Major Environmental Policies

February 2025

1. MOENV Preannounces Draft Regulations for Emission Sources Subject to GHG Inventory and Registration

The MOENV has expanded the scope of those subjects to inventory and registration of greenhouse gas (GHG) emission sources in order to increase and strengthen control of emission quantity. Only the inventory and registration of GHG emission, not verification, are required according to the regulations regarding classification of inventory, registration and verification under the *Climate Change Response Act* (氣候變遷因應法). Therefore, the draft of the *Enterprise Emission Sources Subject to Inventory and Registration of Greenhouse Gas Emissions* (事業應盤查登錄溫室氣體排放量之排放源) was preannounced on 9 January 2025 for public comments.

The preannounced draft lists the following enterprises under control, in total approximately 500 more subjects to inventory in estimation. They are enterprises in the service industry, transportation industry, hospitals, colleges and small and medium-sized manufacturers with high use of electricity, oil, or other fossil fuels, including information service enterprises, department stores, shopping centers, wholesale stores, railway transportation, mass rapid transportation and colleges whose annual electricity consumption reaches 10 million kWh at a single premise or 20 million kWh for the entire enterprises/school; medical centers; hotels whose annual electricity consumption reaches 10 million kWh at a single premise; telecommunications enterprises, chain convenience stores and supermarkets that own more than 100 directly-operating and contracted stores; bus companies, and tour bus enterprises and cargo transportation that operate with 200 vehicles or more. Last but not least, they include small- and medium-sized manufacturers that meet any one of the following requirements, including a single premise whose annual consumption reaches 4,000 tons for coal, 3.2 million kiloliters for fuel oil, or 5 million m3 for natural gas; a single exhaust vent whose total design or actual heat input reaches 10 million kcal/hour; or the entire factory/site which consumes 20 million kWh or more of electricity per year. Those that meet the preannounced conditions are required to complete inventory and registration of the previous year's GHG emission by 30 April every year. It is conducted by headquarters or colleges for emissions of all their subsidiaries, branch companies, branch stores, branch offices, appointed or franchise stores, branch campuses and branch departments, except for the manufacturing industry, hospitality industry and hospitals.

Regarding the concerns about additional costs to hire consultants or for verification, the MOENV points out that the expanded inventory would following the following principles, namely “No trouble, no commission, no verification, and no carbon fee collected”. The MOENV will have the inventory platform designed to interface with TaiPower’s power consumption database, with industrial commerce identification required for login. Inventory is performed only for scopes 1 and 2 and this will not

cause enterprises to have any additional cost. The MOENV has a series of workshops and training programs in place in 2025 and is now working on the inventory handbook for service industry, transportation industry, and hospitals to walk them through the inventory process without having to commission external assistance. Only inventory and registration are required, and verification is not, hence no concern regarding not finding a verification institute or additional verification expenses. At the same time, those subjects to collection of carbon fees are not included for the time being. The MOENV will recognize efforts of enterprises active in carbon reduction to encourage outstanding green enterprises.

2. MOENV Releases SRF White Book and Regulations to Tighten Controls

Three months after the release of the inspection results of 66 solid recovered fuel (SRF) enterprises throughout Taiwan in September 2024, the MOENV published the drafts of the Solid Recovered Fuel White Book (固體再生燃料（SRF）白皮書) and the *Regulations Governing Controls of Reuse of Common Industrial Waste as Raw Materials for Solid Recovered Fuels* (共通性事業廢棄物作為固體再生燃料原料再利用管理辦法) on 14 January 2025. The difference between the released drafts and preannouncement is the cancellation of Level 5 products, which are the highest in the contents of chlorine and mercury, for effective reduction of dioxin produced. The Resource Circulation Administration (RCA) indicated that the entire draft of the white book will be published online in early February. All opinions are welcomed by mid-March in hopes of finalizing the white book in April. The regulations will be released very soon to elevate their level of implementation and strengthen management of waste-to-energy conversion.

"This draft is the foundation for joint discussion. Those who are interested in this industry and those who have their doubts are all advised to read the draft before talking to us about the SRF management system," urged the MOENV Minister Peng Chih-Ming. The MOENV examined the current SRF production capacity in the white book and estimated that there is still room for growth in terms of material sources. However, all enterprises are encouraged to follow the regulations in the follow-up material disposal and to upgrade their equipment so that they meet the quality standards. At the same time, the threshold will become higher for enterprises to enter the SRF industry once the new regulations are tightened.

I. The white book reveals SRF productivity capacity and markets while the regulations tighten the standards

"We put our actions where our mouths are. We have studied SRF management around the world," pointed out Minister Peng. There is active promotion of technologies in the world that turn waste into energy. Non-hazardous but combustible wastes, such as plastics, rubber, paper, wood, fibers, animal/plant-based scraps and general wastes, are sorted, pulverized and mixed before becoming SRFs. In countries where SRF is promoted, such as EU, Japan and Korea, the materials are mostly waste plastics and rubber, as they make good SRF

materials for their high heat value and combustion characteristics. Statistics of the International Energy Agency (IEA) indicate that SRF has become an important way to convert waste into energy and is widely used in papermills, cement plants and cogeneration plants as alternative for coal, and it also enhances energy efficiency.

Taiwan has been implementing the SRF policy since 2019, forming quality specifications in 2020 and completing inspections in and aiding manufacturers and users throughout Taiwan in 2024. The future implementation focuses will be proposed after conducting analysis of the international development of SRF industry, looking into Taiwan's SRF operation status, and reviewing policy implementation. The release of the (draft) SRF White Book explains to the public the operation station and policy directions regarding SRF industry in hopes to collect public opinions for improvement of SRF controls. For issues found during the inspections and assistance, control measures are enhanced by having the Regulations Governing Controls of the Reuse of Common Industrial Waste as Raw Materials for Solid Recovered Fuels" (referred to as the *SRF Regulations* hereinafter) established in response to the public expectation on the improvement of SRF controls.

