse gas inventory, inspection, carbon fee collection, voluntary reduction, and emission increase offsets. Following the recent amendments and publication of the three related subsidiary laws on inventory and inspection, regulations related to emission reduction were also put into effect in early October.

The MOENV stated that, in order to achieve the "net-zero carbon emissions by 2050" goal, carbon fee collection is the most crucial measure, with voluntary reduction and emission increase offsetting being two important complementary measures. During the climate act amendment process, consensus was reached among all sectors that carbon fees should be collected from major emitters, and this should be accompanied by specific targets and voluntary reduction plans to enhance and expedite their emission reductions.

Meanwhile, a voluntary reduction mechanism is being promoted to encourage enterprises and government agencies at all levels to propose voluntary reduction projects and implement them. Upon implementation, these enterprises and agencies can obtain "reduction credits," commonly known as "carbon credits," which can be used by enterprises to offset carbon fees or be traded with those who need them.

The *Management Regulations for Voluntary Greenhouse Gas*

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Reduction Projects (hereinafter referred to as Voluntary Reduction Regulations), is a regulatory framework that governs the application for domestic emission reduction credits. Its contents include how to establish voluntary emission reduction measures, verification methods and more, in accordance with the law. The formulation of this sub-law primarily referenced international trends in voluntary carbon market developments and adopted the "three-plus-five principles" (measurable, reportable, and verifiable; additional, conservative, permanent, avoiding environmental harm and avoiding double-counting situations). It also reviewed the past experiences of implementing the *Management Regulations for Greenhouse Gas Increase Offsets* in Taiwan to streamline procedures and enhance efficiency. The sub-law consists of a total of 23 articles.

Applicants should plan and implement emission reduction measures based on the reduction methods approved and published by the MOENV. They can choose from various types of measures, such as "removal" (e.g., afforestation, forest carbon sinks, marine carbon sinks, etc.) or "reduction or avoidance of emissions" (e.g., energy efficiency improvements). The application process involves the registration and credits review stages, which require third-party confirmation and verification. For applications with reduction methods that are mature, involve easy and clear calculation, and have been implemented in Taiwan (e.g., replacement of lighting fixtures or water chillers), verification is exempt in the registration stage to reduce the burden on applicants. If there are no applicable reduction methods, new reduction methods can be applied for approval.

During the time when the *Greenhouse Gas Reduction and Management Act* (溫室氣體減量及管理法) was in effect, 93 emission offsetting projects had been approved, resulting in a total reduction of 24.37 million metric tons of carbon emissions via means such as energy efficiency enhancements, switches to low-carbon fuels, destruction and removal of fluorinated gases, green energy, waste recycling, and low-carbon transportation. Entities that have already applied for renewable energy certificates, and factories of enterprises that fall within the scope of carbon fee collection and have implemented emission reduction or prevention measures for over three years, are not eligible to apply for voluntary reduction projects. This ensures compliance with the aforementioned "three-plus-five principles." Applicants who originally applied for emission offset projects under the *Management Regulations for Greenhouse Gas Offset Projects* (溫室氣體抵換專案管理辦法) can still proceed with their approved offset plans and apply for reduction credit verification under that regulation, or they can apply to switch to voluntary reduction projects within two years.

The *Management Regulations for Greenhouse Gas Emission Increase Offsets* (hereinafter referred to as the Increase Offset Regulations) deal with the impacts of greenhouse gas emissions resulting from new development projects on climate change and aim to establish a consistent approach nationwide. In the past, central and local governments required developers of projects that required environmental impact assessments (EIAs), such as science parks, industrial parks, or high-rise buildings, to carry out offsets for a certain proportion of greenhouse gas emission increase caused by the projects. The *Principles for Reviewing Greenhouse Gas Emission Offsets of Development Activities* (行政院環境保護署審查開發行為溫室氣體排放量增量抵換處理原則) has also been formulated to include this requirement in EIAs.

In accordance with the Increase Offset Regulations, the entities required to implement increase offset are development activities that require EIAs and cause increases in greenhouse gas emissions. These include factories with annual emissions of over 25,000 metric tons of carbon dioxide equivalents, the construction or expansion of industrial parks, the construction of thermal power plants, cogeneration plants or the addition of generators in them, and the development of high-rise buildings.

