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Feature
Article

Carbon Emissions Reduction in Taiwan

As a member of the global village, Taiwan has actively taken part in the international response to climate change from the start of such efforts. Besides keeping track of international conventions, Taiwan has strived to shoulder its responsibility in reducing greenhouse gases. The EPA has announced related regulations and guidelines, such as the *Greenhouse Gas Reduction and Management Act* (溫室氣體減量與管理法) and the *National Climate Change Action Guidelines* (國家因應氣候變遷行動綱領). Answering the call of the 22nd Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC COP22) held in 2016, Taiwan has thoroughly mobilized at both the national and local levels. By formulating and fully implementing relevant regulations, Taiwan has laid out specific goals and strategies in its efforts to reduce carbon emissions.

The 22nd Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC COP22) was held in Morocco in November 2016. Since taking part in the UNFCCC COP1, the EPA has attended relevant activities in order to keep abreast of the latest international developments in the response to climate change and carbon reduction, while promoting Taiwan's efforts and achievements in this area in diverse ways.

Taiwan's carbon reduction

measures in response to global developments are listed below:

Promulgating and implementing the Greenhouse Gas Reduction and Management Act

The *Greenhouse Gas Reduction and Management Act* was adopted on 15 June 2015 after three readings in the Legislative Yuan, and was promulgated on 1 July 2015. The promulgation of the act marked Taiwan's official entry into the era of carbon reduction. The act stipulates Taiwan's carbon reduction target for the year 2050

and lays out control targets in five-year stages. It is accompanied by economic incentives and requests to gradually establish a cap-and-trade system. Mitigation, adaptation, and green development will be the general imperatives that guide the EPA's future actions in response to climate change.

Responding to international efforts by sharing the global responsibility for carbon reduction

On 17 September 2015,

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the EPA submitted Taiwan’s Intended Nationally Determined Contributions (INDCs) to the Executive Yuan, which approved them on 16 November 2015.

On 17 November 2015, the INDCs were co-announced by the EPA and the Ministry of Foreign Affairs in a joint press conference. Based on Taiwan’s current conditions as well as strengths and weaknesses, the INDCs were formulated in accordance with measures and guidelines in relevant international climate conventions. A carbon emission reduction goal of a 50% reduction from business as usual (BAU) levels by 2030 was stipulated, equal to a 20% reduction from 2005 levels. This stipulated goal also meets the phased goal of cutting emissions by 50% below 2005 levels by 2050,

as stipulated in the *Greenhouse Gas Reduction and Management Act*.

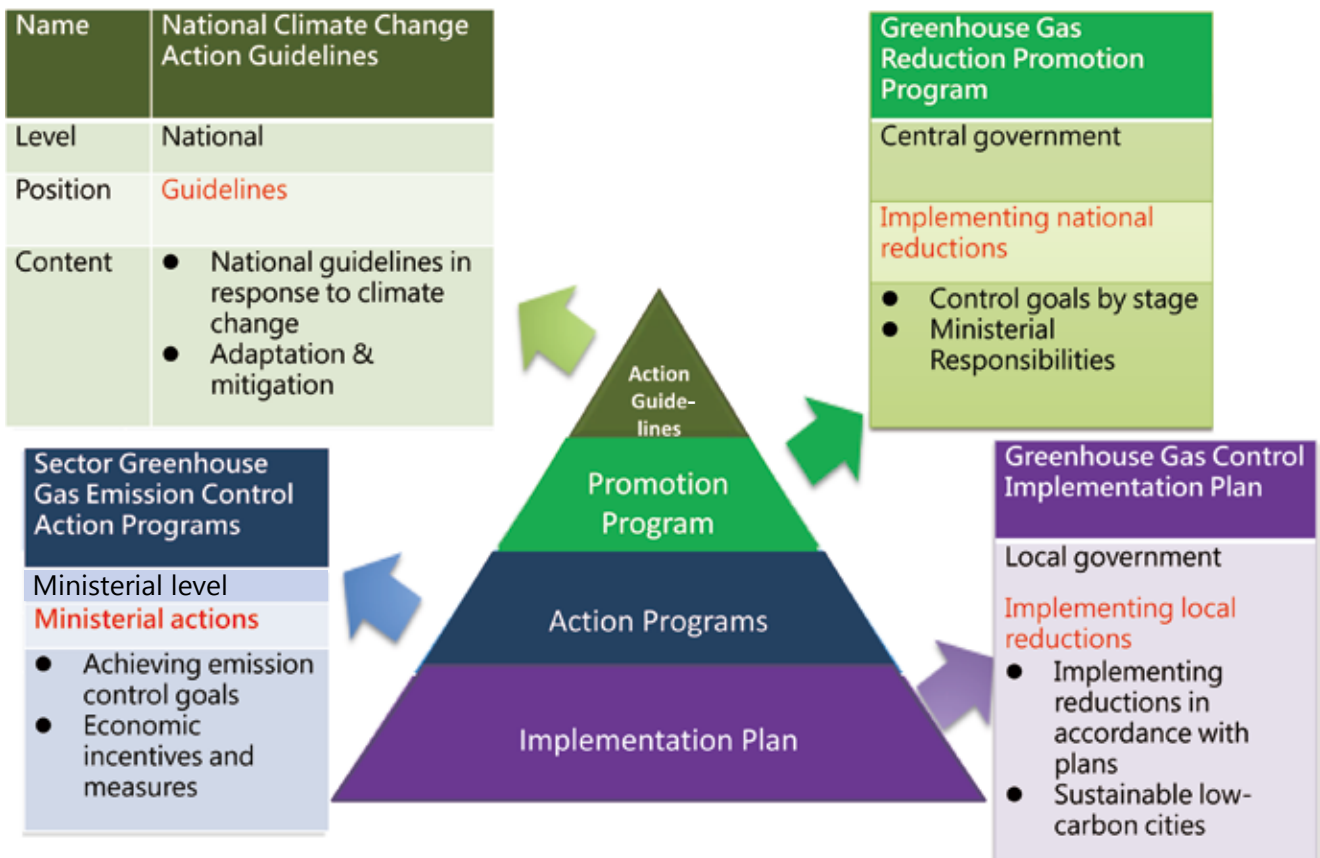
Adopting the National Climate Change Action Guidelines

