2021

臺南市永續發展目標自願檢視報告

Tainan City Sustainable Development Goals Voluntary Local Review

Content

Letter from the Mayor

Over the past two years, the world has been confronted with the social and economic impacts brought by the Covid-19 pandemic. Tainan City has actively implemented measures for pandemic prevention and containment, effectively reducing its influence. At the same time, natural disasters caused by extreme weather, including the urban heat island effect, water shortage, and floods, have shown us the extreme effects of climate change; the importance of sustainability has become a global consensus.

Since taking office, I have been pressing ahead with the plans for the City's development step by step based on the strategy of "3 improvement goals and 3 sustainability goals," in striving to make sure the citizens of Tainan can live and work in comfort and contentment. We see low-carbon adaptability and sustainable development as the City's important policies for actively promoting green energy and carbon reduction. Tainan was the first city in Taiwan to formulate the "Self-Government Ordinances for a Low-Carbon City." From urban planning to design review, we include relevant concepts, such as rainwater detention, green coverage rate, circular economy, friendly traffic, and renewable energy to build a resilient, low-carbon and sustainable city. With resources from industries, government agencies, and academia, we formed the Tainan City Low-Carbon Adaptability and Sustainability Committee to supervise, revise, and examine our sustainability strategies in multiple stages.

Tainan has a complete green supply chain. We launched the Solar City project by making good use of sunlight. The backup solar PV capacity reached 2.41GW by the end of October. Employing either rooftop or ground-mounted facilities, the installed capacity produced in Tainan ranks first in the nation. Since I took office, it has even substantially increased by 1.5GW. Sinji Industrial Park is the first industrial park built after the merging of Tainan City and Tainan County. It is also Taiwan's first new-century industrial park that has zero discharge of polluted water and aims to strike a balance between the environment and economy. This September, Taiwan's first carbon negative demonstration plant was launched in Tainan. It is predicted to help corporations reduce greenhouse gas emissions and increase benefits brought by a green economy.

Tainan's greenhouse gas emissions have decreased by more than 20% since 2010. In the face of the climate crisis and trends of a net zero carbon world, I officially signed a climate emergency declaration this May and put forward the objectives of sustainable development for 2030, including: renewable energy capacity reaching 4.5GW, carbon neutrality for residential and commercial energy consumption, and complete adoption of electric buses in the City. In the future, we will continue to

promote the establishment of renewable energy, increasing natural gas usage and reducing coal consumption, water reclamation, and featured buildings. We will integrate resources from universities, research institutes, and industries to build the Shalun Smart Green Energy Science City, and work with corporations to achieve a zero carbon Tainan in striving towards achieving the goal of zero carbon emissions by 2050.

Tainan has outstanding manufacturing and technological capabilities. More importantly, during the process of democratization, the City has developed the awareness of human needs and environment protection, which will help Tainan become a new example in the new era of sustainable development. Net zero transition is a just transition, in which not only leading enterprises can participate, but also small and medium-sized enterprises, traditional industries, and everyone concerned.

Sustainable development signifies the balanced implementation of environmental protection, economic development, and social equality. Tainan City is willing to support global sustainability initiatives with practical actions and to disclose the City' s sustainable development report. In 2021, we disclosed 10 sustainable development goals and 55 sub-goals and set up standards for continuous re-examination. The report will be used as a guide for inspecting the City' s implementation status of sustainable development and making improvements in various departments/bureaus so that we can strive together for the environment and future generations. Let us continue moving forward towards sustainable development.

1 Introduction

The Sustainable Development Agenda

Humans are facing enormous challenges, such as the negative impacts brought about by poverty, inequality, unemployment, the depletion of natural resources, and environmental degradation. Among all of these, climate change is the most menacing. In order for the world to move towards a sustainable and resilient future, the UN has determined to launch reform measures. In September 2015, the UN officially announced the 2030 Sustainable Development Agenda, which came into effect on January 1, 2016.

The Agenda was formulated for people, the planet, and prosperity; it aims to strengthen world peace and build partnerships between countries, cities, and stakeholders around the world. The implementation of the Agenda must be done without delay to make sure the world moves towards a sustainable, livable future.

People

Emphasis on eliminating all types of poverty and hunger to ensure human dignity and equality.

Prosperity

Ensuring social prosperity and economic development can co-exist with nature.

Planet

Ensuring social prosperity and economic development can co-exist with nature.

Peace

Nurturing a peaceful, just, and inclusive society.

Partnership

Strengthening partnerships between countries and organizations.

The sustainable development goals include 5 major aspects

Introduction to Sustainable Development Goals (SDGs)

After negotiating and discussing with various parties, the UN concluded with 17 Sustainable Development Goals (SDGs). Each core goal comes with several targets that specifically point out the challenges the world is faced with. This list of goals flexibly takes into consideration the situations of various countries around the world. Each country should incorporate these goals into its domestic policy and action plans based on its national circumstances and state of development. As a member of the global community, Taiwan has made good use of this framework by putting forward 18 core goals based on the concepts of the SDGs, our national circumstances and overall environment.

Tainan is the oldest city in Taiwan, and we hope to evaluate our policies through Taiwan' s sustainable development objectives in the midst of rapid global development. We have incorporated the key concepts of the SDGs into Tainan' s sustainable development objectives, which aim to implement the important principles of focusing on people, planet, and prosperity, set up sustainable development ideals, and ensure both the City' s current citizens and the next generation can enjoy a wonderful home.