"The policy priority is still source reduction, followed by proper recycling and circulation to minimize harvests of natural resources, and finally conversion of wastes to energy provided that combustible materials meet the quality specifications," stressed MOENV Deputy Minister Shen Chih-Hsiu. Inventory documented in the SRF White Book reveals that 342,000 metric tons of materials were used by SRF manufacturers in 2024, and roughly 272,000 metric tons of potential SRF source materials have yet to be converted among all the hazardless and combustible industrial wastes. Currently, there are plans to make general waste into SRF, approximately 300,000 metric tons, in certain counties and cities. However, the complicated nature of materials from such sources and difficulty processing them will require enterprisers to upgrade their disposal capabilities to produce qualified SRFs, which meet the specified quality standards and are approved by user plants. The MOENV stressed that in the future it will continue to pay close attention to enterprises' equipment installation and operations and collect successful experiences as references for other manufacturers to promote the total enhancement and sustainable development of the SRF industry.

For dioxin that is a public concern, six requirements under the *SRF Regulations and the Air Pollution Control Act* (空氣汙染防制法) have designed the world's most rigorous standards at both the front and back ends of the SRF production. Deputy Minister Shen pointed out the three checks already in place, which are material selection, removal of hard plastics and PVCs by visual examination before production, and quality standards regarding chlorine content. To prevent generation of high dioxin after use of SRFs, the air pollution emission control standard is tightened to 0.1 ng-TEQ/Nm^3, the tightest in the world. This is to encourage SRF users to invest in pollution control equipment and demand the manufacturing end to do their best.

For the new *SRF Regulations*, the MOENV has set stricter rules in material source

control, manufacturing process, and quality standards. In terms of SRF manufacturing, the plan is to eliminate Level 5 for the contents of chlorine and mercury, leaving only four levels to lower the contents of chlorine and mercury and therefore improving product classification. A one-year buffer period is provided, given that there are still enterprises whose current contracts still cover Level 5 products. For use of SRF, currently different emission standards regarding heavy metals and dioxin apply to different enterprise types and scales. Both will be tightened and are to meet the requirements set for large incinerators. Take dioxin for example. Regardless of operation scale, all enterprises are require to meet only one flat standard at 0.1 ng-TEQ/Nm^3, tighter than before and increase testing frequency to four times per year. In addition, reuse enterprises and SRF-using factories are required to install CCTV for transparency of product whereabouts and install equipment to reduce dioxin and particulate matters.

II. Conversion of waste into SRFs with better control system

Minister Peng urged enterprises already participating and those interested in this industry to read the white book and the SRF Regulations thoroughly. The hope is that enterprises "join in because of understanding" and work together for the conversion of wastes into energy and do not choose to "walk away for failing to meet standards". He also mentioned that sources and capacity of SRF will change eventually with advancing technology. The MOENV will continue to improve the control system and allow sustainable development for compliant enterprises that meet all the requirements.

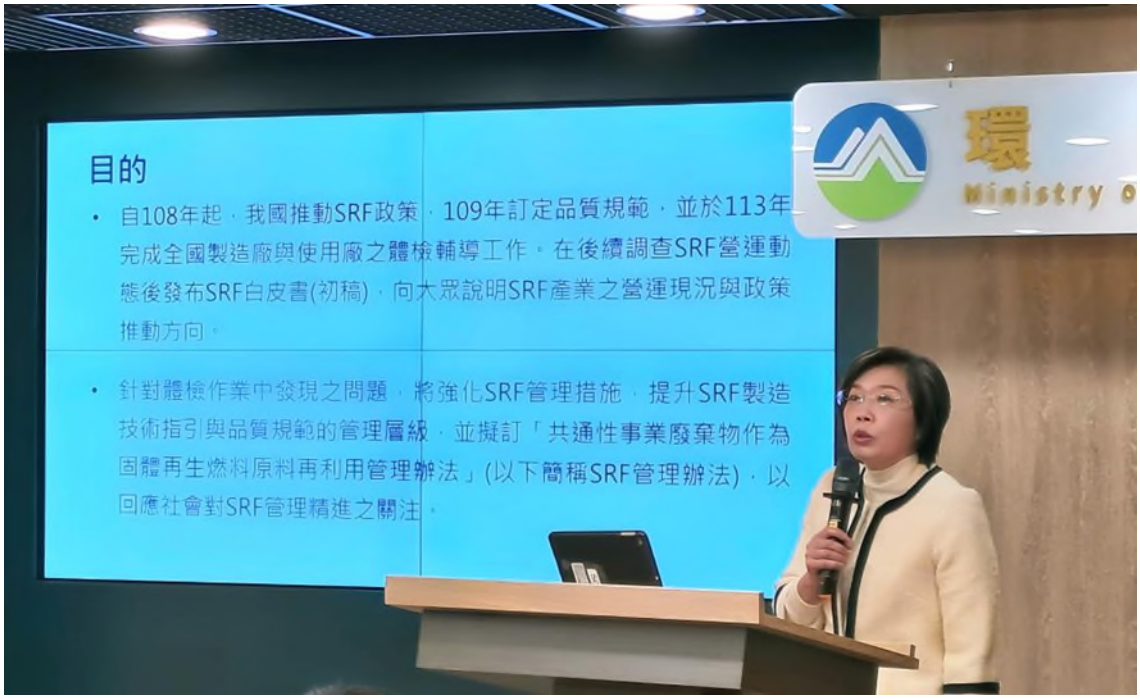
Minister Peng made it clear that the MOENV has no intension to throw a NT$10-billion Green Growth Fund into SRFs without careful consideration, saying "this is only a small industry with little production value. There are still a lot to do to encourage source reduction." Deputy Minister Shen further added that inventory of current domestic material sources and usage capacity indicates that there are more than enough to supply domestic uses, so. There is no need to worry about "importing foreign garbage", and current regulations also prevent importing foreign wastes for SRF production.

III. Opinions are collected from all sides to improve SRF control

Given the public concern surrounding the SRF policy, the RCA has set up the following website (https://wooo.tw/3BzkWM5) for information disclosure on presentations and graphics in the press conference, the white book abstract and SRF policy feedback forms. The complete draft of the white book will be released in early February. Opinions will be collected from all sides before mid-March, and answers responding to these opinions will be included in the white book as an appendix. It is hopeful, via public participation, to help improve SRF controls, maximize values of reutilizing combustible waste, and lead to a win-win development of economy and environment.

Minister Peng Chih-Ming says the MOENV will enhance SRF controls in an advanced, strict, transparent and comprehensive manner.

