Major Environmental Policies

July 2024

1. The Green Policy Office Just Established to Integrate Net Zero Transition Efforts

The Ministry of Environment (MOENV) established the "Green Policy Office" as a task force on 20 June 2024, taking charge of integrating and coordinating the MOENV and subordinate agencies for the policy development and implementation in terms of climate change and net zero transition, while the MOENV is working together with all ministries involved for net zero and green growth actions and review on how to improve the government's efforts in climate governance.

Dr. Peng Chih-Ming, Minister of Environment, indicates that the Office is led by both deputy ministers, and the Director General of Climate Change Administration is appointed as the CEO overseeing the dispatching of workers across the MOENV and subordinate agencies who are familiar with this aspect to work under the Office. Dr. Peng stresses that cross-department cooperation is vital for many net-zero policies, including green and digital transitions in parallel, green finance, promotion of green medical care, net-zero technology applications, green leader training, and citizens' climate literacy. In addition, it is necessary to strengthen cooperation between government and private sector for low-carbon transformation, continue to stay on top of international development trends, learn from other countries for successful implementation experiences, introduce innovative policy tools in a timely manner, and increase efforts to accelerate carbon reduction.

Dr. Peng mentions that we still have a long way to go for substantial CO_2 reduction and the path to net zero. Positive efforts are needed. For this, the MOENV will provide full support for the National Council for Climate Change Strategies (國家氣候變遷對策委員會) under the Office of the President in terms of building a complete organization from the bottom up like building a better house for more efficient implementation of net zero. In response to the public concerns for the environmental impact assessment of the 4th LNG Terminal at Hsieh-ho Power Plant, Dr. Peng says that the National Council for Climate Change Strategies is established for discussion on future energy policies, and he hopes to do more on communicating with the public. For the implementation side, on the other, it all comes to professional review, and he does foresee any pressure or influence on the EIAs.

Again, Dr. Peng stresses that his experiences in the private sector tell him that the sustainable department cannot not do the job alone when a company is going for net zero. It takes the entire organization to work as a team. As such, he will play the role of CSO for the Premier and work together with all ministries to deepen the concepts of sustainability and invest practical efforts in the implementation, hopefully better matching the administrational concept of President Lai for "Green Growth Policy."

Dr. Peng, Minister of Environment, gives his speech at the opening ceremony of Green Policy Office

Dr. Peng and MOENV officials unveil the Green Policy Office plaque

The Green Policy Office will be in charge of integrating all efforts for net zero transition

2. Calling All Efforts for Pest Control

Dr. Peng Chih-Ming, Minister of Environment, was joined by the Environmental Protection Bureau, Tainan City Government for a visit at Yi-Cai Village, An-Ping District on pest control and patrol against dengue fever. HE met up with the front-ling cleaning workers and voluntary workers and provided them with personal health supplies, appreciating their efforts. He encouraged all citizens to "check," "drain," "clean" and "scrub;" check in and outside of house for any water accumulation and soiling; drain any water accumulation found; clean off containers that may accumulate water; and scrub off insect eggs attached on containers. No larvae, no mosquitoes, and no mosquitoes, no dengue fever.

The Ministry of Environment (MOENV) points out that the dengue fever is a disease spread by mosquito bites. The vectors are *Aedes aegypti* and *Aedes (Stegomyia) albopictus*. A mature mosquito can lay 50 to more than 100 eggs. These mosquitoes can be very productive as long as the environment is perfect. That is why it is important to remove anything that can become their breeding ground, including vase, pot plant tray and basement for indoor environment, and roof gutters, tree holes, scrap tires, pileups and water-holding containers for outdoor environment. These are common places where these vectors love to take a break and lay their eggs.

The MOENV provided a fund of NT$39.32 million to local governments in 2024 for breeding ground patrol and preparation of equipment and pesticides. The efforts continue to improve the prevention and control of dengue fever based on the principles of "prevent every day" and "stop from spreading". Internal inspections and competitions in counties and cities, as well as external audits, are carried out to establish basic information and positioning of breeding sources for decision-making support as an effort to identify, remove and eradicate the dengue fever breeding sources. Examples of important actions taken by central and local government for removal of breeding sources include spreading information through health education, all-out mobilization, intensified patrols on empty lots, unoccupied properties and construction sites, machine dispatching, medicine

and pesticide preparation, and the policy of no spraying unless necessary.

The MOENV once again reminded that it is the season of flooding, typhoon and torrential rain. All citizens are urged to check their living environment inside and out and remove all potential breeding sources following the four steps of “check,” “drain,” “clean” and “scrub” for lowering the density of disease vectors. Citizens are also advised to wear light-colored long clothes and pants when traveling in a foreign country, spray mosquito repellent, and avoid going to dark places to stay away from mosquito bites. This is the only to keep dengue fever and possible pandemic at bay.

