13 CLIMATE ACTION



SDG 13 Take Urgent Action to Combat Climate Change and Its Impacts

As a result of a high-level of urban development and the serious impacts of climate change, metropolitan areas all over the world face different risks and challenges of varying degrees associated with their aquatic environments and characterized by water scarcity or overabundance including flooding, heatwaves, torrential rains, and droughts. These extreme weather patterns not only pose a major threat to the lives and property of ordinary citizens but also have a negative influence on sustainable urban development. The creation of the sponge city helps effectively regulate the micro-climate of cities and minimize the impact of urban heat island effect. The promotion of the garden city policy, on the other hand, reinforces food and agriculture education concepts, stimulates public participation, and helps create cities characterized by green health, education, and lifestyles. An effective management of GHG emissions is achieved through the adoption of green transportation, green power, and energy conservation strategies.

Promoting A Sponge City Policy

Due to climate change, this city is also facing pressing challenges that come with it. In terms of addressing climate change and regional extreme weather, this city has put flood control and river regulation at the core of the city's long-term climate action plan to make this city a safe and habitable waterfront city for the citizens. However, considering the challenges from extreme climate and competition for water resources in the future, currently Taipei City has formulated its water environmental policy based on the concept of the sponge city. With "Resilience and Adaptation", "Sustainable Water Usage" and "Vibrant Water Environment" as the visions, the city government will build a safe, sustainable, accessible and eco-friendly water environment.

The 3 visions of a sponge city include the following 6 goals: "Restoring Urban Water Cycle", Increasing Flood-Resisting Capacity", "Diverse Water Reuse Sources", "Stable and Efficient Water Supply", "Livable Natural Habitat" and "Promoting Waterfront Activities". Thirteen strategies and 170 plans have been formulated accordingly with a 4-year budget of NT\$22.7 billion. Construction and management will ensure permeable pavement on roads and squares, promote green roofs, increase the city's flood retention capacity, upgrade wastewater processing, ensure diverse reuse of recycled water, conserve and protect water environment and build a leisure environment with great water accessibility. These measures will help the city retain water, adjust the microclimate via transpiration and build disaster tolerance and resilience facing extreme rainfall, transforming the city into a sustainable sponge city that is resilient, capable of dissipating heat via water and adaptive to all future challenges.



Three Visions and six Goals for the Sponge City Policy for Taipei

Under the three visions, six goals, thirteen strategies and 170 plans, the city has implemented the following key projects from 2015 to 2018.

Vision 1: Resilience and Adaptation - Restoring urban water cycle and strengthening flood-resisting capacity

- A. Permeable pavement: 173,819 m² of permeable pavement installed at public facilities.
- B. Increase green resources: Approximately 385,062 m² of green spaces added.
- C. Increase flood retention capacity: 79,000 m³ increased in public facilities. Runoff distribution 119,564 m³ through public-private collaboration

Vision 2: Sustainable Water Usage - Diverse water reuse sources and stable and efficient water supply

- A. Recycle and reuse of wastewater: Monthly average of recycled wastewater reached 216,201 m³.
- B. Recycle and reuse of rainwater: Approximately 1,463 m³ of rainwater collected from rainwater harvesting in parks and campuses
- C. Promote tap water and reduce bottled water consumption: Tap water fountains installed at 536 locations.



- A. Sewer pipe connections: Another 45,128 households connected to the sewer pipe.
- B. Waters ecological environmental education: Hundreds of seminars held with an approximate total of 308,393 people in attendance.
- C. Waterfront and water activities promotion: More than 2.6 million participated in the eight key events with the blue highway theme.





Accumulated area of permeable pavement by year (m²)

Accumulated runoff distribution by year (m³)

Facing the challenges of climate change, Taipei City will continue to work toward becoming a water-friendly and green city by increasing the percentage of green infrastructure at the city's public facilities. The city plans to, by 2030, reach 80% in green infrastructure at the public facilities and increase water retention capacity by 1.15 million m³ (same level as parks and green spaces). Another goal is to reach 16% in water recycling in wastewater processing. Through an open government, citizen participation and public-private collaboration,

this city can retain more water to reduce floor risk when facing extreme rainfall, dissipate heat to mitigate urban heat island effect at high temperature and provide a stable and diverse water supply to the public and businesses when water resources are in short supply. These will transform Taipei City into a sponge city that provides citizens with great water accessibility and a diverse aquatic ecosystem.



Permeable pavement on bike lanes

Promoting installation of permeable pavement at public facilities

Limited land and high population density of the city make it hard to find space for detention basins. Therefore the city government has actively promoted the installation of rainwater outflow suppression facilities at private buildings to increase flood resilience and reduce flood risks during heavy rains. The government also promotes other water retention measures during the development of public facilities (schools, parks, parking lots, etc.). Green space and other measures with better water permeability can be used to mitigate the urban heat island effect, improve water environment resilience and distribute rainwater runoffs in the catchment area. For private buildings, install rainwater outflow suppression facilities, increase rainwater detention capacity and reduce peak runoff volume and thus the sewage load is lower during heavy rains. These will prevent an increase in runoff volume during the development of a building's foundation.

Taipei City also aims to gradually restore the natural water cycle in the city and allow rainwater to replenish groundwater with the "pedestrian environment improvement plan", which updated and expands parks, squares, parking lots and school campuses. A total of 173,819 m² of permeable pavement was installed during 2015 to 2018, equivalent to 417 standard size basketball courts. An on-site test at these permeable pavement showed that the peak surface temperature dropped by 2.05 to 3.53 °C and runoff dropped by 7.3% to 17.85%, proving that these pavements can adjust the city's microclimate and mitigate the urban heat island effect.