The *National Climate Change Action Guidelines*, passed by the Executive Yuan on 23 February 2017, specifically set out the general directions for Taiwan’s climate change mitigation and adaptation. The guidelines also mobilize interministerial resources to build up national capacities in response to climate change. Giving equal importance to climate change mitigation and adaptation, the guidelines cite ten principles for the response measures, such as excluding the option of new nuclear power facilities, along with including climate change mitigation and adaptation

measures in the review of strategic environmental assessment and environmental impact assessments for development projects. The guidelines also emphasize the incorporation of public participation, risk management, green finance, carbon pricing, and environmental education in policy formulation. The Chinese and English versions of the *National Climate Change Action Guidelines* and related information are available online at <http://www.epa.gov.tw/mp.asp?mp=ghgact>.

Announcing the Phased Greenhouse Gas Control Targets and Guidelines for Control Measures

To provide guidelines for formulating related control regulation for phased control targets stipulated in the



The framework of Taiwan’s action in response to climate change

Greenhouse Gas Reduction and Management Act, the EPA jointly announced the *Working Guidelines for Formulating Greenhouse Gas Phased Control Targets and Control Measures* (溫室氣體階段管制目標及管制方式作業準則) with the Ministry of Economic Affairs (MOEA), the Ministry of Transportation and Communications (MOTC), and the Council of Agriculture (COA), on 28 March 2017. The guidelines specify procedural regulations concerning factors to be considered, formulation methods, as well as performance evaluation and adjustment mechanisms.

To achieve the carbon reduction goal stipulated for 2050 in the *Greenhouse Gas Reduction and Management Act*, control targets have been set in five-year stages and will undergo revisions on a rolling basis based on results of regular performance evaluations. For the process of formulating phased control targets, the guidelines require estimations and scenario analyses of carbon emission trends at both the national level and sector level, in order to formulate medium-term goals and visions, and assess impacts on the economy, energy supply, the environment and society in general. Expert consultations and public hearings are also required to enhance public participation and transparency.

In addition, control targets in each stage will be reached through the *Greenhouse Gas Reduction Promotion Program* (溫室氣體減量推動方案) and the *Sector Greenhouse Gas Emission Control Action Programs* (部門溫室氣體排放管制行動方案). Accompanied by

the national and sector evaluation indicators, sector carbon reduction goals, and emission data and statistics, annual evaluations will be conducted to examine the performance, and parties failing to achieve the set goals will have to formulate improvement plans. After discussion by related ministries, the first stage (2016 to 2020) control targets have been formulated and will be submitted to the Executive Yuan for approval and future implementation.

Specifying Ministerial Responsibilities stipulated in the Greenhouse Gas Reduction and Management Act

To clarify carbon reduction obligations, the EPA has asked the relevant ministries to reexamine and update their own responsibilities based on the policies of President Tsai Ing-wen and Premier Lin Chuan's policy guidelines, as well as clearly delineate the responsibilities of each ministry in accordance with Article 8 of the *Greenhouse Gas Reduction and Management Act*.