The UN' s 17 SDGs

攝影：翁宗憲

Tainan City's Environmental Policy

An International City with Both Culture and Technology

Tainan is located in southern Taiwan. It was the first developed region and the oldest city in Taiwan. After the merging of Tainan County and Tainan City in 2010, it was upgraded to a special municipality, one of six in Taiwan.

Tainan, as a cultural old city, has the most museums in Taiwan. Moreover, there are relics everywhere. Some people say that this feature is a "sweet burden" in terms of public works. Some constructions have to be stopped halfway for review when relics are found during excavation.

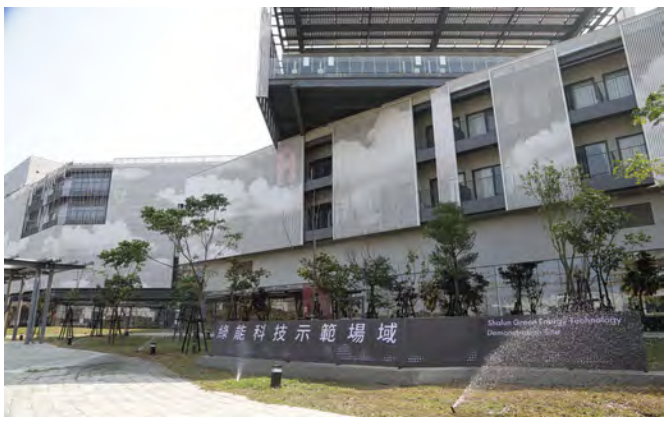
Even when the excavation of the large sugarcane field intended for the construction of Southern Taiwan Science Park, whose current output is worth 820 billion NTD, began 20 years ago, the operation had to be called off because of an archaeological discovery. Only after all the challenges were overcome did the Park slowly transform into a semiconductor hub of Taiwan today.

City construction and development necessitates determining how to combine "culture, historic landmarks" and "technology", an essential issue in developing Tainan; Tainan's transformation today is based on the efforts that all the former mayors had made. Tainan's transformation today is based on the efforts that all the former mayors had made. Mayor Huang said, "Tainan will be 400 years old in 4 years. My goal is to let the world see Tainan."

An International City with Both Culture and Technology

The five major themes of the Tainan city development plan include: "cultural center", "economic hub", "smart city", "urban and rural revitalization" and "hopeful hometown." The City Government must strive to make citizens feel the results of its efforts and assist corporations in investing and setting up factories in Tainan so as to transform Tainan into an international city step by step.

The total amount of investment made in the TSMC 5-nm and 3-nm processes in Tainan is 1.15 trillion NTD, which increases 9,000 job opportunities in Tainan City, not only attracting leading international companies to establish branches in Tainan, but also making the City the largest and the most advanced semiconductor industry cluster in the world. At the same time, this will create 72,000 jobs from the sectors of semiconductor-associated equipment, materials, support, and services. Apart from Southern Taiwan Science Park, where technology companies gather, there is Anping Harbor in Tainan. With the average tidal change being only 0.57 meters, Anping Harbor is a very good natural harbor; to the west of the Harbor lies Yuguang Island, which protects the Harbor from waves. It is an excellent harbor surrounded by calm waters and the best place for developing water sports and setting up a yacht marina in Taiwan. The City aims to transform Anping Harbor into an international yacht city by integrating the yacht industry chain to build a demonstration base and bring prosperity to the old city of Tainan through Anping Yacht City. Mayor Huang stressed that Tainan will attract satellite manufacturers to invest in Tainan with Southern Taiwan Science Park and the Shalun Smart Green Energy Science City. Also, it is expected to bring in investment from industries with low pollution, low energy consumption, and high added value, thereby creating more jobs, encouraging young people to return home from northern Taiwan, and facilitating the development of the greater southern region.