Permeable pavement at the North Gate Square

Public-private collaboration on disaster prevention and the increase in flood detention capacity

Public-private partnership is promoted to gradually increase the city's flood-resisting capacity by installing rainwater outflow suppression facilities at building foundations, which retain a total amount of 113,456 m³ of water. The city government also implements the concept of comprehensive drainage basin planning. In 2015, Jinrui Flood Management Park was built with a total of 27,000 m³ in flood regulating capacity. A flood detention pond with a capacity of 6,000 m³ was built in



 Flood detention pond at the military police camp on Xinhai Road, Wenshan District

the Wenshan Sports Center in 2017. Another flood detention pond with a capacity of 46,000 m³ was built in a military police camp in January 2019. The three combined give the city a total of 79,000 m³ in detention capacity, which has boosted its regional flood resilience dramatically.

Promoting the Garden City Policy

Garden city is not another green project in the traditional sense. Instead, it encourages people to find any idle space, rooftops, campuses and any interesting corners in a community to grow edible plants and create a friendly urban view based on the diverse value of food/agricultural education, community exchanges, spatial creativity, social welfare, sustainable ecosystem and urban landscaping. More green spaces can help mitigate the urban heat island effect and reduce heavy rain runoffs. Therefore the city government encourages people to build gardens on government-owned idle land, private/ public buildings and private business buildings.

Regarding education, students will learn about farming and develop a habit of labor via hands-on experience. They will also learn about plants growing. These activities will encourage students



 First garden city park – Jingqin No.1 Park

to eat locally grown food and give both students and teachers an opportunity to be close to the nature. As they learn to co-exist with the nature, they will be more willing to protect the environment and follow the concept of a green campus and garden city.

Greenhouse Gas Emission Management Strategies

The city has set its GHG reduction targets based on the emissions of 2005 (13.0736 million metric tons), which are 25% reduction by 2030 (to 9.8052 million metric tons) and 50% reduction (to 6.5368 million tons) by 2050 respectively. Emissions reduction strategies include the introduction of "Greenhouse Gas Emissions Reduction Supervisory Briefing", periodic updates of the greenhouse gas emissions information and the promotion of greenhouse gas reduction strategy. Taipei City Government works with other counties and cities in the home/business energy conservation project to encourage the general public to replace non-energy efficient and old appliances with smart energy, increase renewable energy generation, develop electric vehicles and increase green transport. A review on the reduction goal is convened every five years to allow the city to achieve the goal at a steady pace.

Enhance Disaster Reduction/prevention measures

As the impacts of climate change are getting worse day by day, various types of disaster risks have escalated accordingly. On top of this, past disaster response experience shows that further disaster prevention and preparedness enhancement are needed to ensure proper response and recovery at all levels after actions toward expected disaster events.

Therefore, Taipei City Government, through disaster potential simulations and risk analysis, formulates annual stage goals and key disaster prevention projects, such as enhancing the speed and accuracy of disaster monitoring and early warning systems as well as compiling, updating and publishing location-based disaster risk information to serve as reference for decision-makers, the general public and communities with high disaster risks. Taipei City Government implements the most effective way by providing age and demographic-specific disaster prevention education through a diverse array of channels to help all understand the disaster risks at their environment. A comprehensive city disaster prevention plan, evacuation shelters and route planning, periodic maintenance and reinforcement of disaster prevention facilities (retaining wall, embankment, storm water sewer, water pumping station, etc.) have all been implemented. The city government also, based on previous disaster experiences. periodically adjusts disaster prevention strategies, formulates SOPs and checklists, reviews and improves disaster prevention and response policies to ensure the execution of emergency response tasks.



Post-Disaster Recovery and Reconstruction

In order to ensure effective post-disaster recovery planning, protect citizens' lives and property and pursue sustainability of the city, Taipei City Government has included the following in Chapter Four of Taipei City's Regional Plan of Disaster Prevention and Response: post-disaster recovery plan and SOP, necessary financial measures for post-disaster recovery, victim reliefs and compensation, victim placement, reconstruction of infrastructure and public facilities, environmental rebuild, industrial revitalization and stabilization of prices and psychological and life rehabilitation for the victims. Taipei City's primary institutions and public utility have compiled their responsibilities in "Disaster Prevention and Response Execution Plan" and allocated relevant budgets. To accelerate the post disaster recovery plan and boost the efficiency (since there are so many divisions of labor for post-disaster recovery), Taipei City Government drafted the "Taipei City Post-Disaster Recovery Guidelines", which divides the post-disaster recovery into the following items in its nine chapters and 51 sections: disaster investigation and management, necessary financial measures for recovery, victim assistances, victim placement, environmental recovery, reconstruction of infrastructure and public facilities, industrial recovery and revitalization and psychological and life rehabilitation for the victims.

For post-disaster recovery planning, Taipei City Government will evaluate the disaster scale and needs and establish a recovery tasking commission based on Article 37 of Disaster Prevention and Protection Act and Article 7 of Taipei City Disaster Prevention and Protection Rules, with commission members from various city government agencies. In response to Typhoon Nari, Taipei City Government established the "Taipei City Government Typhoon Nari Post-Disaster Recovery Tasking Commission" in 2001 to conduct a full review of the cause of the typhoon and any deficiency in prevention, response, relief, assistance and recovery system. The commission compiled specific advice for improvement, provided counseling and coordinated the recovery efforts. For any major disasters in the future, Taipei City Government will follow the aforementioned protocols and establish a recovery tasking commission to conduct post-disaster recovery planning.