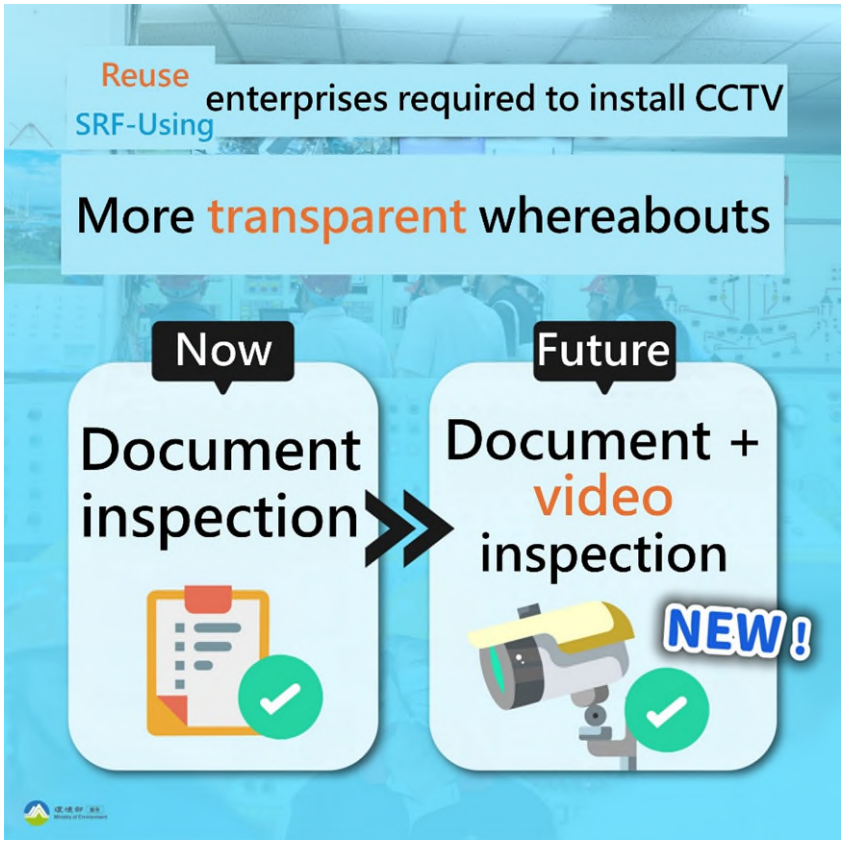
Deputy Minister Shen Chih-Hsiu explains that the priority of resource circulation starts with source reduction, followed by recycling and, finally, conversion of waste into energy with combustibility as a prerequisite.



RCA Director General Lai Ying-Ying indicates that the *SRF Regulations* focus on tightening source material controls via removal of hard PVC, establishment of third-party verification system and installation of CCTV for viewing by competent authorities.

SRF White Book - Level 5 eliminated for product types based on chlorine and mercury contents for better product classification

SRF White Book - More rigorous emission standards for heavy metal and dioxin as those of large incinerators



SRF White Book - Reuse and SRF-using enterprises are required to install CCTV for more transparent product whereabouts

SRF White Book - Better pollution control equipment for better facilities

3. MOENV Announces Amended Regulations of Water Pollution Control Measures, Testing and Registration

The MOENV released the draft partial amendment of the *Water Pollution Control Measures and Test Reporting Management Regulations* (水污染防治措施及檢測申報管理辦法) on 20 January 2025. The amendment focuses on encouragement of priority treatment for highly organic wastewaters for conversion to energy, testing and reduction of antibiotics and per- and polyfluoroalkyl substances (PFASs), encouragement of reutilization for reasonable reduction of testing and registration, and addition of zebrafish embryos as a species in toxicological testing. Details are explained below:

I. Wastewater treatment and energy conservation and generation

Conventional biological wastewater treatment is done aerobically, but it leads to issues such as large energy consumption, high emissions and massive sludge. Anaerobic treatment of highly concentrated organic wastewater generates methane that can be recycled and used as energy, which is also the global trend in wastewater treatment. For industries up to a certain scale and with energy conversion potentials, including paper making, food production, fermentation, petrochemicals and public wastewater treatment plants, the amendment has added that they are to evaluate and adopt best-available control technologies (anaerobic treatment) and collect and use methane in permit application,

modification or extension. Apart from the amendment, the MOENV stresses that planning of subsidies is underway so that those interested in reutilization and energy conversion and eligible can apply for subsidies to become demonstration sites.

II. Testing and voluntary reduction of newly emerged concerned substances

Discharge of drugs into water bodies poses a risk of hazards, and PFASs are hazardous persistent organic pollutants, so the Stockholm Convention has set limits and bans overuse of PFASs. And wastewater testing and reduction controls are in adopted for drugs and PFASs in the world. As a result, it is added in the revision that hospitals and medical centers of a certain scale, sewage systems of science parks, and enterprises whose production processes use PFASs are required to conduct annual testing and registrations. A voluntary reduction plan is to be proposed for two consecutive failures to meet the monitoring value.

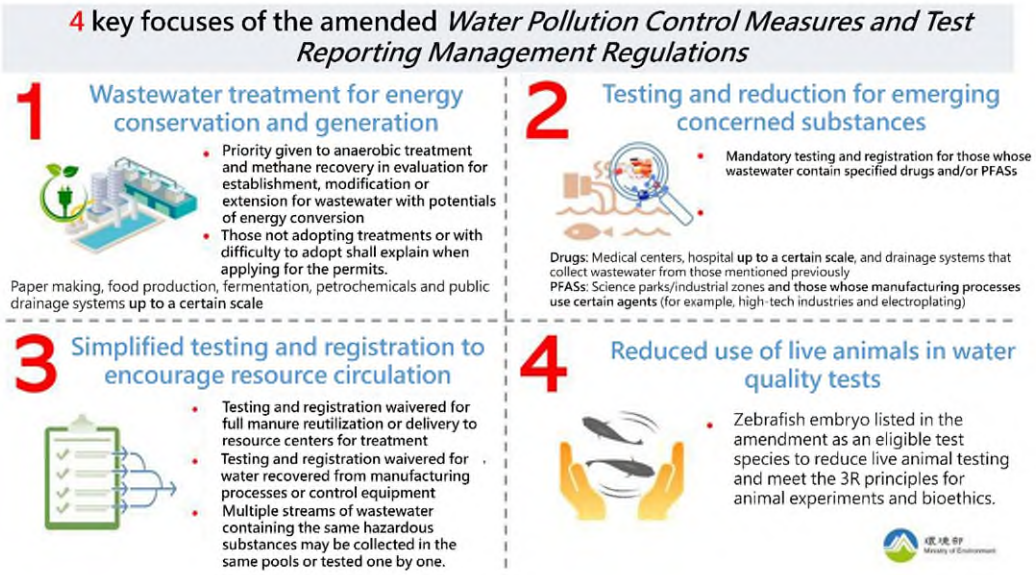
III. Simplified testing and registration to encourage resource circulation

Administration regarding registration is simplified to push manure reutilization. Testing and registration are waived for those that irrigate with animal manure in individual reuse cases or as farmland fertilizers and animal farms that either have all their manure processed by reutilization treatment centers or 75% or more of their manure reutilized themselves. Requirements are relaxed regarding types of documents mandated in the proposal of use of manure digestate, and testing and registration may also be waivered for water recovered from manufacturing processes or pollution control equipment.