As the primary *National Climate Change Action Guidelines* and the interministerial *Working Guidelines for Formulating Greenhouse Gas Phased Control Targets and Control Measures* were promulgated, the EPA will collaborate with other government agencies to set the short-term phased carbon control targets and medium-term visions based on the *Greenhouse Gas Reduction and Management Act*, and also draft the national *Greenhouse Gas Reduction Promotion Program*. Focusing on the six areas of energy, manufacturing, transportation,

residence and commerce, agriculture, and environment, each agency will propose its own Sector Greenhouse Gas Emission Control Action Program. Local governments will formulate their own greenhouse gas control implementation program in accordance with the central government's promotion programs and the action programs as mandated by Article 15 of the *Greenhouse Gas Reduction and Management Act*, and draft their own Greenhouse Gas Control Implementation Plan (溫室氣體管制執行方案) so that all carbon reduction measures can be carried out at the regional level.

Announcing the Regulations Governing Incentives for Energy Efficiency Standards

The EPA encouraged enterprises to step up carbon reductions before the implementation of cap control by promoting a reward mechanism for greenhouse gas offset programs, based on Article 22 of the *Greenhouse Gas Reduction and Management Act*. In an effort to establish a legal basis for the reward mechanism, the *Regulations Governing Incentives for Energy Efficiency Compliance Standards* (溫室氣體排放源符合效能標準獎勵辦法) were announced on 15 March to increase incentives for enterprises' voluntary reductions.

To acknowledge the effects of enterprises' mitigation measures, the regulations provide emission allowances as incentives and specify suitable applicants, qualifications, and usages of allowances. Based on Article 17 of the *Greenhouse Gas Reduction and Management Act*, the EPA has planned to gradually formulate

energy efficiency standards for different industry categories or manufacturing processes as a basis for incentives. Standards will be set first for emission sources for industrial and energy sectors, and draft standards are expected to be completed for energy efficiency for different industries and manufacturing processes in mid-2017. In the future, the system will be expanded to cover transportation, residential and commercial sectors so that enterprises intending to carry out mitigation measures can be offered incentives to do so early.

Combining local and non-governmental momentum on carbon reduction

The *Greenhouse Gas Reduction and Management Act* has clearly mapped out government agency authorities

and promotion strategies as well as included mechanisms for public participation and division of responsibilities. To improve society's capacity to respond to climate change, the EPA actively promotes public awareness of climate change through education. Partnerships are also established with the EPA and regional agencies to jointly carry out carbon reduction and mitigation projects so that public awareness and society's capacity for carbon reduction can be built up, thus reducing the impacts of climate change.

Future outlook

Looking to the future, Taiwan is on the verge of a turning point as it faces increasingly severe global challenges brought by climate change. In an effort to maintain a competitive edge, the

Taiwan government will come up with more proactive energy saving and carbon reduction policies and implement mitigation measures. Meanwhile, the EPA will collaborate with international partners via exchanges on relevant policies, technologies, and experiences, as well as establish a management mechanism that connects to the global carbon market. As carbon reduction targets and regulations come out, the EPA hopes to improve Taiwan's ability to respond to climate change through collaborations between the central government and local governments and between the public and private sectors, striving to construct a low-carbon society with sustainable environmental, economic, and social features.

Toxic Substance

Premier Lin Visits Toxic and Chemical Substances Bureau

On 2 June 2017, Premier Lin Chuan inspected the Toxic and Chemical Substances Bureau of the Environmental Protection Administration, Executive Yuan, which was established as an implementation of the first ring of President Tsai Ing-Wen's Five-Defense Food Safety Promotion Policy to draw up a mechanism and focus on at-source control of toxic chemical substances. Through the inspection, the government showed its determination to control all toxic chemical substances from their sources and to build a sustainable environment with safe chemical substances by tracking the source and taking immediate action to protect food safety.

Food safety has become a major issue due to the multiple incidents that happened in recent years. In response, the government came up with a resolution, Five-Defense Food Safety Promotion Policy, and listed food safety as a priority for policy making in every government agency. Not only is the establishment of the Toxic and Chemical Substances Bureau a

key implementation of the relative policies, the inspection by Premier Lin on 2 June also shows the importance the government places on food safety.

Premier Lin mentioned during the inspection that his goal is to achieve sustainable and green chemistry and to provide a safe and non-toxic environment for the

citizens. Hence, he expects the Toxic and Chemical Substances Bureau to: properly manage the sources of chemical substances by cooperating with different ministries; prevent illegal practice by conducting professional and strict inspection; develop a risk assessment and communication mechanism; and keep up with international management trends.