Those required to carry out increase offsets must implement them at a rate of 10% per year for ten consecutive years, or they can choose to offset more than 10% each year and complete the offsets early. Violations of the related regulations will incur penalties. For development activities that had passed EIAs before the implementation of the Increase Offset Regulations, the *Principles for Reviewing Greenhouse Gas Emission Offsets of Development Activities* still apply.

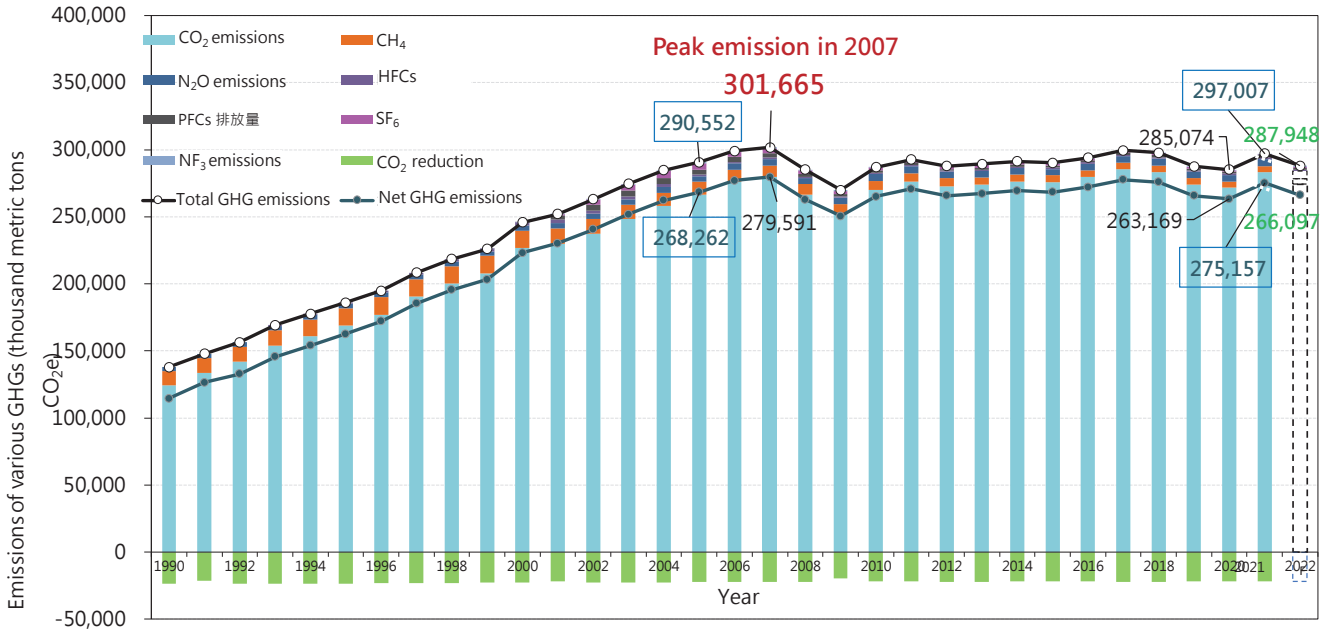
Offsets may come from the use of greenhouse gas reduction credits, replacing old vehicles with electric vehicles, replacing air conditioning, lighting, fishing vessel fish-attracting lights, old agricultural machinery, or oxygenation equipment with high-efficiency equipment, as well as the emission reduction benefits achieved beyond the specified targets through voluntary carbon reduction projects under the carbon fee collection system. Public carbon reducing actions such as vehicle replacement, agricultural and fishery machinery replacement with subsidies from the Ministry of Agriculture, or cooperation of businesses with schools, communities and other organizations in replacing air conditioning and lighting equipment are all included. Therefore, the Increase Offset Regulations enable the expansion of participation in carbon reduction for all sectors.

Based on the offsetting needs of existing developers subject to EIAs, it is estimated that there will be a demand for offsets ranging from 0.1 to 1.8 million metric tons per year in the future. Currently, there are 3.18 million metric tons of reduction benefits available to allow offsets to be carried out. The MOENV encourages enterprises and the public to collaborate in carbon reduction and facilitate offsets through trading of reduction benefits.