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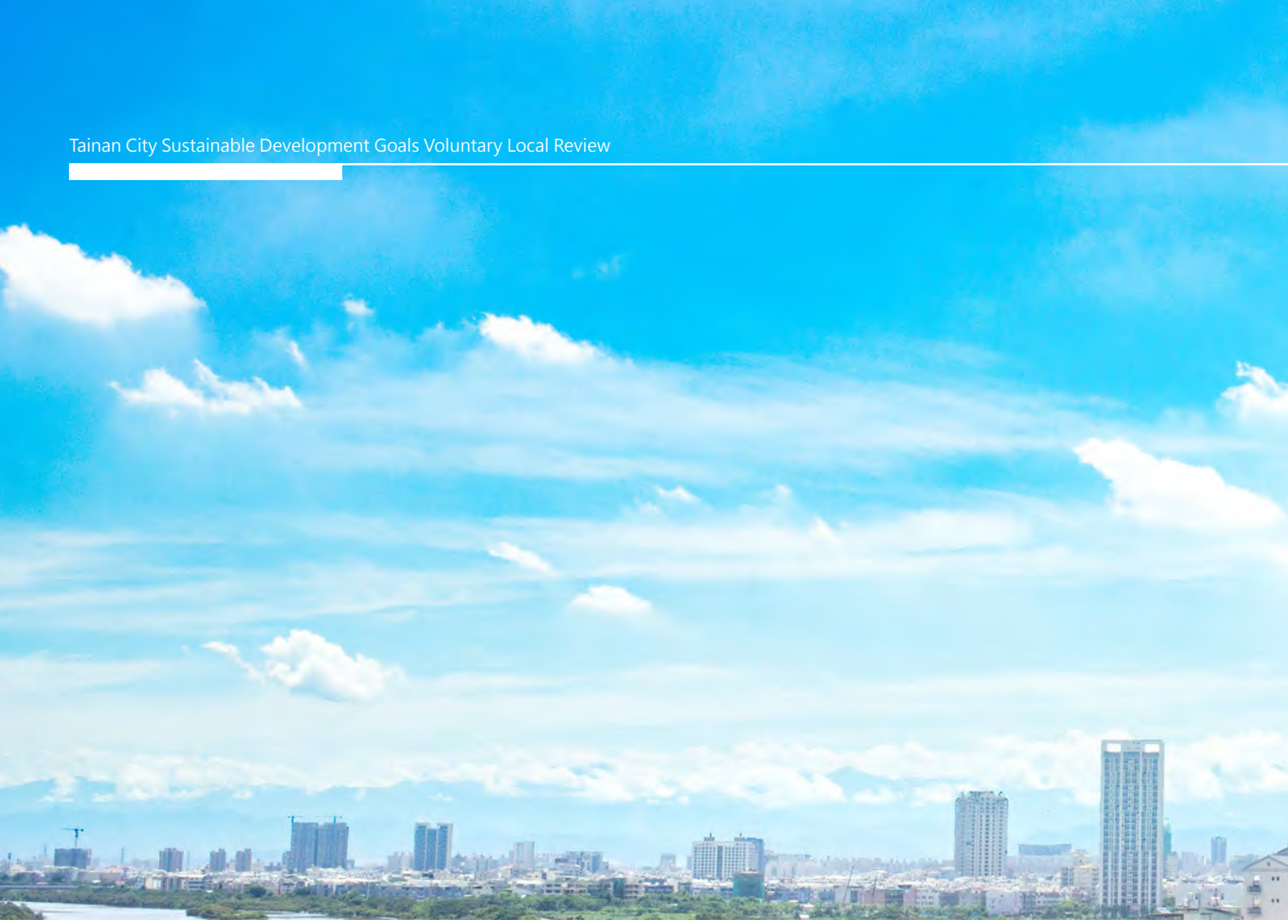


Circularity & Sustainability in Tainan Creating A Livable City

We have only one earth. Therefore, industrial development should transform itself from a linear to a circular economy. Tainan City Government has been actively maintaining the environment, improving air quality, and promoting circularity, striving to build a livable, exemplary city in Taiwan. Tainan City has introduced the "Bright Sky Plus" project. After the project was launched, the number of blue days (AQI≦50) from January to November 2021 increased by 13.6% compared to that of 2020. Over the past 10 years, the PM improvement rate was up to 50%. Tainan City Government has strived to reduce the sources of pollution within the City. In regard to industries, 538 industrial oil-fired boilers were replaced by gas-fired boilers, the highest ratio of replacement in Taiwan.

In addition, due to climate change and global warming, the City's rainstorm intensity and frequency have been increasing, and temperatures have risen to alarming levels consecutively. In Taiwan, one-third of the flood-prone areas are located in Tainan. The City's high temperatures are also often the nation's highest. Thus, the implementation of the City's policy should help us learn to co-exist with extreme weather. In the face of flood disasters caused by short and rapid rainfall, we should prepare for and be aware of flood control. When a flood occurs, ordinary parks will be transformed into temporary detention basins. The daily community activities should then involve independent disaster prevention training and lessons on how to use flood barriers. People can also download the Water APP designed by the government to keep track of images of the flood discharge and streams in the neighborhood and to receive alerts on bridge status.

As Tainan' s dry season continues to lengthen, traditional markets have been equipped with rainwater harvesting storage tanks and the agricultural sector has put more emphasis on the distribution of irrigation water. Tainan City Government has also actively made a commitment to the central government to save water. From the semiconductor industry to the car wash industry, industries are provided with reclaimed water as a water map is created for people to retrieve free and clean reclaimed water. With a net zero carbon goal, Tainan pays enormous attention to the increasing use of renewable energy. Meanwhile, since the most advanced 5-nm process and semiconductor ecosystem in Asia are situated in Southern Taiwan Science Park, Tainan' s electricity consumption per capita continues to rise. Therefore, Tainan has worked hard to promote clean energy. Now the installed capacity of renewable energy has exceeded 2.4GW, equivalent to the capacity generated by two electric generators of Taichung Power Plant, and its goal is to exceed 4.5GW by 2030. Government agencies, schools, and sports venues are encouraged to set up rooftop PV systems to reduce air conditioning use by lowering the indoor temperatures. Also, through green energy, funds can be acquired for renovating these official buildings, and helping remote regions gain their own sources of income.

The impacts brought by global climate change have made cities the main battlefields for combating extreme weather. Determining how to respond to such an enormous challenge has become an essential issue in urban governance. To realize the vision of a "sustainable and livable Tainan," the City Government reviews its policies and strategies. Through these policies and strategies, Tainan aims to formulate concrete action plans in accordance with the UN SDGs, while putting emphasis on building a green, livable city and striking a balance among environment, energy, and economy. Also, it is hoped that the awareness of energy sustainability can be incorporated into the daily lives of Tainan' s citizens in order to create a sustainable living environment.

II.