Premier Lin also expressed his appreciation to the personnel on the toxic disaster response team for taking the risks to stand on the frontline and protect the health and happiness of our citizens. Moreover, he specifically requested that the EPA minister give priority to supporting the personnel on the response team and ensuring their safety while carrying out their missions.

Chemical substances are widely used for convenience in daily life. However, chemical substances can cause serious harm to the environment and human health if they are misused or abused. The EPA established the Toxic and Chemical Substances Bureau for the goal of building a safe and sustainable chemical environment. To achieve that goal, the first step in the Toxic and Chemical Substances Bureau's plan is to develop a management strategy for chemical substances according to the UN's Strategic Approach to International Chemicals Management.

Chemical substances for general

use had been under separate management by different ministries, so all the relative information was in strong need of integration. Since source management is one of the Toxic and Chemical Substances Bureau's jobs, the Chemicals Cloud was established to integrate data of chemical substances and to strengthen the cross-ministrial management. The Chemicals Cloud is not only beneficial when competent authorities are conducting inspections and comparisons, but it also provides warning service to prevent illegal use of chemical substances.

To ensure food safety and the safe use of chemical substances, the Toxic and Chemical Substances Bureau has already started revising the *Toxic Chemical Substances Control Act*. The revision will expand the control list of chemical substances by examining the chemical substances that are for general use or are highly discussed internationally and then gradually adding the substances with potential harmful effects onto the

control list. The first step is to strengthen the management of the chemical substances that are used illegally in food by making an announcement about regulating the chemical substances that have caused domestic or international food safety problems in the past 13 years. The announcement will be able to restrict businesses from the import, manufacture, sale, or use of those chemical substances and hence reduce the risk of illegal chemical substances in food.

To show its determination to control chemical substances at the source, the Toxic and Chemical Substances Bureau started promoting the Investigation and Guidance Plan for the Chemical Raw Material Industry from February 2017 and started the implementation on more than 2,000 businesses in May. The Toxic and Chemical Substances Bureau began the plan from establishing a basic database for toxic chemical substances, and accompanied it with four supporting guidance strategies including: investigating the flow of chemical substances, asking the buyers' usage of the



➡ Premier Lin Chuan (front row, center), EPA minister Ying-yuan Lee (front row, fourth from the left) and personnel of the Toxic and Chemical Substances Bureau

chemicals, storing chemical substances separately according to their toxic characteristics, and immediately reporting any violation. Furthermore, the Toxic and Chemical Substances Bureau partnered with local governments

and chemical raw material business associations to conduct priority inspections on the 57 chemical substances that contain food safety risks. By providing on-site investigation and guidance, businesses could acquire the

basic knowledge of chemical substances. Also, the EPA can better control the flow of chemical raw materials to avoid them being used illegally in food and harming public health.