PARTNERSHIPS FOR THE GOALS

SDG 17

Strengthen the means of implementation and revitalize the global partnership for sustainable development

The creation of the Smart City Offices enables policy coordination in departmental units, accelerate administrative progress and resource integration. Industry innovation and smart solutions are promoted through joint efforts of the public and private sector. Opportunities for cooperation and exchanges between cities are created through intensified links with international cities and formation of the "GO SMART" smart city alliances.

Abandoning the traditional top-down budgeting approaches, Taipei City Public Participation Committee was created with an aim to improve budget transparency, raise public awareness and increase citizen participation in public policies and affairs through the adoption of participatory budgeting, which provide citizens with a direct role in the government budget decision-making process, instead of the traditional top-down policy approaches.

City's Current UN Sustainable Development Targets



🎇 17.13 Enhance global macroeconomic stability, including policy coordination and policy coherence

| Indicator | Latest Data | Past Data |
|--|-------------|-------------|
| Annual Average Growth in CPI for the past 3 years (%) | 0.95 (2018) | 0.62 (2017) |

Taipei Smart City PMO Founded

Definitions of a smart city by international organizations all emphasize that a sustainable and livable city is only attainable by integration. Beginning 2003, Taipei City has formulated the "digital city" and "Mobile Taipei" policies and installed broadband infrastructure and wireless application services across the city. In 2007, with vision to build a "Smart City & Quality Life", Taipei City Government upgraded the broadband infrastructure and made its services even more user-friendly. With the current development as foundation and the continuous implementation of the "Smart

City" policy, Taipei City Government established the Taipei Smart City PMO (TPMO) to encourage

the citizens to provide their creativity. The office functions as a platform and aims at strengthening crossdisciplinary, cross-departmental, integration, policy coordination in departmental units, which accelerates the implementation of policies and forms the top-down and bottom-up mechanisms. An additional use of the PoC (proof of concept) provides the environments and opportunities to help industries implement their innovative smart solutions and offer smart services. Public-private partnership and the PoC mechanism have resulted in more than 170 pilot projects, which can promote citizens' welfare with their smart services. Development of long-term and quality service models are the keys to a smart city's sustainability. Therefore, smart services should, during the planning, take into account their future business model, which should assure their sustainability and sound finances. They should also adjust their services in line with technological advancements. Therefore, Department of Information Technology of Taipei City Government has partnered with TPMO and referred the relevant agencies to businesses applying for subsidy/assistance from the central government. The two agencies also encourage these businesses to develop a sustainable business practice to prevent history from repeating itself. Businesses that participated in the smart city projects under local and central government collaboration in the past may solely rely on the subsidy and would shut down operation if the subsidies were ended with no more budgets allocated from the central government. This is why Taipei City Government is doing things differently to ensure that future public services can be sustainable and continue to innovate.

In addition, the Smart City project aims to transform Taipei City into a livable and sustainable city by facilitating public-private collaborations and solving the city's problems with smart technologies. In view of climate change, "change" and "transformation" of lifestyles are the two issues every city has to face. The concept of a "resilient city", which has great disaster tolerance and recovery, has started to gain recognition. Taipei City Government has combined the promotion of smart city and the resilient city concept. Taipei City is set to become a leading city in embracing smart technology applications , and making it livable, sustainable and smart in response to the changes in the urban environment,.

Successful or not, the city will learn precious lessons from the implementation of these policies, which will only make the city better.

Taipei Smart City Industrial Field Pilot Program

The nature of government makes it difficult to stay up-to-date with the industrial technology and information, which resulted in ineffective policy-making to the fullest in terms of information technology planning. In the interim, a lack of platform that enables effective communication between the private and public sector, complicating the process of making innovative proposals for the private sector. In addition, regulatory and procedural restrictions hinder innovative services of private sector from accessing the public sector. In light of the global trend of smart city, Department of Information Technology has established Taipei Smart City PMO (TPMO) to encourage businesses with ICT expertise to provide consultation and advice for the smart city related projects of Taipei City Government. TPMO implements the bottomup model and coordinates with agencies to open their fields and establish an innovative technology matching platform, allowing businesses to experiment with their innovative solutions in Taipei.

When it comes to businesses proposing to implement their smart city applications in Taipei, proof of concept can help them use their proven results as the foundation for the development of future business model and share their experience. Through proposals, business matching and proof of concept, public and private resources can be integrated to propel city construction and other services, allowing Taipei City to be the first city in Taiwan to provide smart services.

For years, Taipei City has been working hard to facilitate PoC projects, including the AI electronic fence project, which led local startup teams to go global by conducting empirical testing in Amsterdam. The Air Box project, after gathering empirical evidence in Taipei, was duplicated to other cities in the nation and even exported to South Korea, Malaysia, India and other markets. A French company used its innovative technology that was used to monitor nuclear power plants and the Eiffel Tower to obtain EU subsidy and came to Taiwan to work with a local company and install bridge structure monitoring system at the Shezi Bridge. These successful cases are true testament to the benefits of inter-city PoC. Therefore, Taipei City proposed "GO SMART" in 2018 as an international platform for exchanges and collaborations for smart cities. This platform connects local governments, industries, the academia, institutes and corporate bodies both domestic and abroad. With local governments providing the fields, policies and even subsidies, the industry, academia, institutes and corporate bodies can provide their innovative technologies, services, and empirical budgets. Intercity PoC projects under publicprivate partnership can promote the development of a smart city, allowing

more innovative applications solve the city's problems and improve citizens' quality of life.

Taipei City, as the founder of the Global Organization of Smart Cities, has invested many resources in this organization. The city, based on the resolution of the GO SMART Preparation and Advisory Commission, became the first chairman of GO SMART (two-year term). GO SMART Secretariat convened the inaugural meeting (180 in attendance), the first general assembly and Strategy Committee meeting on March 27, 2019. The Secretariat, during the meeting, signed a MOU with Local Government Association of Queensland (LGAQ).