The MOENV emphasized the need for a diverse set of tools to promote greenhouse gas reduction, and it has announced the *Enterprise Emission Sources Subject to Inventory, Registration and Inspection of Greenhouse Gas Emissions* (事業應盤查登錄及查驗溫室氣體排放量之排放源) as well as amended and promulgated the *Management Regulations for the Inventory, Registration and Inspection of Greenhouse Gas Emissions* (溫室氣體排放量盤查登錄及查驗管理辦法) and the *Management Regulations for Greenhouse Gas Certification and Inspection Organizations* (溫室氣體認證機構及查驗機構管理辦法) in order to strengthen the system of greenhouse gas inventory, inspection and registration and manage emissions effectively. Meanwhile, the completion of the two subsidiary laws will allow a wider participation by all sectors.

Goal

By the end of this year, the MOENV will announce the drafts of enforcement rules and management regulations for the trading of reduction credits, regulations for voluntary emission reduction plans and other related regulations. It pointed out that carbon pricing is already an international trend and a key focus of Taiwan's efforts to reduce carbon emissions. By implementing the aforementioned subsidiary laws, Taiwan will gradually establish a carbon pricing system and make steady progress toward the goal of achieving a net-zero transition.



Climate Change

Power Generators and Large Manufacturers Currently Targeted for Carbon Fee Collection

Recently, much attention has been focused on the progress of the carbon fee collection plan and the formulation of relevant subsidiary laws. The MOENV pointed out that the current plan targets the power generation industry and large-scale operators in the manufacturing industry with annual emissions exceeding 25,000 metric tons. Starting from 2024, the annual greenhouse gas emissions of these industries will be included in the pricing.

The carbon fee rates will be determined by the Rate Review Committee based on factors such as the current state of greenhouse gas reduction in Taiwan, types of emission sources, categories of greenhouse gas emissions, emission scale, voluntary reduction efforts and reduction effectiveness. International carbon pricing implementation and Taiwan's industrial competitiveness will also be considered. The rates will be discussed and decided by the committee in the first quarter of 2024.

In accordance with the *Climate Change Response Act*, enterprises may apply to conduct voluntary reduction plans and be approved for preferential rates by implementing tangible reduction measures, such as switching to low-carbon fuels, adopting negative emission technologies, improving energy efficiency, using renewable energy, or improving processes. However, only enterprises that are able to effectively reduce emissions and achieve specified reduction targets can apply for approval of preferential rates. If they fail to meet the targets in a given period, they will be required to make payments to cover the shortfall.

The MOENV emphasized the need for a diverse set of tools to promote greenhouse gas reduction. It has already promulgated many bylaws to strengthen the system of greenhouse gas inventory, inspection and registration and to manage emissions effectively.

The MOENV stated that the planning for the carbon fee collection system is ongoing and the system will be implemented after extensive discussions with all stakeholders. For any questions about carbon fee collection or related issues, please contact the carbon reduction hotline at (02) 2322-2050 or email netzero@moenv.gov.tw.

Waste

RECA Assists Resource Circulation Industry in Conducting Carbon Inventories

This year, the MOENV's Resource Circulation Administration (RECA) is promoting, with the core concepts of zero waste and circular economy, the low-carbon transition of the resource circulation industry. Starting with over 700 regulated recycling and disposal businesses that handle recyclable waste, the RECA will complete a two-year program to assist these businesses in conducting greenhouse gas inventories. This initiative includes analyzing greenhouse gas emission hotspots, promoting carbon reduction technologies within the industry, establishing a carbon management model and creating green assets for the industry. The ultimate goal is to help the industry achieve a net-zero transition toward material sustainability along with manufacturing industries.

The RECA indicated that while recycling and disposal businesses are not among the first and second batches of organizations subject to mandatory carbon inventories announced by the MOENV, it had proactively decided to assist these businesses in conducting greenhouse gas inventories. This year, the RECA had organized ten briefings on organizational carbon inventory and eight training sessions for inventory personnel. These events covered topics such as global carbon reduction trends, future buyers' requirements, and how companies should conduct in-house carbon inventories and management. They accelerated the training of sustainable carbon management personnel within the

industry and helped establish the industry's own carbon inventory and management capabilities.

Based on the characteristics, processes, equipment, and raw materials (fuels) used in the waste recycling and disposal industry, the RECA has designed a customized carbon inventory tool called "Carbon Detectives" to help businesses complete reports quickly. The RECA has also collected information on relevant domestic and overseas carbon reduction technologies, and categorized and compiled it into carbon reduction technology manuals based on industry characteristics. Additionally, it has created a series of "Sustainable Carbon Management and Inventory Cheat Sheets" to illustrate simple and easy-to-understand carbon management methods, promoting carbon reduction technologies across the entire industry and enhancing sustainable carbon management capabilities.