The benchmark actions for sustainable development

Solar City 2.0

Background

Tainan City Government launched the Solar City Project in 2011, which originally aimed to reach 1 GW of solar photovoltaic installation by 2021. The original target was reached in 2019, two years ahead of schedule. Upon taking office, Mayor Huang Wei-che expanded the project into "Solar City 2.0 Project", with the aim of accelerating the development of renewable energy in Tainan. It' s expected that the City Government can work with various platforms and ministries/councils to remove unnecessary obstacles, assist enterprises in building green power, and establish the position of Tainan Solar City.

Tainan Solar City converts solar energy into electricity with 4 major advantages

Tainan is an excellent city for the development of green energy. Compared to other cities or counties, Tainan has the exceptional advantage of sunshine conditions as it has 2,596 hours' mean annual sunshine. In order to improve the administrative efficiency of public services, a single service window has been established to accelerate operations. At the same time, Tainan has a complete green energy production chain laying an industrial foundation that connects up-, mid- and down-stream green energy suppliers to realize the establishment of Tainan Solar City step by step in a systematic manner. In line with the Central Government' s 5+2 Industrial Innovation Promotional Plan, this will become the core driving force for the growth of the next generation industries and give new impetus to its economic growth.

10 major promotional strategies and items

Upon taking office in 2019, Mayor Huang Wei-che expanded the original project into the "Solar City 2.0 Project", requesting the City' s agencies (units) to strengthen their review of public building roofs, implement demonstration settings, and provide support with all-around strategies, including: publicity and promotion activities, subsidies and incentives, financing options, regulatory enforcement, modification of illegal structures, green energy rooftops, equipment certification, promotion center and information platform, while promoting solar photovoltaics in five rooftop types (solar official buildings, solar roofs, solar communities, green factories and farm sheds), and five ground-mounted types (salt fields, water spaces, landfills, green energy lands and green energy facilities).

Solar City with 10 promotional strategies

Green Energy Rooftops	• Active participation in the central government' s "Green Energy Roofs Project" • Completed the selection of operator(s) for Tainan City • A minimum of 10% feedback fund
Law enforcement	• In accordance with the Tainan City Self-Government Ordinance for a Low-carbon City - By Article 21, two low-carbon demonstration communities are to be set up in An-nan Jiufenzi Community and THSR Tainan Station Special District - By Article 23, users with power usage contract capacity over 800 kw should set up a solar photovoltaic system to generate at least 10% of the contract capacity • In accordance with land control regulations in the Urban Planning Law, installation of photovoltaic system in the Shanhua LM Special District will be included in the floor area ratio bonus, with a maximum of 20% of the basic floor area
Subsidy & Incentives	Formulated the "2021 Subsidy for the Implementation Plan of Solar Photovoltaic System Installation" and assigned a budget of NT$20 million to subsidize the installation of photovoltaic systems in legal private buildings
Financing Projects	Active coordination with banks to set up photovoltaic financing projects
Local certification	First among all counties and cities in Taiwan to adopt certification for photovoltaic facilities
Advocacy	• Organized a total of 250 sessions of renewable energy-related explanatory meetings, investment promotion conferences, seminars, visits, and observations
Demonstration Installation	Tainan is the first among all counties and cities in Taiwan to lease by tender official buildings for installation of photovoltaic systems, and actively seeks official buildings for renewable energy installations in government agencies at all levels and schools
Modification of Illegal Structures	• According to the regulations of the Central Government on consulting installation of photovoltaic systems on illegal roof structures of legal buildings, 396 consultation forms have been issued, in which 215 cases have been approved and put on file, with the installation capacity exceeding 23MW.
Promotion Centers	Established "Green Energy Technology Industry Promotion Center" to eliminate investment obstacles
Information Platform	Established the Integration Platform for Information on Tainan City Renewable Energy and the Map of Renewable Energy

Encourage Major Electricity Users to Switch to Green Energy

Tainan City announced on December 22, 2012, the implementation of the "Tainan City Self-Government Ordinance for a Low-carbon City", in which Article 23 stated that "...a user with a power usage contract capacity of 800 kW or more (up to 4999 kW) is required to set up photovoltaic systems to generate at least 10% of the contract capacity." It is expected to declare a total of 681 companies in 2022, generating nearly 200 million kWh of electricity every year, and reducing carbon emissions by 100 thousand metric tons. It is hoped that through participation in green energy conversion, the large electricity users can fulfil their corporate social responsibility, while encouraging Tainan citizens to respond to the installation of solar power generation systems collectively, thereby facilitating the practice of energy transformation.

All-inclusive Access to Green Energy Information

In order to achieve the goal of energy transformation, not only will the City Government continue to promote the Solar City 2.0 Project, but also emphasize the removal of obstacles to investment in green energy to create a friendlier environment for green energy investment. It is hoped that the public and manufacturers can understand and inquire about the City' s latest information and policy on green energy in a timely manner. The City Government is striving to build a service network for the Integration Platform of Information on Tainan City renewable energy, which includes the Solar City Information Network, the Integration Platform of Information on Renewable Energy, and the Information Map on Renewable Energy. Tainan makes full use of information management technology to set up the Solar City Information Network, the Map, and the integration platform on Renewable Energy, implementing systematic management from information disclosure to internal management examinations. In the future, the City' s real-time power generation information on green energy rooftops will be gradually added for real-time data reporting on the daily power generation. Through dashboard and charts, the public and manufacturers can monitor whether their equipment is working properly, and easily calculate the feedback to receive funding.