Dr. Peng, Minister of Environment, takes a group photo with the cleaning team of Environmental Protection Bureau, Tainan City Government and people of Yi-Cai Village, An-Ping District

Dr. Peng visits Yi-Cai Village, An-Ping District

Dr. Peng checks a tree hole as he visits Yi-Cai Village, An-Ping District

3. Ministry of Environment X Ministry of Education; Leading the New Trends of Sustainable Fashions by Promoting Green Design

The "Nature to Future – Environmental Sustainability and Circulation Exhibition" was launched jointly by Ministry of Environment (MOENV) and Ministry of Education (MOE) from 5 June to 29 September, 2024 to help people familiarize themselves with how important resource circulation, environmental education and sustainable development are and to answer the call of the country's "resource circulation for zero waste" policy. It is a cross-departmental cooperation to promote green design and sustainable fashion, while burning the idea of resource circulation in people's minds.

Dr. Chih-Hsiu Shen, Deputy Minister of Environment, said in his speech that fast fashion has become globally popular in recent years but at the cost of many environmental issues to be reckoned with. For this, this "Nature to Future" exhibition at the National Museum of Marine Science and Technology features "circulatable" green design. The exhibition is prepared by introducing the idea of a futuristic space house instead of using non-recyclable materials such as wood and paper commonly seen in traditional exhibitions.

Organized jointly by Resource Circulation Administration MOENV and National Museum of Marine Science and Technology, the "Nature to Future" exhibition is intended to introduce all kinds of environment-friendly fabrics to the public, such as the innovative bio-membrane that is made from coffee grounds and featuring air-breathing and sweat-repelling and designed to replace undegradable chemical substances; or the effective reduction of wastewater discharge during the dyeing process by incorporating innovated cool transfer printing and the adoption of pigmented yarn for improved color fastness and reduced environmental burdens. The showcased items not only

demonstrate the possibility of resource reuse, but also inspire people for resource circulation in the daily life without depleting the precious resources on Earth. Let’s work together to weave a future of sustainable development, starting from a cup of coffee.

A part of the opening ceremony is a carefully orchestrated runway show featuring the concept of “open you closet for one less piece of clothes to buy; sustainable circulation for the Mother Earth!” with the theme of demonstrating future fashion. The curator is Mr. Jun-Liang Chen, reputed as the Godfather of Design, who introduced apparel in dynamic fashion curation and joined force with installation artist Ren Cheng and contemporary artist Chen Pu to lead their teams for a green fashion runway show on unique stage carefully designed for the exhibition at the Museum. The concept of resource circulation is incorporated in the clothing from materials to final design. For the opening "Island and Rain Dynamic Fashion Show", uses transparent white, colorful and brilliant silver to interpret the environmental story of rain, fish and abundance is interpreted in transparent white, colorful pink and brilliant silver. The three themes and 45 "sustainable fashion" designs bring fashion and environmental protection to a perfect combination, and present the first generative music runway show in Taiwan's history, allowing everyone to see the infinite possibilities of sustainable fashion, and leading Taiwanese fashion towards the international stage with the concept of green environmental protection.

The Resource Circulation Administration has not only promoted material circulation and established a control system in recent years, but also encouraged people to share resources and services through business models, extend products’ service life, and reduce resource waste. Now, the concept of resource circulation covers source management, including pre-production green design and the circular consumption model of renting instead of buying. These concepts are passed on to everyone through environmental education in the hope to achieve the goal of "zero waste in resource circulation" and drive Taiwan toward the transition to net-zero by 2050.

Dr. Shen expressed particularly his gratitude to the Ministry of Education and the National Museum of Marine Science and Technology for their efforts in promoting the concept of resource circulation and sustainability, so that the seeds of sustainable fashion will grow into the pillar of future resource circulation. In addition to this event, the MOENV is planning the fifth "2030 Beyond the Circles - Circular Economy Innovation Exhibition" in late September this year, allowing everyone for a more intuitively understanding about the concept of resource circulation and zero waste through physical display, and everyone is invited for a visit. For more information about this event please visit the "Resource Circulation Administration, MOENV" fan page on Facebook and the website of "National Museum of Marine Science and Technology".

Ministry of Environment works together with Ministry of Education to promote green design and lead the new trends of sustainable fashion

4. Ministry of Environment Renews MOU with Tzu Chi for Promotion of Environmental Sustainability

Dr. Peng Chi-Ming, Minister of Environment, and Mr. Po-Wen Yen, CEO of Tzu Chi Foundation, signed the MOU of "Clean at Source; Environmental Protection for Earth" on 5 June 2024, the World Environment Day. It is an effort between government and private sector to increase the influence of environmental education and call on the public for environmental protection.