Membership application started officially for GO SMART on December 28, 2018. As of June 19, 2019, there are 151 members, with 91 city members from the six major cities in Taiwan, Australia, England, France, the Netherlands, Japan, Brazil and other countries; 54 industry members from Taiwan, France, Hong Kong and Singapore; 5 academic and corporate body members from Amsterdam, Okinawa and other countries. Charles Reed Anderson, current IoT consultant for McKinney & Company and former vice president Asia for International Data Corporation, was invited to be the organization's honorary member. The platform certainly is carrying a lot of global expectations and energy.

As a matching platform for smart cities, GO SMART will continue to play close attention to the latest development trends and enhance public-private partnership to fully utilize the resources, maximize collaborative synergy and connect global partners to build sustainable and mutually-beneficial partnerships.



▲ GO SMART Preparation Office inaugural press conference

Taipei Citizen Participation Committee founded

Participatory budgeting can be traced back to late November in 2014 when Mayor Ko, right after elected, proposed the political ideal of "open government and citizen participation. To a certain extent, this shows how passionate young people in Taipei are about public affairs. The applications of information networks have also been proven effective and powerful in this area.

In order to fully realize the political ideal of "open government and citizen participation", Taipei Citizen Participation Committee was founded on February 24, 2015. The committee has 3 groups: citizen participation, open data and data mining and Participatory Budgeting. The 3 groups work hard to formulate and execute relevant plans projects, from proposal briefing, resident assembly, proposal review and i-Voting, all done by the government instead of being outsourced to contractors. This allows public servants more opportunities to interact with the citizens and ensures a smooth transition between budget allocating and progress updates after a proposal is approved, which has become a main feature of participatory budgeting of Taipei City Government.

Participatory Budgeting

Citizen participation has become a main component of the democratic politics in the 21st century. Participatory budgeting, which combines "citizen participation" and "deliberative democracy", has become popular worldwide. With participatory budgeting, the conventional top-down policy decision-making no longer applies. In addition, it allows government departments, who have the resources, look at things from an angle they otherwise will not with their regular administration processes, which is another step forward for democracy. Participatory budgeting has been promoted for over 20 years. Since 2010, more than 1,500 have been promoting participatory budgeting. The promoters hope that, with citizens participating in certain budget decision-makings of the government, government budget allocation can be more transparent, making the government accountable to the citizens.

Participatory budgeting is a brand new adventure for Taiwan. Taipei City, as a model city, has introduced and been promoting it to further democracy in its operation and realize the ideal of "open government and citizen participation". Moreover, it also helps the city government make policy decisions that better meet citizens' expectations. Participatory budgeting can also facilitate face-toface communications between the city government and the citizens, helping the former formulate policies from citizens' perspective and the latter understand how an administrative organization operates, a win-win for both sides.

By promoting participatory budgeting, Taipei City wants to awake civil consciousness, encourage citizens to generate opinions toward public policies and affairs and thus voluntarily propose better ideas regarding their own environment and public systems, which can help quality of life in Taipei City

to move closer to citizens' expectations. Taipei City's participatory budgeting is based on "enhancing citizen empowerment", "procedure modularization" and "combined budgeting". The "Citizen Proposal & Participatory Budgeting Information Platform" (https://pb.taipei/Default.aspx) was established, which includes participatory budgeting introduction, government-academia alliance, event registration, proposal online and scopes of all the proposals by year. The website helps citizens better know about the city's participatory budgeting. Its key operations and efforts are as follows :

SOP Established

October 22, 2015, Taipei City Government promulgated "Taipei City Participatory Budgeting and Citizen Petition Promotion and Review Operating Procedure", which is the SOP for participatory budgeting. Taipei City is the only city across the nation that has established a participatory budgeting system and then implements it throughout the city.

Government-Academia Alliance

For further and continuous promotion of participatory budgeting, Taipei City Government was the first to form the "Government-Academia Participatory Budgeting Alliance", which includes 9 related departments from public and private universities in Taipei City, 3 premium community colleges in Taipei City, Department of Civil Affairs and various district offices. The alliance combines theory and practice and continues to promote participatory budgeting with the ideal of "locally available, proactively assisting and sustainable operation". The alliance aims to, with professional consultation, promote participatory budgeting to more areas to realize the goal of grassroots democracy.

Education Promotion

In order to help the citizens gain a basic understanding of participatory budgeting and deliberative democracy, develop literacy in deliberative democracy, learn how to file a petition and the core abilities of a reviewer (hosting, keeping meeting minutes and reviewing petitions), Taipei City Government has offered preliminary, advanced and reviewer training courses. These courses combine theory and practice and allow citizens and public servants of Taipei City to learn and grow based on their interests and capabilities. Those who finish required courses can become seeded members of the policy's promotion. Approximately 140 courses were organized between 2016 and 2017 with 6,400 participants.

Consultation desk

In order to make participatory budgeting become part of citizens' daily lives, a special "participatory budgeting consultation desk" was set up at various district offices in Taipei on February 8, 2017. These district offices and the schools in the Government-Academia Alliance will work together to provide six major services, including petition acceptance, drafting of pre-proposal, drafting of proposal, conference registration, course registration and system consultation.

Campus education is a crucial and indispensable part when it comes to civil development. Department of Civil Affairs, Bureau of Education, various district offices, Government-Academia Alliance schools, public/private colleges and universities, public/private high/vocational schools and community colleges all work together to offer "preliminary course" or "preliminary course about resident assembly" at schools that are interested. Students at these schools can, by taking these courses and personal participation, learn about the spirit of deliberative democracy and participatory budgeting. These courses can further civil development and democracy literacy.