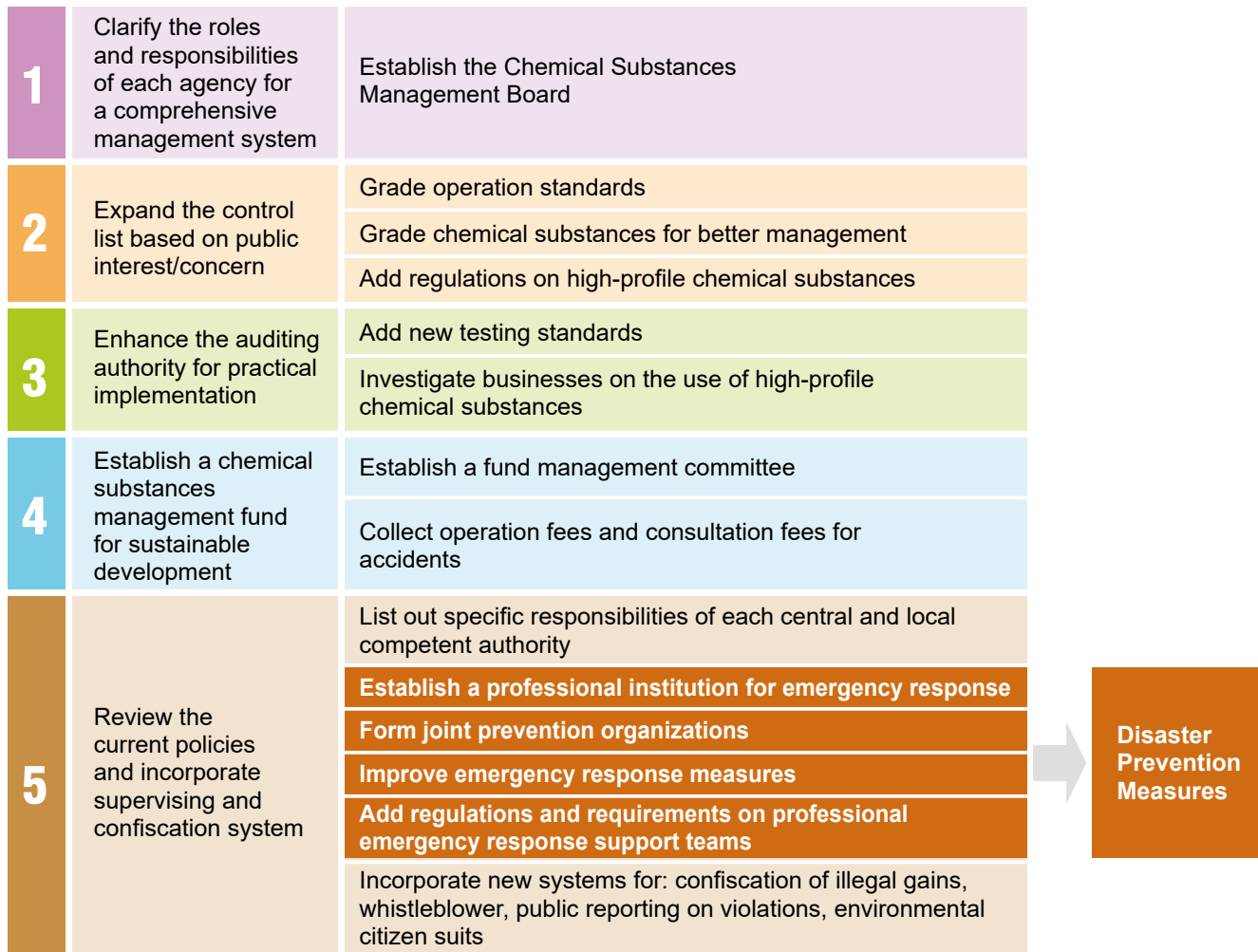


Figure: Five main points of the amendments to the Toxic Chemical Substances Control Act

Environmental Monitoring

EPA Provides Mercury Monitoring Instruments to Vietnam and Philippines

In an attempt to deepen regional cooperation in atmospheric mercury monitoring, Taiwan provided wet deposition samplers for mercury to Vietnam and the Philippines to improve the effects of atmospheric mercury monitoring in East Asia. It was brought about from the agreement made during the 6th Annual Asia Pacific Mercury Monitoring Network Partners Meeting and the 2017 Atmospheric Mercury Monitoring Training Workshop, both of which were jointly held by the EPA and USEPA on 15 - 19 June, 2017. Attendees from environmental agencies, academia, and research circles from a total of 10 countries took part in both events, with Minister Ying-Yuan Lee of the EPA and Chief of Staff Martin Dieu of the USEPA co-presiding the opening ceremony.

The EPA said that Taiwan has accumulated over a decade of atmospheric mercury monitoring data since the establishment of Lulin Atmospheric Background Station in 2006. In 2012, Taiwan also signed the cooperation agreement with the US and joined Atmospheric Mercury Network (AMNet), the first nation in Asia to become a member. With the same monitoring technology as that in advanced countries, Taiwan has begun further sharing it since 2014 by initiating pilot studies with Vietnam, Thailand, and Indonesia, as well as providing a wet deposition sampler for mercury. So far a total of 113 samples taken in Thailand have been delivered to Taiwan and will greatly benefit the establishment of regional mercury monitoring network in East Asia.

To strengthen the atmospheric mercury monitoring cooperation in the Asia Pacific region as well as monitoring capacity, the EPA and the USEPA jointly held the 6th Annual Asia Pacific Mercury Monitoring Network Partners Meeting and the 2017 Atmospheric Mercury Monitoring Training Workshop on 15 - 19 May, 2017. Representatives from environmental agencies



➤ *Minister Ying-Yuan Lee of the EPA (left) and Chief of Staff Martin Dieu of the USEPA co-preside the opening ceremony of 6th Annual Asia Pacific Mercury Monitoring Network Partners Meeting and the 2017 Atmospheric Mercury Monitoring Training Workshop*

and academic researchers from a total of 10 countries, including the US, Canada, Korea, Vietnam, Thailand, Indonesia, Mongolia, the Philippines, and Bangladesh, attended the event and discussed various monitoring issues. The opening ceremony was presided by Minister Ying-Yuan Lee and the Chief of Staff Martin Dieu, of the USEPA. It was agreed that Taiwan would provide Vietnam and the Philippines each with a wet deposition sampler for mercury to further Taiwan's mercury monitoring cooperation with Southeast Asian countries.