The Environmental Protection Administration, predecessor of Ministry of Environment (MOENV), signed a memorandum of understanding (MOU) with Tzu Chi Foundation in 2020, promoting environmental knowledge to people of all ages, such as energy efficiency and CO_2 reduction, recycling and reduction from source, in multiple types of events. In addition, the Tzu Chi Taichung Jing Si Hall was certified by MOENV as a of environmental education in 2022, where interactive programs are provided for disaster prevention and rescue, circular economy and green life, thus improving the capacity of environmental education.

Dr. Peng Chih-Ming, Minister of Environment, who has been a Tzu Chi voluntary worker for years, felt honored that the he renewed the MOU with Tzu Chi on behalf of the MOENV. He was the weather anchor of Da-Ai TV for 17 years. Not just reporting weathers, he gave many speeches at several voluntary worker stations, communicating with people face to face for positive influence. For years, Dr. Peng has been the Tzu Chi's climate change consultant in COP conferences. He knows how much Tzu Chi can do in the world as an NGO.

Mr. Yen, CEO of Tzu Chi Foundation. Pointed out that the cooperation in the last 4 years was focused mostly on spreading the ideas of environmental protection and net zero. For this renewal, more contents were added, such as reduction of cigarette butts; i.e., the environment can be cleaner and

impacts on the environment can be reduced by asking smokers not to litter cigarette butts and filters. Mr. Yen confessed the he had no idea why something as small as cigarette butts can be such a big threat to the environment, since cigarette butts are a rare sight when Tzu Chi is involved. Tzu Chi is not only going to ask its members to quit smoking for reduction from source, but also spread the idea that cigarette butts can be harmful to the ocean and marine ecology.

The most previous resource of Tzu Chi is its powerful energy emitted by its voluntary workers, as added by Mr. Yen, and Tzu Chi will continue to work with the government policy of net-zero transition to promote net-zero green life from how we eat, wear, live, travel, entertain and buy as an attempt to change people's life styles and live a low-carbon life. In addition to continuous promotion of resource classification and recycling, Tzu Chi will strengthen reduction from source, promote green design and green consumption, encourage circular economy and have it practiced in people's daily lives. It is hoped that the government and the public work together to excite a crowd-building effect to drive more people to pay attention to climate actions, protect the environment, and jointly promote environmental sustainability.

Tzu Chi and MOENV renews the MOU

Honored guests at the ceremony of signing of MOU between Tzu Chi Foundation and MOENV

5. Connect SRF management to the world; Ministry of Environment is developing a consultation group for business operation checkup, as it is everybody's responsibility to protect the environment

A public concern arose as 3 SRF operations were chosen at the Taoyuan Environmental Protection Technology Park. As the agency in charge of environmental protection, the Ministry of Environment (MOENV) expresses that they are planning to establish an SRF consultant group for full-scale checkups and industrial consultation for SRF manufacturers and users. The group is intended to identify potential issues and come up with viable solutions. The local government needs to have the ability to deal with wastes within their own jurisdictions, while asking all new plants to comply with all applicable regulations for issuing a permit. On top of that, it is necessary to communicate with the public and uphold environmental justice. Local governments may punish companies that fail to comply with environmental protection laws.

The conversion of wastes into useful resources is one way for Taiwan to reach net zero. Taiwan has started the conversion of combustible wastes into fuel by studying the development trends in advanced countries like EU and Japan. For better management, the MOENV amended the "Technical Guidelines and Quality Specifications for Manufacturing Solid Recovered Fuel (固體再生燃料製造技術指引與品質規範)" again on 22 March 2024 for intensified material source management. Our own SRF quality standards are established based on ISO standards, and a product classification system developed. Manufacturers are subject a 3-stage technical review (document review, field visit and trial run), and a mechanism for joint review by central and local governments are created to improve review quality and ensure that manufacturers have the ability to produce SRF. For the

manufacturing of SRF, scrapped paper, plastics, wood and other non-hazardous and combustible wastes are selected from assortment of wastes, and subject to purification and homogenization before being converted into solid recovered fuel (SRF) complying with quality standards. The source of materials, manufacturing process and where the products are sold to are scrutinized for compliance with requirements. The SRF products are supplied for boilers fueled by coals, which not only solves the headache of increasing quantity of wastes, but also replace the use of coal for CO_2 reduction.

The public, on the other hand, has doubts about the deterioration of air quality that may come with the use of SRF. For this, the MOENV is working to review and integrate the regulations involved and specifies strictly that the facilities for which the use of SRF is permitted are fluidized bed boilers, rotary cement kilns or power generators complying with the Regulations for Installation and Management of Renewable Energy Generation Equipment, and the facilities in question shall be equipped with pollution control against dioxin, particulate matters, sulfur oxide and nitrogen oxide. For the SRF users at the same time, the dioxin criteria will be tightened and frequency of regular inspections increased based on European and Japanese standards. The relevant regulations are expected to be developed by the end of June 2024 for intensified control on the air pollutant emissions by SRF users and reduced impacts on air quality.