Solar Panel Roof in the Parking Lot of Yonghua Civic Center

In addition, as there is increasing concern about ecological environment issues, the City Government has added maps on environmental and social inspections on top of the original maps of the environmentally sensitive areas (levels 1 & 2), and through the overlay of the site to be installed and the map information in the map platform and the quick screening procedure system of the environmental and social inspection, possible issues of sites for potential development can be identified, further speeding up the installation of photovoltaics for sites with little or no concern. Combined with the application procedures of the power industry, and supplemented with the operation of the consultation committee, it is anticipated that a balance could be maintained between photovoltaic development, and society' s and the environment' s prosperity.

Google completes its first Asian green electricity transaction in Tainan

International corporations' commitment to the use of 100% renewable energy has become a trend, in which their suppliers are required to use renewable energy, thereby driving an international green supply chain. In 2019, Google subscribed for a 10MW renewable energy power in the Beimen District Fishery and Electricity Symbiosis Project in Tainan, which will be the power source of Google's newest database in Asia. It's Google's first renewable energy transaction in Asia, in which Taiwan's first "Renewable Energy Power Purchase Agreement" has been signed, proving that Taiwan's effort to promote the green energy model has gained the trust of international corporations.

Floating Photovoltaics

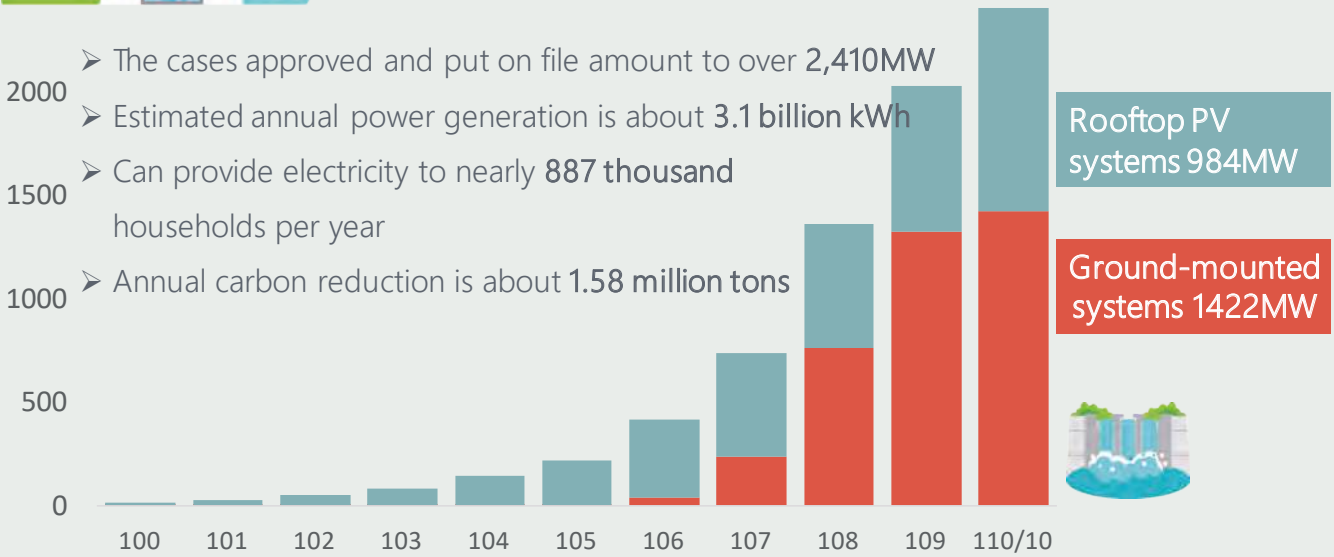
Taiwan's No. 1 Solar City in the Installed Capacity