IV. Reduction of live animals used in water quality tests

Originally, acute biotoxicological tests for effluents are mostly conducted with live animals, such as carps and flowerhorn cichlids. Zebrafish embryo is listed in the amendment as test species to reduce live animal testing and meet the principles of 3R (Replacement, Reduction and Refinement) for animal experiments and bioethics.

The MOENV emphasized that this amendment is in line with the international trend of carbon reduction and regulations as well as promotion of converting wastewater to energy via treatment for energy conservation and generation. Other purposes include testing and reduction of emerging pollutants to lower risks of hazards and encouraging wastewater reutilization by simplifying testing and registration processes.



4 key points to the amended *Water Pollution Control Measures* and *Test Reporting Management Regulations*

4. MOENV Announces Amended EIA Determining Standards for Development Activities and EIA Enforcement Rules

The MOENV released the amendment on certain articles and Attachment Charts 1 and 2 of Article 3 under the *Standards for Determining Specific Items and Scope of Environmental Impact Assessments for Development Activities* (開發行為應實施環境影響評估細目及範圍認定標準) on 16 January 2025. This amendment was conducted with suggestions provided by relevant agencies and revisions and announcements of relevant regulations, reviewing problems found in practical implementation. Requirements regarding environmental impact assessments (EIAs) for renewable energy are adjusted to implement effective solar power management generation, ensure both renewable energy development and environmental protection, facilitate development of renewable energies such as small hydropower and geothermal power, and encourage relevant research and development. The amendment is summarized as follows:

I. Prospecting and mining activities are to adhere to EIA regulations according to the *Mining Act* (礦業法) amended on 21 June 2023;

II. The targets exempted from EIAs for lumbering are adjusted, replacing "manmade forest plantations in lowland plains" replaced with "sustainably operated plantation forested announced by the competent authority of forestry".

III. It is added that the EIAs may be exempted for small hydropower plants whose "water quantity reaches 2 cubic meters per second or more downstream of water intake points", "whose tail water is released back to the original surface waterbodies after power generation", and that are reviewed and approved by

the competent industry authorities.

IV. **It is added that EIAs are required for solar power plants located in environmentally sensitive areas, such as national parks, wildlife refuges, natural protection areas, farmlands in specific agricultural areas, and public forestation sites, and for those located on a hill slope with an installed capacity of 20,000 kW or more or an installed size reaches 15 hectares or more.**

V. **It is added that EIAs are required for geothermal power plants located in certain environmentally sensitive areas with an installed capacity of 10,000 kW or more and size two hectares or more. Also, installed capacity is increased to 50,000 kW or more for those located in general areas.**

VI. **It is added that EIAs may be exempted for indoor substations whose straight-line distance from the boundaries to those of elementary schools, junior high schools (including designated lands) or those of hospitals reach 50 meters or more.**

VII. **It is added that EIAs may be exempted for experiment projects approved by the competent industry authorities.**

VIII. **It is added that EIAs may be exempted for small-scale urn walls or columbarium located 1,500 meters or more above sea level with the approval of the competent authority in charge of indigenous affairs and competent industry authorities.**

The *Environmental Impact Assessment Enforcement Rules* (環境影響評估施行細則) have been amended together in response to the amendment of the determining standards above, considering the fact that some development activities are local and medium or small in size with impacts that have similar characteristics and involve common environmental issues. The revised part is relevant to EIA review and division of labor of competent authorities in supervision over certain development activities, such as small hydropower plants and fishing harbors, to achieve both environmental protection and local development. The transfer of jurisdiction is scheduled to take effect on 1 July 2025.

6 key points of the amended *Standards for Determining Specific Items and Scope of Environmental Impact Assessments for Development Activities*

The announced amendment of the *Environmental Impact Assessment Enforcement Rules*

Websites with information of announced regulations

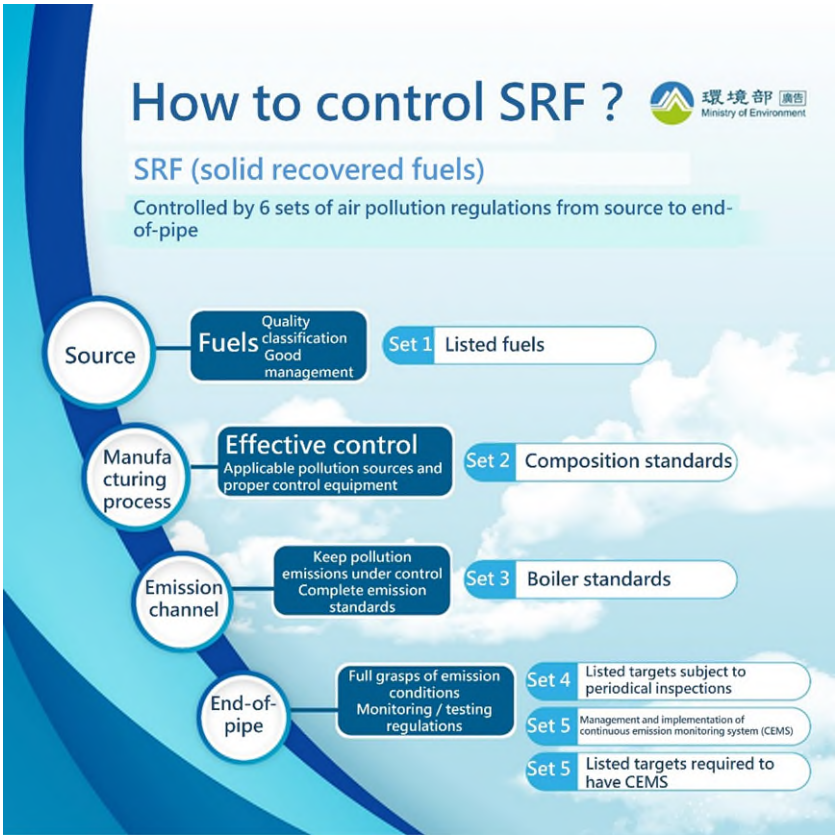
5. MOENV Promulgates Tightened SRF Emission Standards to Align with Controls