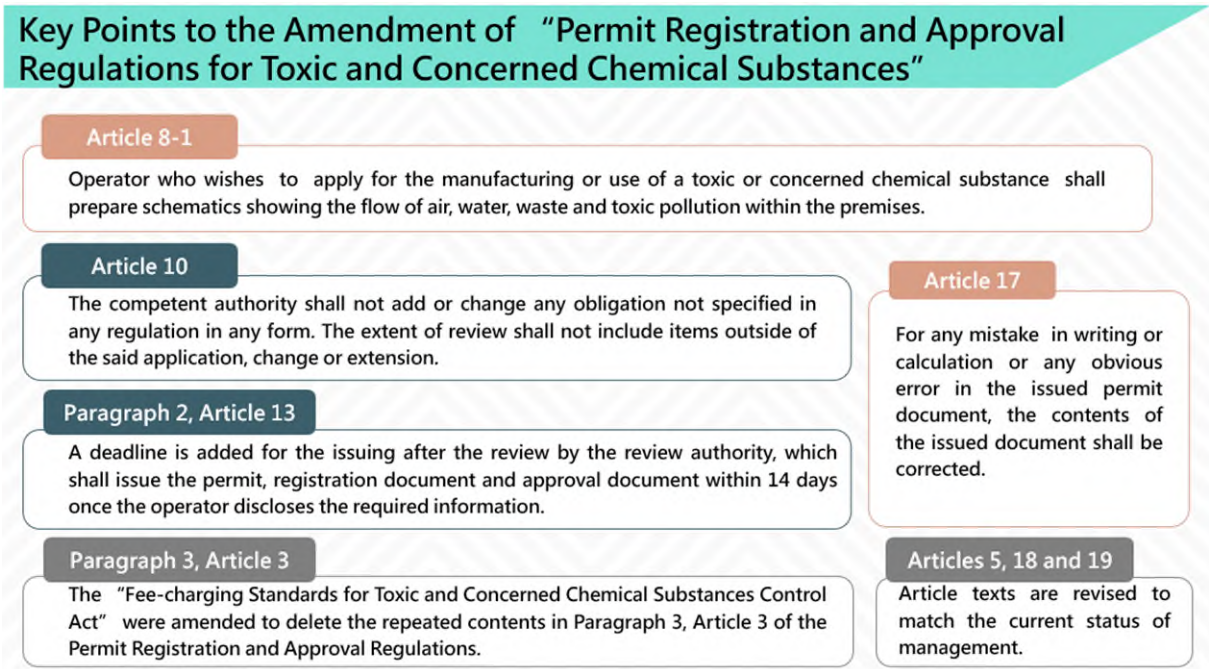
The MOENV points out that the SRF management needs to follow its position in the world, and a sound management solution established for manufacturers and users to follow the applicable regulations. The MOENV is planning to assemble the “consultation group for SRF operation checkups” to run a checkup on and provide industrial guidance for SRF manufacturers and users, and help them identify potential issues and ultimately advise improvement solutions. For the time being, the focus is on providing industrial guidance, diagnose problems and provide solutions and checkup reports; and for the long run, the goal is to examine the dynamics and benefits of SRF operations, propose a white paper on SRF development, and help businesses with the establishment of an alliance for a good development environment for SRF to turn waste into energy.

6. Ministry of Environment Announces Amendments to “Permit Registration and Approval Regulations for Toxic and Concerned Chemical Substances”

To promote the integration of environmental protection permits, improve management efficiency and reduce administrative work, the Ministry of Environment (MOENV) added stipulations that new applications, changes, alterations or extensions involving other types of environmental protection permits (documents) shall be submitted at the same time, along with other requirements such as the principles of review by municipal and local competent authorities and the deadlines for issuing permits.

The MOENV stated that the amendments to the "Permit Registration and Approval Regulations for Toxic and Concerned Chemical Substances" were designed for the integration of various environmental protection permits, where factory operators have to prepare and submit drawings indicating the flows of air, water, wastes, toxic and concerned chemical substances of entire sites before applying for, changing or extending permits for manufacturing or using toxic and concerned chemicals, registration documents and approval documents. The same shall apply to applications, changes, alterations or extensions involving other types of environmental protection permits (documents).

To improve the overall management efficiency of toxic and concerned chemical substances, another amendment stipulates that upon the approval of municipal or local governments, and after an operator submits the approved permit, registration document and approval document as required, the review agency shall certify and issue the permit, registration document and approval document within 14 days.