Through these efforts, the RECA has already provided assistance to 410 recycling and disposal businesses in conducting organizational carbon inventories, helping these businesses embark on the path to carbon reduction.

Water Quality

Taiwan and India Sign Memorandum to Promote Sustainable Water Environment

On 18 September 2023, the MOENV hosted the "Promotion of Emerging Wastewater Treatment Technologies and the Taiwan-India Sustainable Water Environment Forum" at the Taipei International Convention Center, where the MOENV showcased achievements of its collaborative research and development efforts with various local universities to promote emerging wastewater treatment technologies. Also, the Water Association of Taiwan (WAOT) and the Micro, Small, and Medium Enterprises Chamber of Commerce and Industry of India (MSMECCII) signed a memorandum of cooperation, aiming to advance the wastewater industry into markets of countries under the New Southbound Policy and deepen collaboration between Taiwan and India through bilateral exchanges.

MOENV Deputy Minister Shih Wen-chen stated that in response to the global challenge of achieving net-zero emissions by 2050, Taiwan has been taking concrete actions through legislative amendments and announcements of reduction pathways while assisting enterprises in their net-zero transition. In the field of wastewater treatment, in recent years the MOENV has collaborated with local universities to promote R&D of emerging wastewater treatment technologies characterized by low pollution, low energy consumption, low cost, low space utilization, and resource circulation (4L+C). Significant progress has been made in related research and development initiatives.

"Previously regarded as pollution, wastewater is now considered a valuable resource," stated Deputy Minister Shih, who pointed out that current technologies significantly reduce the space requirements and processing costs while they effectively guide resource recycling and reuse efforts. By integrating smart cloud monitoring technology, wastewater management efficiency can be enhanced simultaneously. She further emphasized that the MOENV's perspective and approach have shifted from past end-of-pipe control to management at the source. The future direction of wastewater treatment is maximizing resource reuse and minimizing environmental impact.

At the event, 10 companies specializing in wastewater treatment equipment and smart cloud monitoring were invited to demonstrate their innovations. Take, for example, the packaged treatment system for ammonia nitrogen wastewater, which integrates film capacitors in ammonia nitrogen treatment technology, as well as ammonia nitrogen gas extraction and recycling technology. This system significantly increases concentrations of ammonia nitrogen in wastewater, facilitating its subsequent conversion into liquid ammonia and ammonium salts for reuse as raw materials. This resource-oriented approach replaces the traditional method that treats the substance as a pollutant and holds significant potential. Already some semiconductor enterprises are showing keen interest in adopting

Deputy Minister Shih Wen-chen (middle front) and Indian representatives visited the exhibition venue

such technology. Furthermore, the application of catalytic oxidation-reduction technology and bio-ball technology has yielded practical results. An enterprise in Hsinchu Science Park has already employed in its factory catalytic technology to treat the high-concentration organic nitrogen wastewater generated by detergents, reducing operational costs and occupied space by approximately one-third compared to the traditional chemical methods. Bio-ball technology has been applied in treating domestic wastewater in a technology park and also wastewater from stainless steel production in the Changhua Coastal Industrial Park. It has resulted in an 80% reduction in sludge volume compared to the traditional biological treatment with the addition benefits of reducing space and processing costs, demonstrating its commercial value.

The focus of this forum was the collaborative exchange on water quality protection between Taiwan and India. The MOENV invited experts from India's Ministry of Housing and Urban Affairs to deliver keynote speeches on opportunities in India's water, wastewater, and smart systems, as well as how Taiwan can assist in achieving sustainable development goals. Additionally, among the forum invitees were three senior executives from Delhi State Industrial and Infrastructure Development Corporation (DSIIDC), who were interested in the feasibility of applying Taiwan's technologies and equipment to improve wastewater treatment facilities in 15 industrial zones in the Delhi region.

The MOENV stated that Taiwan and India began to engage in exchanges in the field of wastewater treatment in 2017. Taiwan possesses highly mature wastewater treatment technologies, and local companies have been actively visiting India to share their experience and develop initiatives. This forum witnessed the signing of a memorandum of cooperation between the WAOT and the MSMECCII, setting a solid foundation for mutual cooperation. Both organizations will jointly promote wastewater treatment technologies and work toward achieving net-zero carbon emissions.