The Meeting and the Workshop both centered around the technical training of wet deposition sampling and analysis of mercury. In addition to visiting the Center for Environmental Monitoring and Technology and a mercury analysis

laboratory, attendees also had hands-on practice and training on trace mercury analysis to improve the partnering countries' quality assurance/quality control (QA/QC) of mercury monitoring data.

The EPA pointed out that the Taiwan-established Center for Environmental Monitoring and Technology can continue assisting other partnering countries in the Asia Pacific region in building mercury monitoring, sampling, and analyzing technology, personnel training, as well as regional information exchange and cooperation. In the meantime, mercury monitoring data and information of East Asian countries can also be shared, which will help expand the environmental monitoring and testing industry in Taiwan.

Water

Taiwan and Australia Jointly Investigate Oil Spill Case

In March 2017, an oil spill incident occurred in Green Island Township, Taitung County. To track down the offenders, in early April EPA officials, along with officials from the Northern Port Center of the Maritime and Port Bureau (MPB) of the Ministry of Transportation and Communications (MOTC) and the representatives of the CR Classification Society, traveled 6,550 kilometers to the town of Esperance in southwestern Australia. Representing the Taiwan government, the EPA officials boarded a ship accompanied by Australian Maritime Safety Authority (AMSA) officials to conduct inspections and take samples from the ship. This inspection demonstrated Taiwan's commitment in the area of marine environment protection and its determination to crack down on illegal activities.



➡ Taiwan officials examine the suspected vessel's navigation path with an inspector of the Australian Maritime Safety Authority (first on left).

To find those responsible for the oil spill, the EPA actively traced the navigation routes of various vessels since the incident occurred on 10 March. By combining the MOTC's data from an automatic identification system (AIS) with information from marine experts and local diving instructors on Green Island, they learned that one suspected vessel was to soon dock in the Australian port of Esperance.

The EPA conveyed to AMSA the Taiwan government's determination to protect the marine environment from pollution, and also asked the Ministry of Foreign Affairs (MOFA) to formally request assistance from the Australian government. After days of negotiation, AMSA agreed to allow EPA personnel to board the ship in question to conduct inspections and take samples in the capacity of Taiwan government officials.

The EPA stated that inspection and sampling in this case closely involved marine pollution

prevention and control, Port State Control (PSC), vessel equipment management, oil sampling, and security. A team of two EPA officials, one official of the Northern Port Center, and one representative from the CR Classification Center set out from Taiwan on 1 April and, upon arrival, met with AMSA's head PSC inspector to present full details of the incident. AMSA duly acknowledged the Taiwan government's determination and effort in this transnational investigation to find polluters.

The focus of this mission was to board the vessel in question along with AMSA's PSC inspectors and

➡ Taiwan officials accompanied by AMSA officials board a suspected ship for inspection.

conduct inspections and sampling. While docked at Esperance Port on 4 April, the ship was boarded, 15 oil samples were collected from seven cabins on the ship, and information was collected from documents including: the certificate of the ship's nationality, International Oil Pollution Prevention (IOPP) Certificate, crew list, oil records, and navigation plans. No clear sign of illegal dumping of waste oil was found after the initial examination of documents currently obtained.

The oil samples collected were divided into two sets, one of which was flown to the EPA's Environmental Analysis Laboratory, whose test results will serve as important reference data for follow-up investigation and future study. The other set is under the custody of a professional institute with which AMSA works.

For the smooth conclusion of this



mission, the EPA expressed its gratitude to the MOTC, MOFA, and CR Classification Center for offering personnel for the trip to

Australia and professional support, and also thanked AMSA for its recognition and assistance in the pursuit of possible polluters.

The first Taiwan-Australia collaboration in the area of marine pollution control and response was successfully carried out.

Air

Amendments to Regulations Governing Emergency Measures to Prevent Severely Deteriorated Air Quality Announced

In response to the air quality index (AQI) in central and southern Taiwan exceeding the standard during fall and winter, the EPA announced with the Ministry of the Interior (MOI), Ministry of Economic Affairs (MOEA), Ministry of Transportation and Communications (MOTC), Ministry of Health and Welfare (MOHW), and Ministry of Education (MOE) amendments to the *Regulations Governing Emergency Measures to Prevent Severely Deteriorated Air Quality* (空氣品質嚴重惡化緊急防治辦法) on 9 June, 2017 to hasten the improvement of air quality.