Summary of Amendments to the "Permit Registration and Approval Regulations for Toxic and Concerned Chemical Substances"

7. Ministry of Environment Publishes Amended Guide for Greenhouse Gas Verification to Ensure Quality of Verification Bodies

A number of mechanisms and requirements, such as carbon fee collection and intensified voluntary reduction, were established in response to the amendment of the *Climate Change Response Act* (hereinafter the Climate Act) on 15 February 2023. These are part of the foundation for the reduction of greenhouse gas (GHG) emissions in Taiwan, and the requirements in this regard are generally being tightened around the world. The latest amendments to the guide are intended to strengthen the requirements for independence and impartiality of verification bodies and their workers. A code of ethics has been added for verification bodies in addition to minor adjustments based on the changes in the inventory and verification sub-laws. The purpose is to guarantee the reliability and credibility of Taiwan's inventory and verification data as the basis of the nation's carbon pricing mechanism and the force driving progress toward the national goal of net-zero by 2050.

The guide was amended in three aspects: new requirements for impartiality and independence of GHG verification bodies; a code of ethics and relevant courses for these bodies, and; principles to follow for verification. These are described below.

(1) Improve the fairness and independence of GHG verification bodies

Verification bodies shall perform greenhouse gas verifications as a third party from a detached

position. Thus, this amendment is focused specifically on the code of practice for impartiality and independence. It has been added that a verification body shall have no affiliation with the entity being verified; also, a verification body that is a non-profit corporation shall not verify its sponsor(s). In order to maintain the impartiality and independence of the verification body, personnel performing verification tasks shall not have nor develop close personal relationships with important workers of the entity being verified, which produces greenhouse gases and data on production processes.

(2) Eliminate confusion around courses for GHG verification personnel

Some entities have misleadingly publicized that they offer programs leading to accepted qualifications as GHG verification specialists. To deal with this, a code of ethics has been added in Chapter 1 of the amendment stating that training programs provided by verification bodies must be designed to prepare trainees to become professional verification specialists, however they will not be permitted to publicize that trainees will become legal verification specialists after receiving a certificate for completing their training programs.

(3) Specify GHG verification procedures and improve GHG verification quality

This amendment to the guide is based on that of the “Regulations for Management of Inventory, Registration and Verification of Greenhouse Gases”. It defines the scope and parameters of verification, determines emission coefficients, examines heat values and sources of carbon, and adds key points to be covered in the verification report. Also added are principles for case splitting in *ad hoc* verification cases, and definitions for the size of micro and small voluntary reduction projects.

The MOENV pointed out that the amendments will take effect on 1 January 2025 to allow ample time for enterprises to prepare for the new regulations on GHG verification. These amendments to the guide aim to serve as a technical basis for verification bodies in their operations, helping them maintain and then improve the quality of verification, and gradually improve Taiwan’s GHG verification management system.

Guide for Greenhouse Gas Emission Verification, amended and promulgated by the Ministry of Environment

8. Environmental Management Administration Introduces E-tracking for Pollution Prevention to Replace End-of-Pipe Management

To improve the efficiency of environmental law enforcement and effectively deal with environmental pollution problems, the Ministry of Environment's Environmental Management Administration (EMA) has introduced E-tracking, a digital technology tool for environmental tracking and analysis, which is combined with IoT, AI identification and data analysis to discover in a timely manner suspicious pollution sources through data analysis, thus helping to proactively deal with pollution problems immediately and reduce the occurrence of major pollution incidents.

In recent years in Taiwan, there has been an annual average of 270,000 public nuisance reports related to pollution, equivalent to one report every two minutes. The number of reports remain high and there are not enough inspectors to deal with them all. On top of that, environmental crimes have been evolving with increasingly sophisticated plots, making it more difficult for inspectors to trace where pollutants come from and to obtain evidence.

To solve the new difficulties faced by law enforcement, the EMA introduced the E-tracking tool. With

this tool, the currently established environmental law enforcement information system is accessed for digital applications and for use in data analysis, thus enabling law enforcement personnel to more efficiently use manpower, time and materials for inspections. For example: visual analysis tools are developed and used to monitor pollution hotspots; a license plate AI recognition system is set up to instantly trip an alert whenever suspected illegally abandoned vehicles are spotted; and data on listed companies are collected and integrated in one single system to handle data on enterprises and facilitate broader investigations and analysis of data on suspected illegal operations.

Statistics from the EMA suggest that the introduction of the E-tracking tool has been effective. The number of public nuisance reports regarding pollution dropped from 279,383 in 2021 to 264,315 in 2023, a decrease of 15,000. Concurrently, despite limited inspection manpower, the number of violations found and fines issued by every inspector increased year by year. From 2021 to 2023, the number of violations found per inspector increased from 98 to 188, and the average amount of fines issued per inspector rose from NT$657,000 to NT$799,000. The statistics also indicate the effectiveness of the new license plate AI recognition system, installed to apprehend commercial waste disposal vehicles that fail to operate as they normally should, in violation of Subparagraph 3, Paragraph 1, Article 31 of the *Waste Disposal Act*. The number of violations discovered increased from 28 in 2023 to 83 in the first quarter of 2024. Clearly, the new law enforcement tools have improved the efficiency of inspections.