Cultural tour aims to help citizens learn about their local culture, history, and ecosystem and develop a vision for the future of the environment. In 2018, the tour included participatory budgeting and held 3 events per district. The wonderful speakers were able to help citizens become more interested in participating in public policies and issues.



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    Petition group discussions
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Cultural Tour •••

Campus

promotion

Participatory budgeting was implemented in 2016 and each year, the city government reviewed its measures in promoting citizen participation to ensure that its policies could meet citizens' needs. For instance, resident assembly was convened for multiple times in each district in 2017, where the process of petition filing for review workshops were simplified to make it easier for citizens to participate. It also made petitions represent their own districts and increased the opportunities for citizens to participate in public decision-making. I-Voting was introduced in 2017 and a total of 93 district-level petitions were submitted via i-Voting and entered the voting process. Statistics show that a total of 57,486 people voted for 71 petitions. In order to make petitions work, the "enforced execution" mechanism was introduced in 2018. With this mechanism, the responsible agency of the city government can start processing a petition without going through the participatory budgeting procedure, thus reducing the burden on the petitioner.

The city government hopes that, by promoting the participatory budgeting system, it will give citizens in Taipei a way to participate in public decision-making and create a wonderful opportunity for effective communications between citizens and the city government. Therefore, other than helping the city government formulate policies that better meet citizens' expectations through public participation in policy-making, Taipei City Government also hopes to build a citizen participation platform that is fair, just and open. Hopefully this platform enables seamless interaction between government and citizens and makes government to understand citizens' needs directly, which is the core spirit of democratic politics.

Global Partnership

In 2005, Taipei City signed the Urban Environmental Accords (UEA) with San Francisco, the United States. The Accords aims to promote the sustainability of an urban environment by proposing 21 actions on 7 issues, including energy, waste reduction, urban design, urban nature, transportation, environmental health and water. Since 2011, a summit is held every two years to allow members discuss their progresses and results in implementing the accord.

Taipei City attended UEA Summit in Iloilo in the Philippines (2015) and Melaka in Malaysia (2017) with "Green City, Livable City" and "Green City, Sustainable City" as the respective themes.

Furthermore, UEA presented the winners for its first City Award during its Summit in 2017. City Award is given to cities that promote best practices in green and sustainable measures. Among 13 topics, Taipei City was able to share its experience on recycling, source reduction, landfill restoration and converting waste into energy as well as the success story with "Taipei Energy Hill", all of which were well received by the participants and recognized by all judges. As a result, Taipei City was awarded with the "Best Practice Award" of the first ever UEA City Award.



▲ Taipei City awarded with "Best Practice Award" of the first UEA City Award

Future Prospect

The Taipei City Government has been formulating its development plans and policies based on "Livable and Sustainable Taipei City", the city's ultimate goal for sustainable development. During the compilation of the Taipei City Voluntary Local Review (VLR), existing sustainable development strategies, the progress of the Council for Sustainable Development and sustainable development indicators were reexamined while aligning its priority objectives, which provided by departmental units of Taipei City, policies, current development and operations with the Sustainable Development Goals (SDGs).

Taipei City will continue devoting its efforts to the three major dimensions of "Engagement of Environmental Regeneration and Resource Circulation", "Promotion of Social Security and Sharing Society", and "Smart Growth of Economy and Technology." The city will concentrate its resources on seven high-priority goals and align its sustainable development progress with the associated targets and indicators of the Sustainable Development Goals. The city government has also been keeping track of the progress to be accountable to its citizens, which is also published on international platforms to further the city's contribution to global sustainable development.

In the future, the city will first enhance the exchanges between its administrative departments and stakeholders in order to work with them systematically in overcoming various challenges of the Sustainable Development Goals. Taipei city hopes that, via these exchanges, it will be able to provide relevant information for both local and global sustainable development.

The civil society and private enterprises are the city's key partners when it comes to achieving various Sustainable Development Goals. The VLR aims to encourage citizen participation in the formulation of high-priority goals as well as selection and evaluation of associated targets and indicators. In the future, the periodic reviews and updates for VLR will expand the involvement of the civil society and private enterprises, and include their opinions on the SDGs as a whole.

The Taipei City Government will continue to update and submit VLR periodically with adjustment for its governance strategies. Taipei City looks forward to working with its global partners toward sustainability.







Annex

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3 GOOD HEALTH AND WELL-BEING

Ensure healthy lives and promote well-being for all at all ages

| | Latest | Past | Target |
|---|------------------------|-----------------|------------------------------|
| Taipei City's Index Corresponding to United Nations SDG | Data | Data | for 2030 |
| Indicator : Immunization coverage (%) Definition : Immunization coverage is the ratio between those who have received and those who should receive immunization for each vaccination. Calculation method : (Flu + rotavirus + elderly streptococcus pneumonia immunization coverage)/4. | 40 (2018) | 38 (2017) | 54.25 |
| Indicator: Physicians (per 100,000 population) Definition: The City Development Index and ISO 37120 both consider the number of physicians per resident an indicator to a city's health and progress. Calculation method: Registered professional physicians/per 100,000 registered residents of the city | 546.6 (2018) | 546.4 (2017) | 526.8 ¹ (2020) |
| Indicator : Suicide mortality rate (per 100,000 population) Calculation method : (Annual suicide mortality/mid-year population) × 100,000 | 1 3.0 (2018) | 11.8 (2017) | <13 |