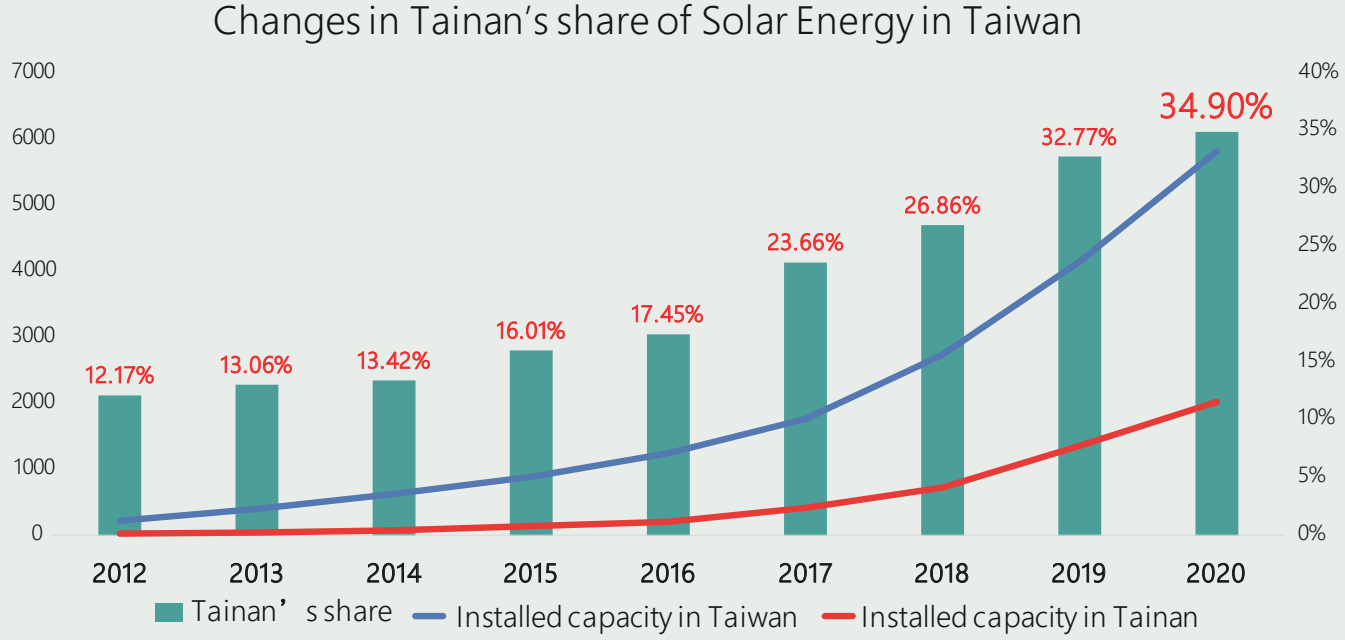
As of October 2021, 9,060 cases of applications for solar photovoltaic installation were approved and put on file, with a capacity of 2.41GW and an estimated annual power generation of about 3.1 billion kWh, which is equivalent to the annual power generation of over 11 Zengwen Hydroelectric Power Stations and can provide electricity to nearly 887 thousand households per year. The annual carbon reduction will be about 1.58 million tons, equivalent to the carbon reduction made by 4,862 Tainan Parks, and the investment amount attracted is near NT$168.4 billion. It is expected to reach the goal of 3.25GW solar energy cumulatively by 2025, and 4.5GW by 2030.

Tainan's photovoltaic installed capacity over the years

【Taiwan's No. 1 in installed capacity】

- The cases approved and put on file amount to over **2,410MW**
- Estimated annual power generation is about **3.1 billion kWh**
- Can provide electricity to nearly **887 thousand** households per year
- Annual carbon reduction is about **1.58 million tons**




Changes in Tainan's share of Solar Energy in Taiwan
7000
6000
5000
4000
3000
2000
1000
0
40%
35%
30%
25%
20%
15%
10%
5%
0%
12.17%
13.06%
13.42%
16.01%
17.45%
23.66%
26.86%
32.77%
34.90%
2012
2013
2014
2015
2016
2017
2018
2019
2020
Tainan's share
Installed capacity in Taiwan
Installed capacity in Tainan

Control over Greenhouse Gas Emissions

Background

Tainan City has been controlling greenhouse gas emissions for ten years. Through the promotion of the "Low-carbon City Construction Plan" since 2011, a series of greenhouse gas reduction control measures have been implemented. Promulgation of the "Tainan City Self-Government Ordinance for a Low-carbon City" in 2012 made Tainan the first city in Taiwan to incorporate greenhouse gas control into its administration policy. In 2013, the "Tainan Low-carbon Adaptation and Sustainable Development Committee" was established to promote the construction of a low-carbon city through a dedicated organization.

Currently, Tainan City is working on the cross-department/bureau promotion of the "Implementation Plan of Greenhouse Gas Management", which formulates corresponding control strategies for different departments and bureaus in the hope of continuously moving to realize the vision of a low-carbon homeland.

Tainan City's Progress in the Reduction of Greenhouse Gas Emissions

Greenhouse Gas The history of the control measures

In 2011, promoted **the Low-carbon City Construction Plan**

In 2012, declared **the Low-carbon year one** and promulgated **the Self-Government Ordinance for a Low-carbon City**

In 2013, established **the Low-carbon Adaptation and Sustainable Development Committee**

In 2014, completed **the Low-carbon City Promotion Performance Report**

In 2015, promulgated the Greenhouse Gas Reduction and Management Act

In 2016, **low-carbon city transition (Construction plan → Implementation plan of greenhouse gas management)**

In 2019, **the Environmental Protection Administration approved Phase I (2018-2020) implementation plan of greenhouse gas management**

In 2021, **signed the Declaration for Climate Emergency**

Tainan City Self-Government Ordinance for a Low-carbon City

To build a healthy, happy and prosperous low-carbon city that is on a par with international standards for Tainan' s citizens, the City Government drafted the "Tainan City Self-Government Ordinance for a Low-carbon City" in June 2011, which was subsequently passed after three readings in Tainan City Council, approved by the Executive Yuan, and promulgated its implementation based on the Order Fu-Fa-Gui-Zi No. 1011084760A on Dec. 22, 2012, making Tainan City the first special municipality in Taiwan to adopt the low-carbon city as its governance standard. After years of rolling review and adjustments, the "Tainan City Self-Government Ordinance for a Low-carbon City" now consists of 6 chapters and 38 articles and is jointly promoted by the City' s 14 departments and bureaus.