Air Quality

Latest Air Pollution Inventory Shows 19% Reduction Compared to Last Edition

On 15 September, the MOENV published on its official website (https://gov.tw/oU4) the 2021 report in the Taiwan Emission Data System (TEDS), an inventory of air pollution emissions. It shows that the emissions of major air pollutants have decreased by nearly 19% compared to the previous report (reference year 2019). When comparing the monitoring data for fine particulate matter ($PM_{2.5}$), the annual average concentration has also decreased from 16.2 mg/m^3 in 2019 to 14.4 mg/m^3 in 2021. This indicates that the joint efforts of the central and local authorities in promoting air pollution control measures have been effective.

The latest emission inventory (TEDS 12) shows a continuous decrease in major air pollutants. Among them, $PM_{2.5}$ emissions have decreased by 23.5%, sulfur oxides (SOx) by 19.6%, nitrogen

oxides (NOx) by 17.7%, and non-methane hydrocarbons (NMHC) by 19.2%. Moreover, the emission inventory used to be updated every three years in line with the practice of advanced countries such as the United States. However, with improved operating methods, it can now be updated biennially.

The MOENV provided the reasons for the reduction in air pollution emissions in 2021. The main reasons include the continued implementation of air pollution control programs and the impact of the COVID-19 pandemic, which resulted in some changes in economic activities. In the industrial sector (point sources), even though there was a 7% increase in energy consumption and a 9% increase in the number of regulated factories in 2021 compared to 2019 due to the increase of overseas business orders shifting to Taiwan, the major air pollution emissions still decreased by 8.5% from those of 2019. This reduction is attributed to cross-ministerial promotion of boiler improvements (2,502 units) and improvements in state enterprises, such as Taiwan Power Company, as well as stricter control measures.

In the transportation sector, in 2021, due to the increased demand for logistics and transportation during the Level 3 pandemic alert, the total mileage of diesel trucks increased by 5%. However, there was a 7% reduction in the mileage of private cars. In addition, the MOENV's efforts to replace old diesel vehicles (24,000 vehicles) and old motorcycles (1,298,000 vehicles) have yielded significant reduction results, leading to a 26.5% decrease in major air pollution emissions.

As for other types of air pollution, in 2021, the total area of construction projects increased by 46% compared to 2019, leading to increased pollution. However, in 2021, the MOENV tightened the regulations in the *Management Regulations for Construction Project Air Pollution Control Facilities* (營建工程空氣污染防制設施管理辦法) and enforced stricter limits on the sulfur content of marine fuel. It also promoted the use of straw-degrading fungi, reduced burning of joss paper by 10%, and provided guidance for kitchen smoke improvement in the food industry, resulting in a reduction of 23% in major air pollution emissions.

The MOENV emphasized that while there has been a trend of reduced air pollution emissions in recent years, achieving further reductions is becoming increasingly challenging. In addition to the implementation of the first phase of Air Pollution Control Program (from 2020 to 2023), which has resulted in improved air quality after the pandemic, the ministry has formulated the second phase of the Air Pollution Control Program (from 2024 to 2027), which is currently under review by the Executive Yuan.

International Cooperation

Taiwanese and German Experts Discuss Transition Toward a Net-Zero Lifestyle

In order to facilitate Taiwan's transition toward a zero-waste lifestyle and align with international standards, the MOENV and the German Institute Taipei jointly organized on 25 October the *2023 Taiwan-Germany International Seminar on Transition Toward a Zero-Waste Lifestyle*. Experts and industry representatives from Taiwan and Germany were invited to share relevant ideas so as to enhance promotion and implementation of lifestyle changes. MOENV Deputy Minister Shih Wen-chen, Director of the German Institute Taipei Hubertus von Morr, and Mariana Nicolau, Senior Project Manager from the Collaborating Centre on Sustainable Consumption and Production (CSCP) in Germany, launched and attended the seminar.

The MOENV stated that CSCP Senior Project Manager Ms. Nicolau was invited to share experiences in promoting lifestyle changes, aiming to raise public awareness of green living and facilitate discussions on the practical aspects of lifestyle transformation.

Ms. Nicolau pointed out that merely disseminating knowledge is not enough to change people's behaviors because of the numerous obstacles in transforming knowledge into action. Therefore, it is necessary to employ effective communication, understand the

needs of various groups, and identify motivations for behavioral change for implementation of suitable strategies, environmental infrastructures, and incentives. Also, sharing with friends and family can significantly facilitate changes in the public's habits. Additionally, General Manager Yvonne Tsai of O'right, a cosmetic company in Taiwan, talked about how her company makes use of internal workplace design to help guide its employees to adopt changes. For instance, its efforts in promoting the use of electric vehicles among employees include reserving dedicated parking spaces specifically for electric vehicles and placing them in a close proximity to the clocking-in machine. Furthermore, foot-operated faucets are installed in the company's restrooms, replacing sensor-activated ones that rely on continuous power, hence lowering energy consumption.