¹ Number of Registered professional physicians/per 100,000 registered residents of the city is increasing year by year and remains the highest in the nation. Taipei City is ranked only preceded by 4 countries (Qatar, Monaco, Cuba, Greece) for the highest numbers of physicians per 100,000 people. The city's target for number of physicians per 100,000 is 526.8 since the number of actively registered physicians each year fluctuates. The target number has retained the same since it reached the number in 2017 (number of physicians per 100,000 is 526.8)

² This indicator is revised in 2018.

| Taipei | City's Index Related to United Nations SDG | Data | Data | for 2030 |
|-----------------------------|--|-------------------------|------------------------|---------------------|
| •••••• | | • | | • |
| Indicator : | Recidivism rate of drug user under 20 within 1 year (%) | | | |
| Definition : | : (Number of drug users under 20 that have been reported with an estab- lished case or have received judicial treatment in judicial intervention within 1 year of prior offense/Number of drug users under 20 that have been report- ed with an established case within 1 year) × 100% | 5.36 (2018) | _ 2 | <6 |
| Indicator : | Dementia diagnosis rate (%) | 66.63 | 53 | 95 |
| Definition : | Dementia patients diagnosed by contracted hospitals/Number of people re- ceiving dementia screening | (2018) | (2017) | (2020) |
| Indicator | Cancer screening coverage rate (%) | 46.5 | 151 | 50 5 |
| Definition : | Sum of screening coverage rate of colon caner, breast cancer, cervical cancer and oral caner /4 | (2018) | (2017) | 50.5 |
| Indicator : | Average life expectancy (year) | | | |
| Definition : | Refers to average life expectancy of a baby after encountering the death risks of each age group. For life expectancy of age X, it's called "life expectancy of an X-year-old". Average life expectancy usually refers to the life expectancy of O-year-olds. Countries worldwide consider life expectancy a key indicator for the country's basic health, overall social welfare and national competitiveness | 83.57 (2017) | 83.57 (2016) | 86 |
| Calculation | method : Stationary population of the age of O/Number of people living past the age of O | | | |
| Indicator : | Standardized mortality rate (per/100,000 population) | | | |
| Definition : Calculation | By combining different factors (gender, age, city/country, income, occupation, marriage and race) of two countries/regions, it allows an objective observation of how changes of lifestyle and medical care quality truly affect citizens' mortality rate. method: {Σ (Mortality rate by age × Standard population of the age group) }/Total standard population | 316.5 (2017) | 332.8 (2016) | 240 |
| Indicator : | Growth rate in the number of the elderly population with social participation (%) | | | |
| Definition : | Measured by comparing the current year's number of the elderly using the service at community care centers with the number from the previous year. | 2 (2018) | 2 (2017) | 5 (2021) |
| Calculation | method : (Number of participants of this year-number of participants of last year) /number of participants of last year × 100% | | | |
| Indicator : | Day care service rate (%) | | | |
| Calculation | method : Approved number of children under the age of 2 to be admitted to registered daycare centers and the actual number of children under the age of 2 admitted to family childcare service agencies (babysit- ters) /number of children under the age of 2 in the city × 100% | 1 9.33 (2018) | 15.06 (2017) | 20 (2019) |
| | • | •••• | • • • • • | ••••• |

CLEAN WATER And Sanitation

6

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Ensure availability and sustainable management of water and sanitation for all

| Tainei City's In | dex Corresponding to United Nations SDG | | Latest Data | Past Data | Target for 203 |
|--|---|---|-----------------------|-----------------------|-------------------|
| | | | | | |
| Indicator:River b classif | iochemical oxygen demand in line with water ication benchmark achievement rate (%) | | | | |
| Definition: Biologica river's w organic r organic r the base environm | I oxygen demand (BOD) is a representative indicator measurinater quality. In addition to showing the content of biodegrad natter in a river, BOD also indicates the river's level of pollution natter. The higher ratio of river biological oxygen demand measuring value of its water classification, the more likely the city's we not can become sustainable | ng a lable with eting vater | 93.05 (2018) | _ 3 | 95 |
| Calculation method | : Number of monitoring stations showing the river biological of gen demand meeting the baseline value of its water classification the city /Number of monitoring stations × 100% | oxy- ation | | | |
| Indicator:Tap wa | ater quality achievement rate (%) | | | | |
| Definition: The percession Samples | entage of qualified samples of tap water to the total numberested. | er of | 100 | 100 | 100 |
| Calculation method | : (Number of qualified tap water samples/number of tap w quality samples) × 100% | ater | (2018) | (2017) | |
| Indicator : Wastev | vater tertiary treatment ratio (%) | | | | |
| Definition : The ration and the t | between the wastewater that has received three-stage treatr otal amount of wastewater collected. | nent | 0.90 (2018) | 0.67 (2016) | 0.90 |
| Calculation method | : Wastewater that has received three-stage treatment/t amount of wastewater collected × 100% | otal | | | |
| ••••• | | •••• | •••• | | |
| Taipei City's I | ndex Related to United Nations SDG | La | ata | Data | for 203 |
| Indicator:Amount | of wastewater with diverse treatment (m ³) | • | · | • | |
| Calculation method | • As this indicator declines, it means that the percentage of dry-weather flow of wastewater is reduced gradually and the flow is redirected to water treatment facilities for processing. | 9,41 (| 2,665 2018) | 4 | 14,155,8 |
| | • Calculate the annual amount of processed wastewater at on-site contact bed treatment facilities. | | | | |
| ³ The data in 2017 is from the data source in 2018, leading 4 ⁴ This indicator is a new one and the source of th | on-site contact bed treatment facilities. Taipei City public transportation statistics, while it was changed to Greater Taipei o no data available in 2017. Ided in 2018 | public i | transporta | tion statist | ics as i |