This Self-Government Ordinance
Chapter 6, Article 38

↓

Subsequent review in 2017
Amended as Chapter 6, Article 37

↓

Reviewed in 2019
Amended as Chapter 6, Article 38

↓

Reviewed in 2020
Amended as Chapter 6, Article 38

Chapter 1 General principles (1~3)
Chapter 2 Practical application of low-carbon education (4~10)
Chapter 3 Promotion and management of low-carbon city (11~15)
Chapter 4 Promotion and management of low-carbon city (16~34)
Chapter 5 Penalties (34-1~37-1)
Chapter 6 Supplementary provisions (38)

Low-carbon Adaptation and Sustainable Development Committee

In addition to the regulatory works executed by government departments on greenhouse gas reduction, suggestions and advice will be sought from various parties. According to Paragraph 2 of Article 3 in the "Tainan City Self-Government Ordinance for a Low-carbon City", Tainan City Government would establish a Low-carbon Adaptation and Sustainable Development Committee to promote and carry out the relevant low-carbon actions. The Tainan City Low-carbon Adaptation and Sustainable Development Committee will hold meetings irregularly at least once a year. The Mayor will be the convener and the members include scholars, experts, environmental protection organizations, non-profit organizations, government agencies, low-carbon industries, and City Government representatives. The Committee will review the formulation of various low-carbon strategies on a rolling basis, and also evaluate the implementation status of various low-carbon tasks.

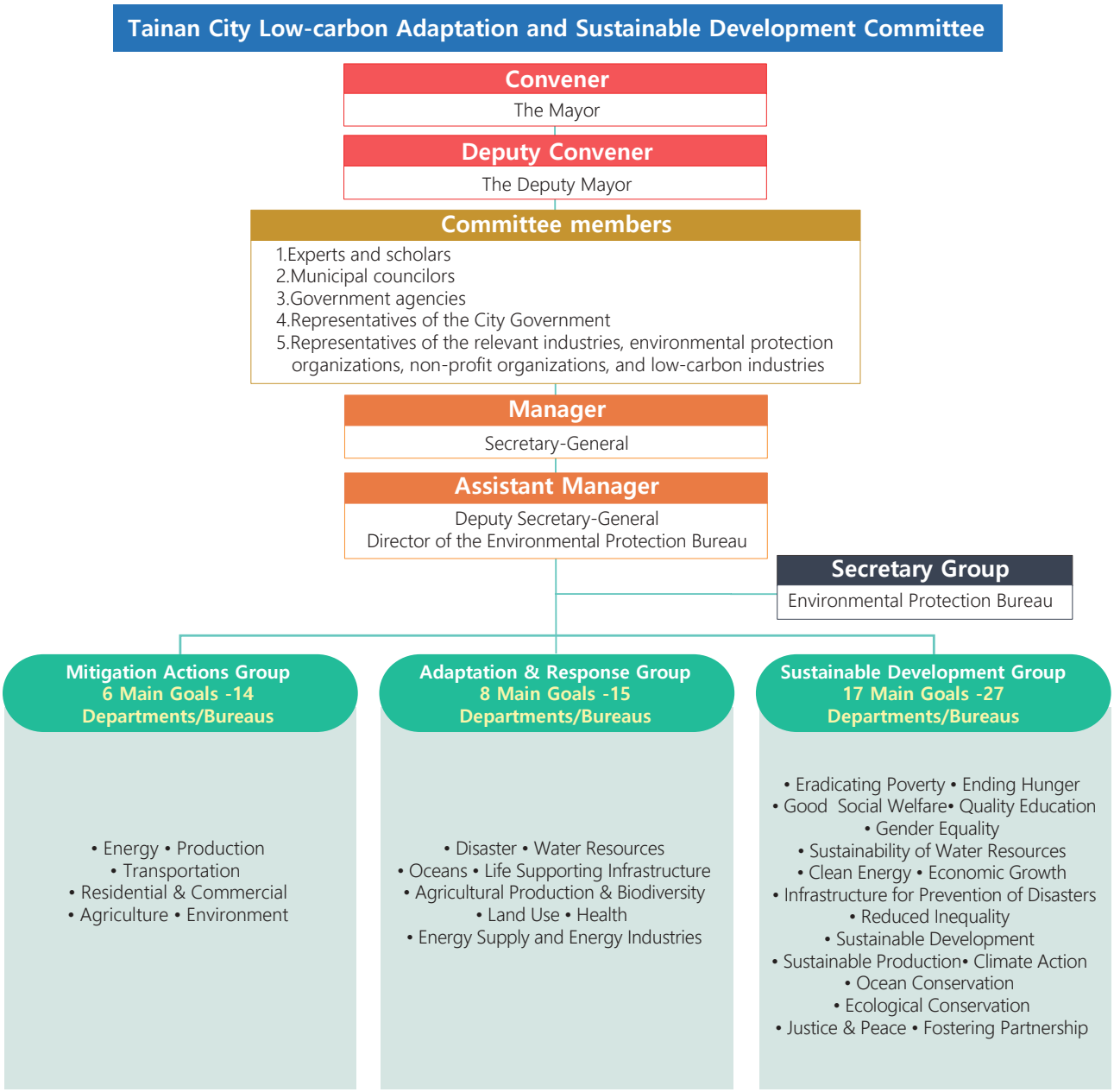


Diagram: The organization structure of the Tainan City Low-carbon Adaptation and Sustainable Development Committee

Phase 1 Framework of the implementation plan for greenhouse gas control

Tainan City promoted Phase 1 of the "Tainan City Greenhouse Gas Control Implementation Plan" in 2018, integrating 14 departments and bureaus related to greenhouse gas reduction, including the Environmental Protection Bureau and the Public Health Bureau, to carry out comprehensive control through cross-department/bureaus horizontal cooperation. Phase 1 consists of 6 main goals, 20 promotion strategies, 30 key performance indicators and 125 promotion methods.