On issues related to a circular and sharing economy, Dr. Chen Hsien-ting from Merck KGaA shared his company's use of smart liquid crystal windows to control indoor temperatures and lighting for energy efficiency. In terms of corporate governance, the corporation has introduced smart manufacturing and promoted science education, utilizing plastic waste to make stationery items. Furthermore, Dr. Tsou Wen-po from Taiwan Toy Library Association shared their approach that is similar to how a library operates. Unneeded toys are collected, arranged, and made available to children in disused spaces in schools, as well as brought to disadvantaged kids in remote areas by a van that also serves as a mobile toy shop. Moreover, Chang Yu-chin Taiwan branch manager of EPEA, a German design company that subscribes to the cradle-to-cradle idea, shared its design concept. He spoke about how to use good product design to achieve a circular economy, such as disassembling materials like plastic or glass for reuse in the manufacturing process, and extending producers' responsibilities through a circular recycling system.

As for goals and strategies for transition toward a zero-waste lifestyle, Dr. Laura Spengler from Ökopol Institute in Hamburg, Germany, mentioned that the German Federal Environmental Agency (UBA) provides the public with a personal carbon emission calculator. The UBA also promotes carbon reduction actions through posters, graphics, and website information. Additionally, Engineer Sun Po-ling from the Industrial Technology Research Institute spoke of their efforts to develop a preliminary framework for calculating personal carbon emissions in Taiwan by studying indicators of individual carbon reduction currently used abroad. This framework includes case studies related to diet, travel, and lifestyle, serving as a reference for facilitation of lifestyle transformation policies.

This seminar facilitated discussions among representatives from NGOs and enterprises in both Germany and Taiwan on how to raise public awareness of green living and change of habits and also experiences in promoting a sharing economy among industries. All of this will provide valuable insights for refining future lifestyle transformation strategies.

Chemicals

Training Incorporates VR and Simulations to Enhance Response to Chemical Incidents

The MOENV's Chemicals Administration (CHA) has introduced a virtual reality integration of chemical Incident all-around training for the first time. In collaboration with the Industrial Technology Research Institute (ITRI), they have developed a virtual reality (VR) training module and the extended reality simulation module. The two modules encompass a total of 20 response training scenarios and 30 instructional training courses. Installed on mobile vehicles, these modules can provide on-the-move, specialized training and testing for toxic chemical disasters and help enhance enterprises' capabilities in responding to incidents involving hazardous chemical substances.

The CHA Director General Hsieh Yein-rui pointed out that, with over 4,400 enterprises in Taiwan engaged in handling toxic substances and hazardous chemicals, effective disaster prevention and response requires collaboration between the public and private sectors. Currently,

Air leakage prevention operation of the visual simulation training module

there are two consultation and monitoring centers as well as 10 technical teams specialized in toxic chemical disaster response across Taiwan. They are manned by 194 professionals who stand ready 24/7 to provide consultations and dispatch specialists to the scene within one hour of a toxic chemical incident. Furthermore, they engage in preliminary onsite response on the frontline by coordinating with firefighting units and enterprises' response personnel, which has been crucial for the decrease of toxic chemical incidents over the past two years. As of July this year, there were 5,521 registered professional response personnel in various enterprises, as legally mandated. Currently, 12,771 individuals have completed the required training.

The CHA and ITRI have utilized simulation training and VR technology to create a database of past toxic chemical disasters in Taiwan for training purposes. To enhance enterprises' capability by learning from past response experiences in simulated scenarios, the simulation training modules replicate common industrial components such as valves and pipelines using 3D printing technology. These custom-made transparent pipelines and valves allow trainees to understand their operational mechanisms. Trainees can observe the flow of gases and liquids in real time, and also the dispersions of chemical gases or splashes of liquids in various scenarios that simulate pipeline leakage caused by different pressures.

Utilizing the latest technologies such as mixed reality, augmented reality, and VR, both the VR training module and the extended reality simulation module began to be developed in 2020 and have been progressively deployed in public sector training since 2022. The VR training module features various accident settings in different venues, including high-tech factories, petrochemical plants, warehouses, and transportation premises. Simulated scenarios include fires, explosions, and pipeline leakage, all of which can also be combined to closely resemble real-life accidents.