| Indicator : Tap water supply system leakage rate (%) Definition : The ratio between tap water leaked (due to broken/burst pipes as the result of fragile soil, old pipelines and excessive traffic load) and total water supply. Formula : Amount of water leaked/Total water supply × 100% | 1 3.52 | 1 4.18 | 10 |
|---|------------------------|-----------------|--------------------|
| | (2018) | (2017) | (2025) |
| Indicator : Reservoir water utilization rate (%) Definition : • The ration between the total amount of water utilized from Feitsui Reservoir and the total amount of water discharged from the reservoir. • 'Water utilized' refers to the water discharged to supply the public or for power generation. Formula : Amount of water from Feitsui Reservoir utilized/amount of water discharged by Feitsui Reservoir × 100% | 89.86 | 89.66 | 89.79 ⁵ |
| | (2018) | (2017) | (2030) |
| Indicator : Percentage of city population served by wastewater collection (%) Definition : The sum of households connected to the public sewage systems, number of buildings with their dedicated sewage treatment facilities and the number of buildings with regular wastewater treatment facilities *household sizes/population Formula : Total population served by wastewater collection/Total city population × 100% | 82.81 (2018) | 81.43 (2016) | 86.98 |

⁵ This target number uses as the annual mean (89.68) from 2016 to 2018 as baseline value, and it is set as 89.68 in 2019, which increases 0.01 each year till it reaches 89.79 by 2030.



SDG 7

Ensure access to affordable, reliable, sustainable and modern energy for all

| Taipei City's Index Related to United Nations SDG | Latest | Past | Target |
|---|----------------------|----------------------|-----------------|
| | Data | Data | for 2030 |
| Indicator : Annual increase in photovoltaic installed capacity (kWp) Definition : Annual increase in installed capacity for photovoltaic power generation equipment (including organizations, schools, the central government and private sector) | , 9,951 (2018) | , 3,572 (2017) | 3,100 (2022) |
| Indicator : Annual photovoltaic power generation (kWh) | 17,174,162 | 8,094,221 | 27,375,000 |
| Calculation method: Annual photovoltaic power generation (kWh) | (2018) | (2017) | (2022) |

SUSTAINABLE CITIES AND COMMUNITIES

Make cities and human settlements inclusive, safe, resilient and sustainable

| Taipei City's Index Corresponding to United Nations SDG | Latest Data | Past Data | Targe for 20 |
|---|-------------------------|-------------------------|----------------------|
| Indicator : Annual number of public transport trips per capita Definition : Transport trips of buses, MRT, HSR, Taiwan Railways, highways and highway buses. Calculation method : Number of public transport trips/city population | 463.24 (2018) | 6 | 486.6 (202 |
| Indicator : Numbers of fire related deaths per 100,000 population Definition : Number of fire deaths within 30 days Calculation method : Fire related deaths × 100,000/city population | 0.600 (2018) | 0.819 (2017) | <0.24 |
| Indicator : Estimated damage by natural disasters (NTD\$1,000) Calculation method : The sum of estimated damage resulting from mud slides, ty- phoons, earthquakes, forest disasters and other natural disasters. | 44,213 (2018) | 73,614 (2017) | 72,16 |
| Indicator : Total municipal solid waste generation per capita per year (ton/person-year) Calculation method : (Annual amount of waste processed by the incinerators +Amount of recycled waste+ amount of reused bulky waste + recycled kitchen waste)/annual average population of the city | 0.463 (2018) | 0.464 (2017) | <0.45 |
| Indicator : Annual average concentration of fine particulate matter (PM2.5)(µg/m ³) Calculation method : The average number from 24-hour monitoring of PM2.5 at the two air quality monitoring stations. | 1 4.6 (2018) | 1 5.3 (2017) | 1 |
| Indicator : Green space (hectares) per 100,000 population Definition : Green space (including natural, semi-natural, parks and other open spaces (larger than leisure spaces by definition) regardless whether or not accessible to the general public or is part of a protected area) accessible for each 100,000 citizens of the city. Calculation method : (Developed park, green space, children playgrounds, squares, riverside parks, protected areas, scenic areas, area of the Yangmingshan National Park in the jurisdiction of Taipei City and other areas/ city population x 100,000 | 533.66 (2018) | 523.64 (2017) | 508.0 |

⁶ The data in 2017 is from the Taipei City public transportation statistics, while it was changed to Greater Taipei public transportation statistics as a data source in 2018, leading to no data available in 2017.

⁷ An estimated number of averages for the last 3 years (2016-2018).

⁸ An estimate using the estimated population in 2030 (2,809,918) from Department of Civil Affairs.