As the public is concerned about possible air pollution from the use of solid recovered fuel (SRF), the MOENV has revised and released tighter air pollution control regulations on 2 January 2025 as a practical measure for control of air pollution targeting use of such fuel. Under the conditions of feasible control technologies, the parts regarding dioxin, lead, cadmium and mercury, which are of concern about higher risks, are tightened in the *Emission Standards of Air Pollutants from Boilers* (鍋爐空氣污染物排放標準) with the EU and other countries as reference and also following regulations for large incinerators. This is to reduce the risks of environmental exposure. The remaining emission standards are already within the acceptable ranges or considered negligible risks under the USEPA's regulations for heavy metal air pollutants. The MOENV stressed that it has asked local governments to propose a 2025 enhanced inspection plan to ensure that the use of SRFs complies with air pollutant emission standards.

The MOENV indicated that the EU has different emission standards for different combustion equipment and how much fuel it uses, where the standards for particulate matters and NOx are 25~30 mg/Nm^3 and 200~300 mg/Nm^3 (equivalent to 97~146 ppm), respectively, for SRF-using equipment. The counterparts in Taiwan currently are 30 mg/Nm^3 and 100 ppm, also respectively, suggesting little or no difference. Apart from the tightened emission standards, the emission standards for heavy metal air

pollutants in the *Emission Standards of Air Pollutant from Boilers* are specified in the relevant standards for stationery pollution sources, such as the *Stationary Pollution Source Hazardous Air Pollutant Emissions Standards* (固定汙染源有害空氣汙染物排放標準). The health risk assessment and control technology feasibility study have confirmed that the risk values fall within the definition of negligible risk (<10-6), or acceptable risk (10-4~10-6) established by USEPA. The purpose of requirement pollution sources to set up automatic continuous emission monitoring system (CEMS) or periodical testing for HCl and CO is to understand combustion efficiency as an attempt to find out possible generation of dioxin and emission status. More data will be collected and studied for future reviews and tightening.

The MOENV stressed that the SRF management should involve many participants, so it is not only tightening control on the pollutant emissions from the use of SRF but also focusing on systematic source control for the quality of SRF products. Combining with technologically feasible and risk-free emission standards, the stricter product classification, more transparent product whereabouts and comprehensive facilities will help achieve the goal of practical environmental protection management.



Key points of tightened SRF control – Tightened overall control from source to end-of-pipe

6. MOENV Promulgates Regulations for Reuse of Common Industrial Waste as SRF Materials

The MOENV considers conversion of waste into energy as one of pathways to net-

zero emission and studies the global trends of converting combustible waste resources into energies. The control regulations for use of SRF materials as well as requirements regarding manufacturing technology guidelines and quality specifications in the current *Regulations Governing Reuse of Common Industrial Waste* (共通性事業廢棄物再利用管理辦法) and their appendices are integrated in order to enhance material source control, manufacturing specifications, usage management and declaration monitoring. The aim is to achieve better solid recovered fuel (SRF) control and enhance control level of manufacturing technology guidelines and quality regulations. As the result, the *Regulations Governing of Reuse of Common Industrial Waste as Raw Materials for Solid Recovered Fuels* (共通性事業廢棄物作為固體再生燃料原料再利用管理辦法) have been announced on 17 January 2025 as an appropriate response to the public concern about measures for improving SRF control.

The MOENV's Resource Circulation Administration (RCA) indicated that examination and guidance were conducted between June and September 2024, followed by a report. Improvement measures were formed for issues found during the guidance process and included in the regulations. As the draft was preannounced in early November 2024, three meetings were organized in northern, central and southern Taiwan to collect public opinions before the regulations were developed. Key points are described below:

I. **Better source control: Sources of industrial waste include waste plastics and paper generated by domestic enterprises that can be used to make SRFs, and hard polyvinyl chloride (PVC) is removed. It is specified that no debris shall be detected under visual inspection, and there are limited regarding percentage of debris under manual sorting.**

II. **New added items for online registration: Enterprises generating waste as SRF materials are mandated to register each batch of wastes, and reuse enterprises to keep a daily log and on the next month report the use, production and storage and disclose their whereabouts and quantity.**

III. **Third-party verification system: It is specified that reuse enterprises may start selling SRFs once verified and approved a third party or after obtaining documents proving their test qualification.**

IV. **Installation of closed-circuit TV (CCTV) surveillance system: Reuse enterprises are mandated to install CCTVs to make remote surveillance available for competent authorities.**

The RCA explained further that specific codes for industrial waste used as SRF will be added in the regulations. Enterprises generating waste as SRF materials and reuse enterprises are given a one-year buffer period for regulatory transition and to meet the needs of actual operations, allowing them to apply to evaluating authorities for modification of their industrial waste clearance plans.

7. Minister of Environment and Local Environmental Protection Bureau

Chiefs Aim to Resolve Exposed Garbage Problem by End of 2026

There is much public concern about exposed garbage piling up. To address this problem, the Minister of Environment, Dr. Peng Chi-Ming, invited the heads of the local environmental protection bureaus from counties and cities where there are pileups of exposed garbage. They jointly pledged and signed a declaration on cooperation to continue implementing several measures, including digital management, source reduction, resource recycling, landfill management, and reduction of packaging waste and volume. Governments at both the central and local levels will work together to deal with exposed garbage in local counties and cities once and for all by the end of 2026.

The Ministry of Environment (MOENV) pointed out that 24 incinerators started overhauls in 2017, thus diverting much garbage to landfills. As of the end of 2023, up to 840,000 metric tons of garbage were stored at exposed landfills throughout Taiwan. To help local governments deal with this issue, the MOENV planned a 3-year, NT$1.2 billion budget to help local governments sort waste, cover landfills and implement disaster prevention measures, starting from 2024.