The CHA indicated that the toxic chemical disaster response training programs initially only targeted toxic substance-handling enterprises listed for control, government agencies, and professional technical teams. In response to the recent organizational restructuring, such programs have been further carried out in training for enterprises that handle hazardous chemical substances, such as high-tech factories, petrochemical plants, and warehouses. A minimum of 30 sessions, involving 2,000 participants in total, are conducted every year. The programs will be promoted during nationwide and regional toxic chemical disaster drills, on National Disaster Prevention Day, or at major events to enhance awareness. The CHA will foster collaboration among industries, the government, and academia so as to improve prevention of and response to toxic substance and hazardous chemical Incidents while emphasizing proactive measures to always be at the ready. The goal is to continually enhance Taiwan's training capacity for disaster response to safeguard

people's lives and property.

These two modules include a total of 20 response training scenarios and 30 instructional training courses. Besides being available for training institutions, they are also designed to be mounted on vehicles and therefore allow for mobile deployment and providing enterprises with onsite training for toxic chemical disaster response. This way training sessions are no longer bound by physical locations and are strengthened in quality. Consultation visits and unannounced testing may be incorporated in the future to enhance response personnel's capabilities.

Environmental Education

Three Venues Certified as Environmental Education Facilities after Passing Review

On 30 October, the MOENV held its first environmental education certification review meeting after its organizational restructuring. The meeting was convened by Ms. Shih Wen-chen, the MOENV's first female deputy minister. Three environmental education facilities were certified during the review, including the Marine Life Propagation Station in Penghu County, the Neihu District Wastewater Treatment Plant in Taipei City, and the Kaohsiung City Seafront Water Resource Center. The MOENV stated that these certified environmental education facilities have a social responsibility to promote environmental protection, resource conservation, and environmental social and corporate governance (ESG), providing the public with enjoyable environmental education experiences in a safe and professional environment.

The Marine Life Propagation Station in Penghu County is the only facility in Taiwan that produces seaweed seedlings for aquaculture farmers. In recent years, it has been involved in coral reef restoration and facilitating cultivation of various marine organisms and resources. As part of these initiatives, it has developed related programs and courses promoting marine ecological restoration and conservation. The course on coral protection and restoration is the most distinctive one among these programs.

The next is the Neihu District Wastewater Treatment Plant in Taipei City, which primarily handles sewage from Neihu District and Dazhi neighborhood in Taipei City, as well as part of Xizhi District in New Taipei City. The plant employs a secondary biological treatment method, and after final disinfection with sodium hypochlorite, the treated wastewater is discharged into the Keelung River. With environmental education programs, the plant aims to help students understand the concept of household wastewater and its treatment process, as well as eventually raise their awareness about the importance of water resources by demonstrating production and utilization of both recycled and reclaimed water.

Finally, the Kaohsiung City Seafront Water Resources Center is mainly responsible for transforming wastewater generated from people's daily lives into reclaimed water through wastewater tertiary treatment. The final product is then supplied to corporations such as China Steel for use in their industrial manufacturing processes. Additionally, the center has developed innovative educational content using virtual reality technology, immersing the audience in a virtual journey of a small water droplet. The public is thus able to gain firsthand understanding of the importance of water resources.

The Environmental Education Certification Review Committee consists of 21 members. The MOENV's first female deputy minister, Ms. Shih Wen-chen, and Acting Director Chang Shun-chin of the National Environmental Research Academy act as the lead and deputy conveners, respectively. The rest of the committee is composed of experts and scholars, 14 of whom are representatives of non-governmental organizations and five of whom are officials from various government agencies. Facilities seeking environmental education certification must first undergo preliminary review by a subcommittee formed by members of the Environmental Education Certification Review Committee, and only those that pass the preliminary review will enter final evaluation by the entire committee.

Waste

Optimized Recycling Facilities in Kinmen Launched

The MOENV has completed the optimization project of a resource recycling storage facility in Kinsha Township, Kinmen County. The facility was launched on 12 October. County Secretary-General Hsieh Shih-chieh, on behalf of County Commissioner Chen Fu-hai, attended and presided over the inauguration ceremony, accompanied by RECA Deputy Director-General Lin Chien-san, Director Yang Chien-li of the Kinmen County Environmental Protection Bureau, and Mayor Wu Yu-chia of Kinsha Township.