| Taipei City's Index Related to United Nations SDG | Latest Data | Past Data | Target for 2030 |
|--|--------------------------------|-----------------------------|------------------------|
| | | | |
| Indicator: Number of public bicycles used (10,000 times) | 2.625 | 2.195 | 2.835 |
| Calculation method:The sum of the number of public bicycles used per year | , (2018) | (2017) | (2022) |
| Indicator:Percentage of days with excellent air quality index (AQI) (%) | 55.6 | 57 | 56 |
| Calculation method : Number of days of station with excellent air quality/number of effective days of station | (2018) | (2017) | (2022) |
| Indicator:Number of electric buses | 22 | 9 | 400 |
| Definition : Number of electric buses running in the city | (2018) | | (2022) |
| Indicator : Penetration rate of smart bus stop signs (%) | | | |
| Definition : Smart bus stop signs provide bus information to passengers who have no access to smart phones. | 76 | 61.1 | 100 |
| Calculation method : Number of bus stops with smart signs/Number of bus stops that can install smart signs × 100% | (2010) | (2011) | (2020) |
| Indicator:Number of trips of wheelchair-accessible taxi per year | | | |
| Definition : Number of trips of wheelchair-accessible taxi to assist the elderly, disabled and handicapped to go to the doctor, get to the office, go to school, go out for fun or go shopping, which is a key component of all-accessible transport. | 161,634 (2018) | 104,620 (2017) | 220,000 |
| Indicator:Number of trips by paratransit buses per year | | | |
| Definition : To further social welfare and take care of the handicapped, paratransit buses provides accessible transport for the handicapped. | 677,525 (2018) | 691,755 (2017) | >670,000 ¹⁰ |
| Indicator : Percentage of children of low-income household receiving school commute subsidy (%) | 65 90 | 66.88 | 50 ¹¹ |
| Calculation method : Number of subsidy recipients of the year/Number of qualified people of the year × 100% | (2018) | (2017) | |
| Indicator:Number of the elderly using the public transport | | | |
| Definition : Elderly card (of Easy card) holders have 480 credits each month for riding buses, MRT, taxi, YouBike, double-decker sightseeing bus and other transportation tools. This indicator measures how many elderly people use public transportation systems each month. | 11 4,857,33 1 (2018) | 92,042,896 (2017) | 164,022,680 |
| Indicator: Low-income population percentage (%) | 1.70 | 1.71 | 1.7 |
| Calculation method : Low-income population of Taipei City/Total population of Tai- pei City × 100% | (2018) | (2017) | |
| ⁹ The city's electric buses have hit the road and started operation beginning 2018, therefore no data available in 2017. | | •••• | ••••• |

¹⁰ In order to follow the city's policy of retaining the number and the scale of paratransit buses, a target of 670,000 trips per year has been set.

Annex

¹¹ This target number of subsidy-recipients Taipei City-born children for the following 10 years is estimated using the city's birth rate.

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Ensure Sustainable Consumption and Production Patterns

| 00 |) Taipei City's Index Corresponding to United Nations SDG | Latest Data | Past Data | Target for 2030 | |
|----|---|------------------------|------------------------|--------------------|---|
| | Indicator : Annual average amount of collected hazardous waste per capita (kg/person-year) | , | | | |
| • | Definition : Hazardous waste refers to the hazardous waste disposed by institutions (schools, hospitals and government buildings) | 3.49 (2018) | 3.22 (2017) | 3.9 | • |
| • | Calculation method : Amount of hazardous waste reported for collection/Taipei City annual average population | | | | • |
| | Indicator : Recycling Rate (%) Definition : The percentage of recycled resources to processed waste. | 64.42 (2018) | 62.02 (2017) | 65.5 | |

13 CLIMATE ACTION

SDG13 Take Urgent Action to Combat Climate Change and Its Impacts

| | Taipei City's Index Related to United Nations SDG | Latest Data | Past Data | Target for 2030 |
|--|--|---------------------------|----------------------------|--------------------|
| | Indicator : Area with permeable pavement (m²) | | | |
| • | Definition : Total area with permeable pavement on sidewalks, parks, squares, campuses and parking lots. | 44,027 (2018) | 33,221 (2017) | 44,000 |
| • | Calculation method : The total area with permeable pavement in a year. | | | |
| • • • • • • • • • | Indicator : Greenhouse gas emission (ten thousands tonnes of CO ₂ equivalent) Definition : Update Taipei City's greenhouse gas emission number based on EPA's *County/ | 1,211.36 (2018) | 1 ,261.64 (2017) | 980.52 |
| | City Level Greenhouse Gas Inventory Guidelines". The emission factor is based on 6.0.3 version of the "Greenhouse Gas Emission Factor Table" published on the EPA's national GHS registry platform. Electricity emission factors are based on Bureau of Energy's published numbers. | | | |

| Indicator : GHG Annual Reduction Rate (%) | | | |
|--|--------------------------|---------------------------|------------------------|
| Definition : Greenhouse Gas Reduction and Management Act was promulgated in 2016, which aims at a 50% reduction in GHG emission by 2050, with 2005 as the baseline. Taipei City mid-term goal is to have 25% reduction by 2030 and 50% reduction by 2050 (both compared to 2005). | 7.34 (2018) | 3.49 (2017) | 25 |
| Calculation method : • (2005 GHG emission - GHG emission of the year)/ 2005 GHG emission × 100% • 2005 GHG emission : 1,307.36 (ten thousands tonnes of CO2 equivalent). | | | |
| Indicator : Total farm base area (m²) Definition : • The area of newly built farm bases and added area to existing farm bases. • Total added area to farm bases in the year. | 142,114 (2018) | 1 40,190 (2017) | 214,120 |
| Indicator: Water retention of base (m3) Calculation method: Water retention of all the developed public and private land. | 6,488 (2018) | 1,700 (2017) | 2,000 (2020) |

PARTNERSHIPS For the goals Strengthen the means of implementation and revitalize the global partnership for sustainable development

| | Taipei City's Index Corresponding to United Nations SDG | Latest Data | Past Data | Target for 2030 | |
|---|---|----------------|----------------|--------------------------------|---|
| • | Indicator : Annual Average Growth in CPI for the past 3 years (%) | | | | |
| • | Definition : Average annual inflation for the past 3 years | 0.05 | 0.00 | - 0 0 0 ¹² | • |
| | Calculation method: {(Consumer price index of the year/Consumer price index 3 years | 0.95 (2018) | 0.62 (2017) | ≥ 2.00 ¹² (2020) | • |
| | ago) cubed-1} × 100 | | | | • |
| | • | | | | • |

¹² National Development Council set average consumer price index rate below 2.0% by 2020, therefore the annual inflation rate is also set below 2.0%.



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Partner : Foundation of Taiwan Industry Service

 Image: Substainable structure
 Subs