Data of manual sampling and monitoring of particulate matter (PM_{2.5}) shows that the average PM_{2.5} concentrations from 2013 to 2016 in Taiwan is 24, 23.5, 22 and 20 µg/ m³, respectively. The trend reflects a gradual decline

of national PM_{2.5} concentrations and indicates effects of control measures. However, except for the three counties on the east coast, the average PM_{2.5} concentrations of other cities and counties are still higher than the standard of 15 µg/

m³. Moreover, air quality of PM_{2.5} in Taiwan fluctuates with location and time of year. Monitoring stations in central and southern Taiwan receive PM_{2.5} reading over the standard value of 35 µg/ m³ reached about 50% during fall

⬇ Air quality alerts and air pollutant levels that cause severely deteriorated air quality

Categories		Alert		Severely Deteriorated			Unit
		2 nd rate	1 st rate	3 rd rate	2 nd rate	1 st rate	
PM ₁₀ ≤ 10µm	Hourly average	-	-	-	1050 for 2 consecutive hours	1250 for 2 consecutive hours	µg/m ³
	24-hour average	126	255	355	425	505	
PM _{2.5} ≤ 2.5µm	24-hour average	35.5	54.5	150.5	250.5	350.5	Mg/m ³
SO ₂	Hourly average	76	186	-	-	-	ppb
	24-hour average	-	-	305	605	805	
NO ₂	Hourly average	101	361	650	1250	1650	ppb
CO	8-hour average	9.5	12.5	15.5	30.5	40.5	ppm
O ₃	Hourly average	0.125	0.165	0.205	0.405	0.505	ppm

Note: Index calculation for each rate of alerts and serious worsening

1. 24-hour averages for PM₁₀, PM_{2.5}, and SO₂ are mobile averages.
2. 8-hour average for CO is mobile average for 8 consecutive hours.
3. Hourly averages for PM₁₀, O₃, NO₂, and SO₂ are real-time concentrations.

and winter. Therefore, improving air quality in central and southern regions during fall and winter is a top priority of air pollution control in Taiwan.

The EPA pointed out that the regulations are amended for government agencies, public and private venues, use of public transportation, and student events to take emergency measures when air quality is prone to deterioration due to weather changes or other factors. Different concentrations for severely deteriorated air quality and respective response measures are primarily based on the *Air Pollution Emergency Contingency Actions* of the US.

According to the regulations, alerts for severely deteriorated air quality are classified into two categories

and five levels (two levels for alerts and three levels for severe deteriorations). Before air quality reaches a severely deteriorated state, feasible and highly effective measures like cutting down manufacturing and voluntarily reducing load are taken to improve air quality in advance while still in the state of alerts.

The EPA emphasized that all measures on pollution source control are to stop, delay, or cut down pollutant emissions, and they shall be conducted only when personnel and facility safety is ensured so that emissions of air pollutants are lowered during manufacturing processes. Proper measures need to be determined based on the main pollutants at the time of alert announcements, but controls should also be considered

for pollution sources of precursors for (fine) particulate matter and ozone.

If unable to install air pollution control facilities or take relevant measures in accordance with the regulations, public or private venues must present an alternative emission cutting proposal and carry it out after gaining approval from the competent authorities in the special municipal government, county, or city governments. After referencing from the control guidelines in alerted regions for different alert rates, these authorities will announce needed control measure, based on the local weather and characteristics of pollutant sources, and then include them in the overall air pollution control plans.

Environmental Monitoring

Collaboration Agreement Signed with Central Weather Bureau to Enhance Environmental Monitoring

On 4 May 2017, the EPA, the Central Weather Bureau (CWB) and the Ministry of Transportation and Communications (MOTC) jointly signed the Technical Cooperation Agreement on Environmental Quality Monitoring and Forecasting Operations. By combining the CWB's technical resources, the efficiency of doing calculations for the air quality model will be three times faster, resulting in better temporal and spatial resolutions and accuracy in forecasts. The CWB will assist the EPA in applying satellite data in environmental monitoring, enhancing aerosol retrieval and analyses of dust storms and biomass burning, tracing transboundary pollutants such as those from the East Asian haze or dust storms from China in real time, and using remote sensing to provide information on heat sources in order to monitor abnormal high-temperature burning incidents.

The EPA stated that as weather conditions are a key factor in air quality, the CWB's WINS (Weather Integration and Nowcasting System) is used to obtain weather information such as real time ground observation data, ground and aerial weather graphs, high temporal and spatial resolution satellite images, and radar

reflectivity images for analysis of local circulations and overall weather conditions. To get more detailed forecast data on air quality, the EPA and CWB have signed a cooperation agreement in which the calculating resources of the CWB's supercomputer will be used to analyze air quality models. Additionally, high-resolution

regional models will be included in analyses to greatly enhance temporal and spatial resolutions of forecast data in order to meet urgent response needs on poor air quality days in fall and winter.