The MOENV further pointed out that it had asked local governments with exposed garbage piles to come up with year-by-year treatment plans in 2024, which were approved by the ministry in November 2024. The target is to deal with the exposed garbage pileups appropriately by the end of 2026 through a series of measures, including landfill processing, covering with soil, re-packaging and disaster prevention measures. The Environmental Management Administration (EMA) has established the "Nationwide Exposed Garbage Pileup Processing Monitoring Platform" (https://landfill.moenv.gov.tw/Storage_map_TV.aspx) to supervise local governments to accomplish the work. Through this website one can view online how garbage is being held at exposed landfills by counties and cities and see if these sites are being improved. The EMA periodically publishes progress reports on the website on garbage processing by municipalities. Information transparency aided by digital technology helps improve public monitoring of governments and demonstrates the resolution of governments to address these garbage issues.

The MOENV stressed that garbage processing is in fact a part of local self-governance according to the *Local Governance Act* (地方制度法). The reduction of garbage from sources is the fundamental solution. The MOENV calls on local environmental protection bureaus to learn from the successful experience of Changhua County. This would involve intensifying mandatory garbage sorting and inspections for broken bags, the implementation of a "strict prohibition and broken bag inspection" policy, strengthening the promotion of resource recycling and source reduction concepts to the public, reducing daily garbage generation, and preventing non-combustible and incombustible garbage from reaching incinerators or landfills, thereby reducing the risk of fire in environmental protection facilities and improving efficiency of treatment.

Minister Peng and the heads of local environmental protection bureaus joined together and promised to solve the garbage issues once and for all by the end of 2026. Digital management tools will allow the public to keep the government accountable.

Adherence to the idea that “we are all on the same ship” is testimony that the central and local governments are working together for the common environment. The MOENV will continue with its efforts to build a clean and safe environment for Taiwan.

Minister Peng of the MOENV and representatives from 11 counties and cities making their promise to solve garbage issues

Minister Peng (right) and Deputy Minister Shen (left) presenting their signatures

The signatures of MOENV Minister Peng and representatives from 11 counties and cities promising to dispose of exposed garbage properly

8. Ministry of Environment Starts Issuing “Dedicated Environmental Protection Specialist E-certificate”

A dedicated environmental qualification certificate that has been issued for years as a hardcopy will have a new electronic version starting in 2025, as a part of the government’s policy of digital transition and digitalization of certificates. Mr. Tsung-Yung Liu, President of the National Environmental Research Academy (NERA), noted the new e-certificate features many advantages. It is difficult to forge, simple to administer, and quick to certify and issue, all of which lower certification fees and reduce the carbon footprint of the certification process.

The new e-certificate includes a digital stamp of the Ministry of Environment (MOENV) that is difficult to duplicate. It is relatively easy to forge a simple hand-written signature on an electronic document or by presenting the signature as a graphic, and it is difficult to discern if the signature is truly that of the holder. In addition, there is the risk of physical documents being lost or stolen. To deal with these potential security weaknesses, a digital signature must be provided along with a certificate by an institute approved by the competent authority in compliance with the Electronic Signature Act, making the e-certificate more difficult to be tampered with. Upon receiving an email from the NERA informing you that the e-certificate is available for downloading, the e-certificate receiver may log on to the NERA website through a personal computer or mobile device, free from time and location restrictions. The certificate is free to access anytime, anywhere without worrying about losing it.

Advances in network technology offer better transparency and convenience of verifying e-certificates. For example, if a firm is examining a job seeker's qualifications as a dedicated environmental protection specialist, verification of an e-certificate and its contents can be done by simply scanning the QR code on the certificate, whereupon the validity of the certificate will be displayed, obviating the need to call the competent authority and increasing efficiency.

NERA President Liu pointed out that the electronic version of the certificate is very different than its hardcopy version, from its production to the authentication of the certificate itself. The average administrative processing time is not only shortened from seven days to just one day, but also much quicker to approve the certification. After passing the end-of-training exam and as soon as an applicant receives an approval email, the new dedicated environmental protection specialist may download the e-certificate him/herself. There is no need to wait for physical delivery of a certificate.

In addition, the fee for the e-certificate of dedicated environmental protection specialist is only NT$500, as opposed to NT$1,000 for a hardcopy certificate. However, the NERA points out that anyone who receives an e-certificate may also request a hardcopy, as some may wish to display their personal achievement of passing the environmental protection certification test with a physical certificate. Therefore, both the electronic and hard copy versions of the certificate are made available to whoever has a need.

Approximately 10,000 people take the training every year to become a dedicated environmental protection specialist, with an 80% pass rate. A large supply of paper is needed to issue roughly 8,000 hardcopy certificates every year. This e-certificate launched by the NERA has a lower carbon footprint because it not only saves paper but also reduces CO_2 from the production and delivery of paper certificates. On top of that, it is much easier to request or access a certificate online through a cell phone or personal computer, reducing unnecessary travel through traffic and as well as waiting time.

An e-certificate for dedicated professional environmental protection specialist

9. Full Automated and Manual $PM_{2.5}$ Monitoring Data to be Disclosed to Improve Environment and Safeguard Public Health

Regarding the "inclusion of automated monitoring data on fine particulate matter ($PM_{2.5}$) as the legal basis for determining whether air quality meets standards", the Ministry of Environment (MOENV) explained that $PM_{2.5}$ particles come from many sources, have complicated compositions, and vary from one area to another and depending on season. $PM_{2.5}$ particles are also prone to absorbing moisture from the air, which interferes with measurements and necessitates manual sampling and analysis to obtain data free of interfering factors. Thus, since 2012 Taiwan's *Air Quality Standards* (空氣品質標準) has specified the use of manual monitoring data for determining whether meet standards are met, which is consistent with common international practices, including in Japan, the USA, EU and UK.