The resource recycling storage facility in Kinsha Township was repurposed from an old military camp. Due to increased tourism and the subsequent rise in recyclable materials, the outdated recycling facility could no longer handle storage and sorting of recyclables in the area. Therefore, in 2022 the MOENV approved a subsidy of NT$21.38 million for an optimization and improvement project of the facility. Other than optimizing the basic environmental facilities, the project installed two additional sorting and transporting machines so as to enhance the work environment, ensure the safety of personnel, and improve operational efficiency. It is estimated that the recycling capacity has been increased by more than 30 metric tons annually.

Deputy Director-General Lin stated that the RECA strives to support personnel on the frontline and collaborate with local governments to promote recycling, following the Executive Yuan's program to improve environmental facilities of the cleaning squad. The overall program covers five major welfare aspects, including attire, transportation, access to washing facilities, housing, and safety, and the optimization and improvement project comes from the part emphasizing housing and hence aims to enhance basic recycling facilities. Since 2020, 49 projects have been approved for subsidization, totaling over NT$990 million. Completion of all these projects will result in procuring 42 recycling machines for local governments, benefiting more than 4,180 cleaning squad members, increasing annual recycling volume by over 445,000 metric tons, generating an additional annual revenue of over NT$100,004,000 from sales, enhancing more than 214,000 square meters in total, and utilizing over 44,000 tons of recycled aggregates.

Moreover, assistance has been provided to integrate regional recycling facilities. The completed Recycling and Circular Education Center in Wugu District, New Taipei City now handles recyclables from neighboring areas, processing approximately 12,000 metric tons annually. The recycling and storage facility in South District of Taoyuan City, and the local area's regional facility, still in construction, are expected to increase annual capacity by 1,000 metric tons of recyclables annually upon completion.

Looking ahead, Deputy Director-General Lin emphasized the continuous implementation of optimization projects to improve environments of recycling and storage facilities, increase recycling capacity, and support frontline cleaning squad. Efforts will also be made to encourage local authorities to attract the private sector's participation and investment in essential public recycling infrastructure projects through public-private partnerships, ensuring the ongoing and sustainable recycling initiatives.

Environmental Education

Volunteers Recognized for Environmental Efforts

On 29 October, the National Environmental Protection Volunteer Heroes Convention was held by the MOENV and Tainan City Government in Chia Nan University of Pharmacy & Science. Besides attending the event to cheer on the participants, Premier Chen Chian-jen, MOENV Minister Shieu Fuh-sheng, and Tainan Mayor Huang Wei-che also presented awards to outstanding teams in various competitions as well as 38 excellent environmental education volunteers selected by each county and city.

This event brought together nearly 2,000 environmental volunteers from 22 counties and cities. Selected through preliminary contests in their respective regions, all participants dedicated their best efforts to compete for glory on behalf of their counties or cities. The competition this year featured four categories -- Environmental Mastermind, Recyclable Sorting Champion, Slam Dunk Recycler, and Environmental Defender -- combining elements of intellect, entertainment, and teamwork. The competition was designed to be both educational and entertaining.

MOENV Minister Shieu had a lively interaction with the environmental volunteers.

MOENV Minister Shieu mentioned that, in response to global climate change, on 22 August this year the former EPA went through restructuring and became the MOENV, which now has higher goals and shoulders great responsibilities. In light of this, he expressed gratitude to the volunteers for their continuous participation and oversight of government authorities' initiatives related to environmental protection, education, and care. It is because of their dedicated efforts that various environmental tasks can be carried out smoothly and that Taiwan has become a more beautiful homeland. Minister Shieu also thanked the Tainan City Government for its full support in co-organizing this event, which served as a platform for volunteers from various counties and cities to exchange knowledge and enhance their environmental awareness.

At the closing ceremony, Premier Chen presented awards to 38 outstanding environmental education volunteers. In his speech, he emphasized the urgency of environmental protection on a global scale and Taiwan's goal to achieve net-zero emissions by 2050 through four major transitions: energy, industry, lifestyle, and society. Volunteers nationwide play a crucial role in promoting a green and sustainable lifestyle, and their active participation in environmental protection efforts is highly appreciated and respected.

At the end of the event, Premier Chen passed the convention flag to Deputy County Commissioner Yan Hsin-chang of Hualien County, which will host the event next year. Through this symbolic transferring of the environmental spirit, the organizers look forward to reuniting in Hualien County in 2024.

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