The EPA has also been working with the CWB to develop remote sensing data and adopt new

algorithms and image processing technology. The high-temporal resolution and high-spectrum images captured every ten minutes by Japan's geosynchronous satellite Himawari-8 will be used. The images provided by this satellite will not only make up

for the observatory data that is currently received only twice a day from the polar orbiting satellites, but will also be used to develop more satellite retrieval data such as heat sources, optical depths of aerosols, color enhancement of East Asian hazes and sandstorms.

All these aim to strengthen the tracking of transboundary movement of East Asian pollutants as well as any subsequent applications for environmental monitoring.

The signing of the cooperation agreements will magnify the effect of information sharing and exchange between the EPA and CWB. Other than improving the efficiency of dynamic air quality forecast modelling and the use of remote sensing for environmental monitoring, the agreement will allow exchanges of marine and land weather monitoring data and forecasting information. The EPA expects that the agreement will make the best use of the observatory information obtained by both parties and accelerate the application of environmental forecasting data.



↑ Air quality monitoring data and weather forecasts are synchronized on both the EPA and CWB's apps.

International Cooperation

German Parliament Members and Experts Attend the First Taiwan-Germany Environmental Forum

On 12 April 2017, the EPA held the First Taiwan-Germany Environmental Forum in Taipei. Chair of the Bundestag's (the German Parliament) Committee on the Environment, Nature Conservation and Nuclear Safety, Ms. Bärbel Höhn, Bundestag member Klaus Mindrup, and two other experts from Germany were invited to jointly explore future prospects for environmental cooperation between Taiwan and Germany. Both parties discussed issues such as energy conservation, carbon reduction, renewable energy development, a circular economy, and corporate and civic participation. The forum marked a new page in environmental cooperation between Taiwan and Germany.

The First Taiwan-Germany Environmental Forum was the first dialogue between high-level officials from the two nations on environmental issues. EPA Minister Ying-Yuan Lee, Deputy Foreign Minister François Chih-Chung Wu, Bundestag member and Chair of the Bundestag's Committee on the Environment, Nature Conservation and Nuclear

Safety, Bärbel Höhn, and Deputy Director General of Deutsches Institut Taipei, Sabrina Schmidt-Koschella, all gave remarks at the opening. Forum attendees included representatives from Taiwan's industry and academia, Berlin Energy Agency CEO Dr. Michael Geißler, as well as managers of community service business associations, representatives of

related environmental agencies, and scholarly experts from Germany. There were exchanges on a broad range of topics and the prospects of joint cooperation between Taiwan and Germany were explored. The forum received wide support from all parties, with more than 180 participants hailing from industry, government, academia and other circles.



↑ Ms. Bärbel Höhn, member of Bundestag and Chair of Germany's Committee on the Environment, Nature Conservation and Nuclear Safety, gives a presentation at the First Taiwan-Germany Environmental Forum.

In his opening remarks, EPA Minister Ying-Yuan Lee commended Germany's role as a global leader in promoting non-nuclear forms of energy. He pointed out that Germany's development of renewable energy has allowed the country to move away from nuclear energy. Particularly, it now leads the world in solar and wind energy generation, which Taiwan can learn from. Minister Lee also recommended to the forum participants the book *Heart of Europe*, which discusses the experiences of transitioning from high-polluting chemical factories in East Germany and the transition in the German energy sector. In the future, the two countries should further exchange and interact in this field as Taiwan is currently facing similar issues.

Deputy Foreign Minister Wu

mentioned in his opening address that climate change is a critical issue that requires close global cooperation. As a member of the international community, Taiwan has actively participated in carbon-reduction activities. The government of Taiwan has passed the *Greenhouse Gas Reduction and Management Act* (溫室氣體減量管理法), announced Taiwan's Intended Nationally Determined Contributions (INDCs) along with carbon reduction targets, and has promoted the development of renewable energy with the goal of a nuclear-free homeland by 2025. As Germany's achievements in environmental protection and renewable energy development are well recognized, Deputy Minister Wu said he had high expectations for the outcomes of the forum.

During the forum, Chair of the Bundestag Committee on the Environment, Nature Conservation

and Nuclear Safety, Bärbel Höhn, gave a talk titled "German Environmental Policy: Current Status and Outlook." She shared Germany's experiences in climate policy and renewable energy development, and she explored the role of renewable energy during energy transition and the application of relevant regulations.

On the topic of a circular economy, other experts from Germany presented the status of Germany's promotion of resource efficiency and bioenergy, setting the foundation of future cooperation between the two nations in a circular economy. Experts from Germany also shared measures adopted by German corporations and citizens to take part in environmental protection. Many such measures will help Taiwan to build its own public participation mechanisms.



↑ EPA Minister Ying-Yuan Lee (front, sixth from right) and the invited experts of the First Taiwan-Germany Environmental Forum

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