The EMA stated that the introduction of E-tracking represents a transition from end-of-pipe inspections to preventive management that reduces environmental pollution at source. The EMA continues to monitor 24/7 to prevent pollution and enforce environmental laws.

Environmental Management Administration staff introduce E-tracking for pollution prevention to replace end-of-pipe management

9. 2024 World Environment Day Promotes “Less Plastics for Better Health”

Health starts from eating locally, in season, and with no plastics! Lining up with the 2024 World Environment Day theme of “Land restoration, desertification and drought resilience”, the Ministry of Environment (MOENV), joined by local environmental bureaus and residents, held an event on 1 June 2024 at the Peng-Shu Forest Park in Douliu, Yunlin County, entitled “2024 World Environment Day – Less Plastics for Better Health”. A series of interactive displays and games helped members of the public better understand the close relationship between land and food, and the impact of plastics on health. Taking care of one's own health and cherishing the earth's resources start with green living in daily life, and reducing plastics is a part of this. The event also encouraged everyone to work together towards 2050 net zero goals.

Promotional displays, games and hands-on demonstrations were arranged at the event to help members of the public learn in a lively and interactive way that choosing seasonal and local ingredients reduces the use of plastic packaging materials and reduces carbon emissions from transportation. There was a booth for borrowing environmentally friendly tableware, allowing the public to immediately experience how to reduce plastic and eat healthily. The local food ingredients were fresh, delicious and nutritious. The stage area featured a series of musical performances, picture books and musical story presentations, with the theme of "plastic reduction and food conservation". Short and interesting musical stories helped adults and children understand that changes in every aspect of life can contribute to plastic reduction and food conservation. All are encouraged to change their habits and love the land and the planet.

Booths such as ones titled "The Plastics You Must Know" raised awareness of plastics, the environmental and ecological impacts caused by carelessly throwing away plastic wastes, how to take action to reduce plastics and environmentally friendly handmade products. There was also a "Reduce Plastics and Eat Local" market area, featuring Ministry of Environment booths promoting "Green Food", "Green Tourism", and " Reporting Public Nuisances". In addition, an anti-corruption booth was set up to demonstrate government integrity to the public through interactive games, and to deepen the public's understanding of an honest and capable government through education and entertainment. Meanwhile, local environmental protection agencies from 19 counties/cities presented seasonal high-quality, environment-friendly produce from various places, including banana and fruit vinegar from Qishan, Kaohsiung City, organic fruit and small vegetable potted plants from Yunlin County, and NG beef jerky and NG Gong Tang candy from Kinmen County. "Dapu Community, Gukeng Township" in Yunlin County, which won the 3rd National Environmental Education Award Local Preliminary Excellence Category, and 111-year-old "Cuozai Community, Lin Nei Township" in Yunlin County, which won the Green Cuisine Championship in 2022, were invited to demonstrate the use of seasonal, local, and premium ingredients to make dishes not only good for health, but that also reduce harm to the environment from plastic waste.

Prior to the activities that day, in early June 2024 the MOENV held the online sharing activity of "Plastic Reduction for Me", inviting the public to join the action of "Plastic Reduction for Me, whether you and I, how small a good deed is”. All who love the earth are welcome to follow the "Ministry of Environment Facebook Fan Page" and reduce plastics for the sake of our common environment.

Publicity ceremony for 2024 World Environment Day – Less Plastics for Better Health

Dr. Peng, Minister of Environment, delivering a speech at 2024 World Environment Day – Less Plastics for Better Health

Environment Minister Peng visited the promotional booths

Environment Minister Peng and Dapu Community Development Association, Gukeng Township, Yunlin County promoted local seasonal produce

10. Post-COVID GHG Emissions Dropping in Taiwan in Contrast to Global Trend

To align with the most recent international specifications, the Ministry of Environment (MOENV) worked with relevant departments to develop the "National Greenhouse Gas Emission Inventory (2004)" (hereinafter the GHG emission inventory) according to Article 13 of the *Climate Change Response Act*. The inventory was published on the "Open Climate Information Platform" on 25 June 2024. It shows that Taiwan's 2022 GHG emissions were 285.97 million tons of carbon dioxide equivalent ($MtCO_2e$). After deducting 21.83 $MtCO_2e$ to account for carbon sinks, the net GHG emission was 264.13 $MtCO_2e$, a decrease of 4.07% compared to 2032 and 1.77% compared to the base year of 2005. The inventory data reflects that Taiwan has been doing its part in energy transformation and GHG reduction in every department. Taiwan has gone a long way regarding GHG reduction, in contrast to increased post-COVID GHG emissions around the world.