The MOENV pointed out that manual and automated $PM_{2.5}$ monitoring data serve different purposes. Automated monitoring provides real-time data every hour based on optical principles and is used to provide the public with health protection notifications and allow local governments to respond to air pollution incidents in real time. However, data deviations are sometimes generated due to the interference of salt and moisture in the air. In contrast, manual monitoring is more accurate as moisture interference is more easily removed following monitoring principles, shown in Fig. 1. With removal of moisture interference, manual $PM_{2.5}$ measurements are suitable for evaluating the effectiveness of the overall air pollution improvement strategy. A comparison between automated and manual $PM_{2.5}$ monitoring data

collected throughout Taiwan reveals an average difference of more than 1 μg/m^3 in 2024 at 5 monitoring stations (2 stations with positive deviation and 3 with negative). The deviations are more significant in winter when the air quality is usually poorer, exceeding 1 μg/m^3 at 17 monitoring stations (14 with positive deviation and 3 with negative).

Whether from automated or manual monitoring, the MOENV stressed that all air quality data are made available for the public to access. Historical air quality monitoring results have shown that the annual concentration of fine particulate matter ($PM_{2.5}$) indicates a descending trend indicated by both automated and manual data, as shown in Fig. 2. The practice adopted in Taiwan to analyze both automated and manual $PM_{2.5}$ monitoring data is like international trends. Automated and manual $PM_{2.5}$ monitoring data are displayed together as air quality monitoring data and in annual reports for the purpose of safeguarding public health, responding in real-time to air pollution plumes, and evaluation of air pollution control measures.

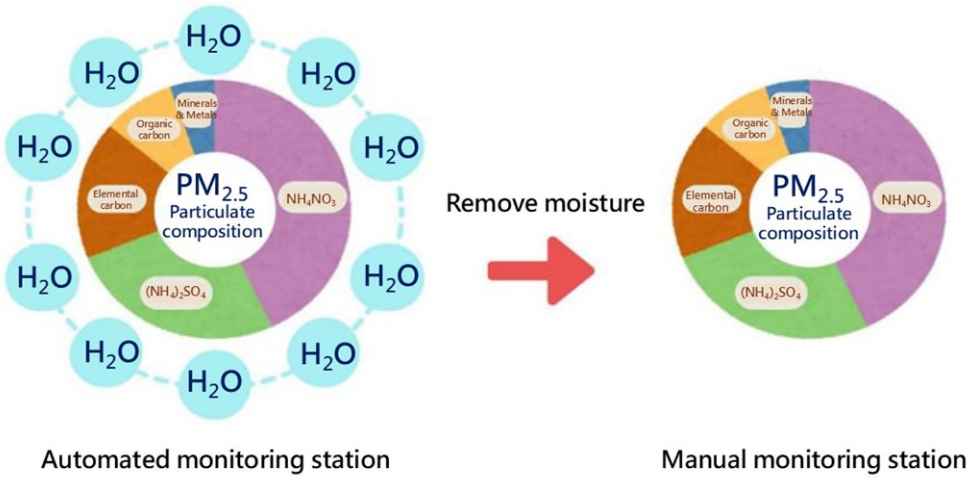


Figure 1: Removal of interference from moisture using manual $PM_{2.5}$ measurement

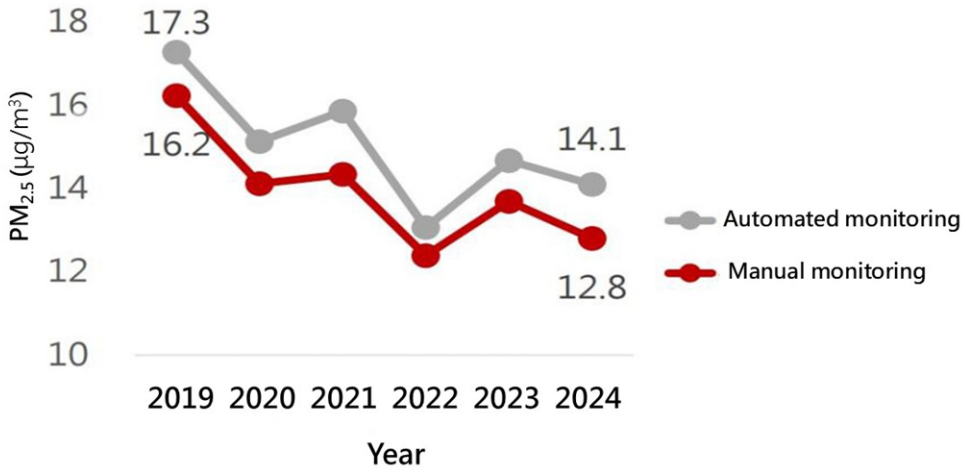


Figure 2: Air quality improvement shown in manual and automated $PM_{2.5}$ monitoring data

10. Travelers Incentivized to Supply their Own Personal Products for Greener Sustainable Travel

New measures to reduce single-use personal products and foster a more sustainable environment took effect on 1 January 2025 in the entire hospitality industry. This represents a giant step for plastic reduction and is an excellent reason to adopt environmentally friendly habits. On 23 January 2025 the Ministry of Environment (MOENV) invited hotel businesses, consumers and partners from across society to establish a new flagpole for green tourism. Before the policy was launched, a survey indicated that 74.0% of respondents supported restrictions on single-use products, and respondents who said they would bring their own personal products increased from 59.6% in past surveys to nearly 90%. For hotels, some put the policy into practice in creative, environmentally friendly and socially beneficial ways, and indicate through their online booking services to remind visitors to prepare their toiletries. Elsewhere, NGOs and the public are giving their thumbs up on social media for the plastic reduction measures. The policy requires people to change their habits and prepare their own personal products when they stay at hotels. Meanwhile, hotels still must consider their guests' needs, so for guests who forget to bring their own supplies, shower products in 180 ml bottles or larger are provided.

According to the new regulations, the hospitality industry, which includes hotels and B&Bs, is to replace personal hygiene products, such as shampoo, conditioner, shower gel and body lotion, in containers smaller than 180 ml with larger containers. It will be prohibited to provide single-use products, such as combs, toothbrushes, toothpaste, razors, shaving cream and shower caps, for free access by guests in hotel rooms or business premises. However, visitors who do not bring their own supplies may ask for products at the reception counter for free or at a price. Deputy Minister Chih-Hsiu Shen reminded travelers to prepare their own personal use products when planning to stay at a hotel. He stressed that the hotels may still provide such products in case

guests do not bring their own. It will not be a violation to provide single-use products, but they are not provided to all guests automatically. Deputy Minister Shen encouraged all travelers to help protect the planet during their trips.