The following are the key points of this GHG emission inventory:

(1) Attachment 1 of the United Nations Framework Convention on Climate Change (UNFCCC) asks all members to submit a national inventory report (NIR) every year for the previous two years. Although not a UNFCCC member, Taiwan has produced its own NIR every year, adhering to the IPCC Guidelines for National Greenhouse Gas Inventories. This year, Taiwan decided to follow the resolution of UNFCCC COP27 and adopted the global warming potential (GWP) values in the 5th IPCC assessment report for the inventory.

(2) Taiwan's historic record of total GHG emissions shows that its emissions peaked in 2007 then started a decline to 2020. Despite the increase in 2021 as the economy revived after the COVID pandemic and as power consumption increased, the emissions took a downturn again in 2022. As for CO_2 emission intensity, in 2022 it was 0.01191 $kgCO_2$/NTD in 2022, a decrease of 5.62% compared to 2021.

(3) The complete report and executive summary of the "National Greenhouse Gas Emission Inventory (2004)" are available for download at the "Open Climate Information Platform".

Post-COVID GHG emissions reached a high in 2022 globally, while emissions decreased in Taiwan.

The Emissions Database for Global Atmospheric Research, EDGAR, operated by the Joint Research Centre (JRC) of the European Commission, released the "GHG Emissions of All World Countries" report, indicating that global GHG emissions reached a record high of 53.8 $GtCO_2e$ in 2022, a 1.37% increase as opposed to 2021. In addition, the "CO_2 Emissions in 2023" published by the International Energy Agency (IEA) indicated a 1.3% increase in global energy-related GHG emissions in 2022 compared to 2021, suggesting a constant increase of GHG emissions as the economy came back to life in the post-COVID era. In comparison, Taiwan has shown a decrease in 2022 in both the total GHG emissions (3.78% less than in 2021) and energy-related emissions (3.39% less than in 2021), indicating that Taiwan has not aligned with the general worldwide trend of rising GHG emissions during the post-COVID economic rebound.

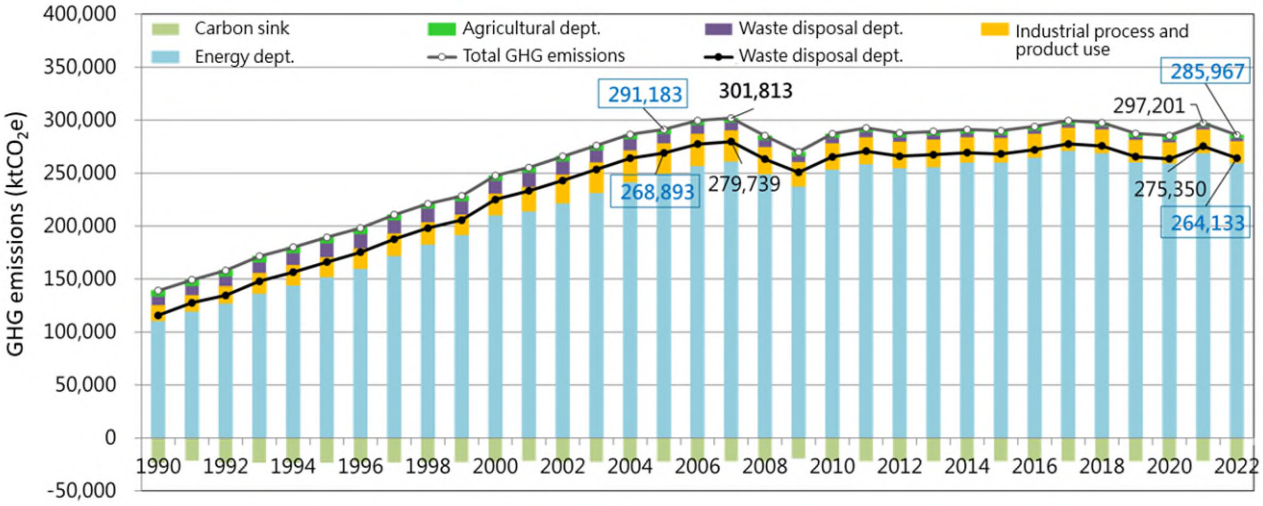
Taiwan's GHG emissions and economic growth showed a decoupling trend in 2022, placing Taiwan among the best-performing countries in the world.

In contrast to advanced countries, Taiwan displayed 2.60% economic growth in 2022 compared to 2021, a clear sign that GHG emissions and economic growth are decoupling. This suggests that

Taiwan has produced outstanding results in promoting green growth and transition to low-carbon. It has been particularly remarkable that it maintained a downward slide for GHG emissions while keeping the economy growing, putting Taiwan among countries of significant performance in this regard.

Facing the daunting task of net-zero transition by 2050, Taiwan still has to pick up the pace for CO_2 reduction.

The MOENV points out that it has been busy taking climate action in terms of legislation, systems and policy. With the promulgation of the *Climate Change Response Act* in 2023, all relevant ministries and agencies are getting involved in the 2050 net-zero path and the 12 key strategic action plans. In August 2023, the National Council for Sustainable Development revealed the annual goals for six major departments regarding improvement of the GHG management and auditing system, including an annual achievement report. In his inauguration speech on 20 May 2024, President William Lai said that his "National Hope Engineering" incorporates the five strategies for 2050 net-zero transition. The MOENV is positively promoting a carbon pricing and market system, leading the industrial sector through transition to low-carbon, and examining progress towards established goals based on the emissions inventory, thus moving toward the ultimate goal of "net-zero transition, sustainable Taiwan".



GHG emission trends in Taiwan

11. Taiwan and USA Host Asia-Pacific Regional Workshop Soil and Groundwater Remediation

Taiwan has never slowed its pace of developing technologies for soil and groundwater pollution investigation and remediation. It is always looking to introduce environmental protection technology from advanced countries to refine, improve and localize its own technology, which is how the nation maintains its leading position in the Asia-Pacific region. Thanks to the US-Taiwan Cooperation Agreement for Environmental Protection (臺美環保合作協定), the Environmental Management Administration of the Ministry of Environment (hereinafter the EMA) invited seven experts from the United States and Australia to take part in the "2024 International Workshop for Soil and Groundwater Technology in the US and Taiwan" held on 27-28 June 2024 at National

Cheng Kung University in Tainan. More than 200 international and domestic participants from governmental, industrial and academic sectors took the opportunity to learn about development trends regarding advanced remediation technologies and management strategies for internationally significant emerging pollutants.

Dr. Peng Chi-Ming, Minister of Environment, said in his opening speech that clean soil and groundwater are the basis for protecting human health and the ecosystem, as they are important to achieving the goals of sustainable development (such as SDG2 zero hunger, SDG6 water and sanitation, and SDG15 life on land). In particular, to face extreme weather events due to climate change, an array of greener, more sustainable and resilient methods and tools are needed when planning remediation solutions. On top of that, the challenges of emerging pollutants also need to be dealt with. The MOENV has started working on the investigation and management of such pollutants. This workshop provided an outstanding opportunity to share experiences with emerging trends in pollutant remediation and management and to interact with specialists in this area and with experts on how to mend the environment and keep the earth sustainable for all.

Dr. Jane Nishida, Assistant Administer of the US EPA, stated in her remarks that the US EPA has been working very closely with Taiwan's MOENV on protecting the environment since the 1990s. Dr. Nishida expressed her gratitude to the US EPA, Taiwan's MOENV, and the Soil and Groundwater Pollution Remediation Fund Management Board (ReSAG) for organizing this event. She stressed that soil and groundwater pollution has become a serious threat to human health, particularly to the socially disadvantaged, children and the elderly, and that is why it is important to improve pollution site remediation capabilities. She hoped the workshop would encourage the exchange of professional knowledge and serve to protect the environment in the Asia-Pacific region.

The MOENV stated that experts were invited from the United States and Australia for this international event held by Taiwan to share their insights on the management of emerging pollutants around the world, and how to deal with them by examining practical examples. The EMA also invited the official representatives of nine ReSAG member countries to share their knowledge about the latest remediation technology, management strategies and implementation experiences. Several experts from Taiwan were invited to interact with the international guests, bringing them quickly up to date on the latest international developments. Guests and participants quickly started discussions as soon as the workshop started.

Another aspect of the international workshop was the display of Taiwan's twelve most advanced soil and groundwater pollution remediation and environmental protection technologies, including for soil washing, which are the fruits of cooperative efforts between the MOENV, academia and the industrial sector. Experts from governmental, academic and industrial sectors demonstrated how these technologies work and the results they produce to US and Australian experts and official ReSAG representatives. While visiting the demonstration display, Mr. Shen Chih-Shiu, Deputy Minister of Environment, expressed that he was happy to see Taiwan demonstrate novel environmental protection technology at an international event, demonstrating the nation's leading position in environmental pollution investigation and remediation technology. He hoped to promote the technologies in the Asia-Pacific region, showing that "Taiwan Can Help" regional neighbors with the prevention and remediation of soil and groundwater pollution, and encourage regional cooperation for environmental protection in general.

The EMA stressed that the protection of soil and groundwater is the last line of defense for a habitable Earth. As an important actor for environmental protection in the Asia-Pacific region,

Taiwan will continue to work with advanced countries to develop green and sustainable remediation technologies and pollution prevention strategies, while sharing the results of cooperation with regional neighbors to protect soil, water and homelands.

Dr. Jane Nishida, Assistant Administer of the US EPA, Dr. Peng, Minister of Environment, Mr. Shen Chih-Shiu, Deputy Minister of Environment, and international guests

Mr. Shen Chih-Shiu, Deputy Minister of Environment, with all workshop participants

Mr. Shen Chih-Shiu, Deputy Minister of Environment, and workers at the technical presentation booth