The Resource Circulation Administration (RECA) conducted a survey on 20-21 January 2025 of people over 18 years old, asking what they think about the single-use hospitality product restriction policy. The survey found that 59.6% of the respondents said they always take their own products, while 29.2% said that they will comply with the new policy; in other words, nearly 90% of respondents would bring their own personal products. If forgotten, 56.9% would tend to buy personal products from the hotel and 80% of them would buy individual items. This suggests that hotels should provide individual products based on customer needs. Furthermore, 74.0% of the respondents expressed support for the policy, while 13.6% did not. The RECA will continue working on the approval rate.

Many hotel owners came up with innovative ways to make guests more amenable to the policy, putting the policy into practice in creative, environment-friendly and socially beneficial ways. For example, several hotels set up “personal care product shops”, where customers can choose environment-friendly alternatives or non-disposable products based on their needs. Other hotels offer discounts and coffee vouchers when customers bring their own reusable containers. These are a few ways to encourage guests to enjoy their stays while doing their part for Mother Earth.

Mr. Yeh Chia-Sheng, President of the Yilan Tourism Homestay/B&B Marketing Association, said that the hotel industry in Yilan has actively responded to the plastic reduction policy, and charity donations and convenient services are assisting in reducing the policy’s impact on travelers’ experiences. He pointed out the friendly and environmental protection images of Yilan tourism. TV weather anchor Miss Wang Shuli also shared her experience of bringing her own travel supplies at the press conference. She said that there are many supportive voices online, but there are still a few people who are not accustomed to bringing their own personal products. It takes a little to get used to the change of policy. Sometimes, people simply forget to prepare their own personal products on a business or tourism trip. When they ask for supplies from a hotel, they develop the awareness that “I want what I didn’t bring”. For hotels, the supply is provided based on every customer’s needs instead of the entire set of supplies, i.e., “We provide only what you don’t have”.

Many non-governmental organizations (NGOs) are involved with the development of the UN Global Plastic Treaty and policies to reduce use of plastics. The Trust in Nature Foundation, Re-think, Ocean Citizen Foundation, Citizens Association for Public Policies and Tse-Xin Organic Agriculture Foundation came out and expressed their support for plastic reduction and reduced use of single-use products. Through social media, more NGOs and individuals called on the public to take their own personal products when travelling, to reduce the use of plastics, protect the ocean and love the Earth.

The MOENV pointed out that hotels should clarify how their personal products are provided on their website or when visitors are booking their accommodation, as part

of providing high-quality hospitality services. It is necessary to provide information on how individual products will only be supplied upon request, to prevent overpackaging and waste. On the other hand, to build sustainable travel habits, the public is recommended to pay attention to how personal products are provided while booking accommodation and to develop the habit of traveling with one's own personal products.

MOENV Deputy Minister Shen Chih-Hsiu (middle), Director General Lai Ying-Ying of the Resource Circulation Administration (4th from the left), Miss Wang Shuli, TV weather anchor (4th from the right) and Mr. Yeh Chia-Sheng, President of Yilan Tourism Homestay/B&B Marketing Association (3rd from the right) show support for the "bring your own personal products" policy.

MOENV Deputy Minister Shen Chih-Hsiu (left) shows his own personal product pack

11. MOENV Joins Forces with Junior Chamber International Taiwan for "Cigarette Butts off the Ground for a Better Environment" Campaign

To advance sustainable development and a better environment, on 12 January 2025, the Ministry of Environment (MOENV) signed an MOU with Junior Chamber International Taiwan for the "Cigarette Butts off the Ground for a Better Environment" campaign. The MOU aims to reduce cigarette butt litter on streets, thereby improving the publicly shared environment. It aims to create a cleaner and healthier living space through advocacy, education and promotion of environmental concepts. It will remind businesses about their responsibilities and educate them about environmental protection issues, such as raising awareness of the many pollutants released from cigarette litter.

A survey has shown that cigarette butts are among the most seen pollutants along coasts around the world. In Taiwan, there has been a steady increase in the proportion of cigarette butts in domestic coastal garbage. In 2024, cigarette butts moved up to third place from fourth, suggesting they are becoming a more serious pollution issue. MOENV Minister Peng Chi-Ming pointed out that one cigarette butt may seem insignificant, but littered cigarette butts can cumulatively lead to a profound impact on a city's landscape, environment and the general ecosystem. It is estimated that more than 36.2 billion cigarettes are sold in Taiwan every year. If a quarter of those cigarette butts are littered, more than 9 billion butts are scattered across the environment every year.

Cigarette butts not only spoil urban landscapes but also release more than 4,000

known hazardous chemicals into the ecosystem and environment. Cigarette butts are made of non-degradable plastics and contain thousands of cellulose acetate fibers. They turn into plastic microparticles once they find their way into the environment and even the food chain, which can threaten human health.

Minister Peng emphasized that support and action from all sectors of society are as important as the government's efforts. In particular, the power of civil society has an immeasurably positive influence when it comes to promoting environmental protection concepts and putting solid actions into practice. The cooperation under this MOU is an effort to promote and practice the idea of "cigarettes off the ground" through the extensive social influence of Junior Chamber International and its more than 7,200 members in 153 branches in 14 areas throughout Taiwan. Businesses are invited to provide a means to collect cigarette butts voluntarily where it is convenient, thus keeping the environment clean around business establishments, reducing the pollution caused by cigarette butts, and jointly fulfilling the UN Sustainable Development Goals (SDGs), specifically, SDG 11 (Sustainable Cities and Communities) and SDG 14 (Life below Water).

Once again, the MOENV urged all smokers to: "extinguish cigarettes; not smoke while walking; remove cigarette butts behind you; and throw cigarette butts in an ash tray or garbage can." They are advised to always make sure their cigarette butts are properly extinguished and disposed of instead of being littered, as this will not only make cities more beautiful, but importantly, also, prevent harmful pollutants from decomposing butts from entering the environment.

This cooperation with Junior Chamber International Taiwan signifies commitment to the shared promise of environmental protection, as government and citizens work hand in hand to reach the vision of "fewer cigarette butts for a cleaner environment" and strive toward more beautiful and healthier cities.

MOENV Minister Peng Chi-Ming (right) giving his speech at the MOU signing ceremony

Minister Peng (right) signs the MOU with Junior Chamber International Taiwan

Minister Peng (3rd from right), Director General Yen (2nd from right) and Junior Chamber International partners at the MOU signing ceremony