6 Main Goals, 20 Promotion Strategies, 30 key indicators & 125 Methods

Framework of the implementation plan for Tainan's greenhouse gas control

Environmental Aspect	Resources Recycling	**Environmental Protection Bureau** Clear and Bright Sky, Quality Living in the Homeland of Tainan - 4 items Low-carbon Education - 7 items Regional Investigation for Global Connection - 4 items Wastewater Treatment and Reuse - 2 items Energy and Resources Recycling and Reuse - 16 items
Agricultural Aspect	Friendly Agriculture	**Agriculture Bureau** Friendly Environment for Green Animal Husbandry - 12 items Ecological Greenery and Environmental Conservation - 12 items
Residential & Commercial Aspect	Residential & Commercial Energy-Saving	**Public Works Bureau** Improvement of Building Energy Efficiency - 4 items Establishment of Low-carbon Urban Living Hub - 5 items Residential and Commercial Energy Conservation Action Plan - 12 items
Transportation Aspect	Green Transportation	**Public Works Bureau** Low-carbon Tourism Promotion - 4 items Elimination of Old Vehicles - 3 items Smart Green Transportation - 8 items Improvement in Public Transportation - 5 items
Manufacturing Aspect	Energy Transformation	**Economic Development Bureau** Industrial Energy Transformation - 9 items Energy User Management - 2 items Carbon Investigation & Disclosure - 3 items
Energy Aspect	Solar City	**Economic Development Bureau** Green Energy Technology Development - 5 items Solar City - 3 items Energy Usage Management - 5 items

Diagram: Framework of the implementation plan for Tainan' s greenhouse gas control

Results of Greenhouse Gas Reduction

To examine the detailed results of greenhouse gas reduction and assume the responsibility of global citizenship in carbon disclosure, Tainan City investigates the total amount of greenhouse gas emissions within its jurisdiction every year. In the recent two years, Tainan actively participated in the Caron Disclosure Project (CDP) and was rated "A" in the assessment for two consecutive years (2019 and 2020), which accounted for only 13.25% of the world' s participants.

According to the results of the investigation, the City's greenhouse gas emissions have been decreasing since 2010. The total greenhouse gas emissions in 2019 were 21.04 million tons of CO2e, which was reduced by 5.83 million tons compared with 26.87 million tons of CO2e emissions in 2010. It was a substantial improvement rate of 21% reduction.

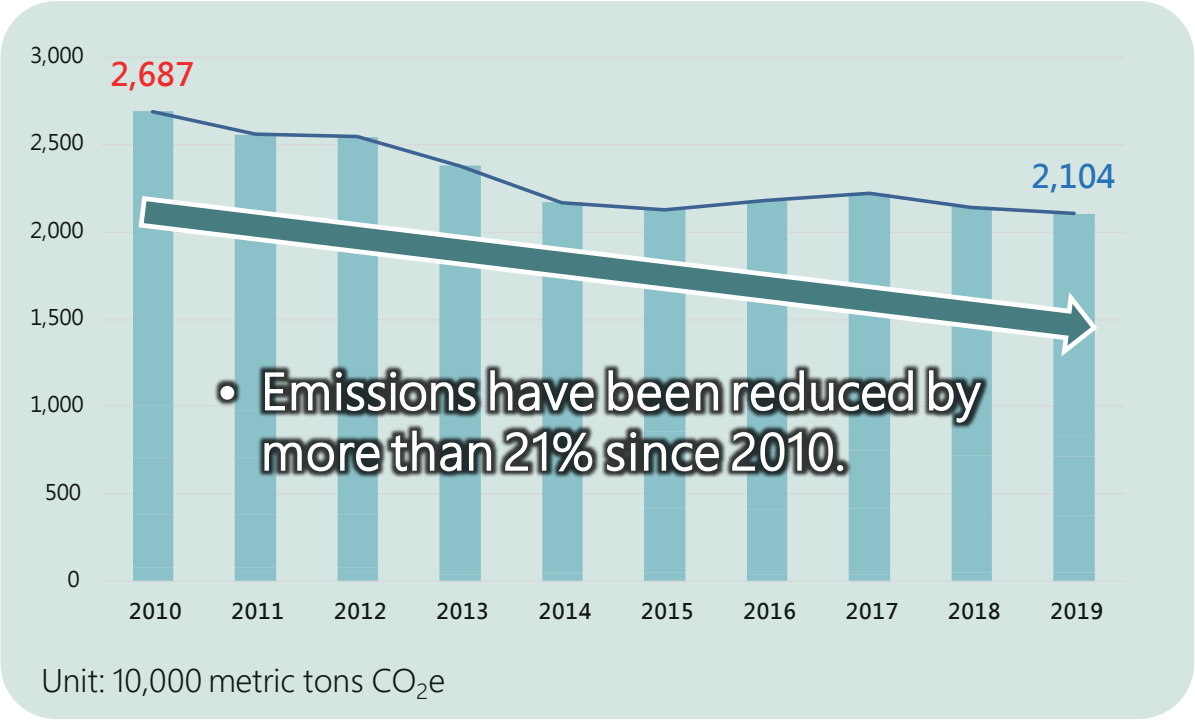


Diagram: Changes in Tainan City' s Greenhouse Gas Emissions over the years

2050 vision of net zero carbon emissions

The impact of climate change is imminent. In order to prevent the intensification of climate change, the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change proposed the "Paris Agreement", which strives for temperature control in this century to be within 2°C compared with the pre-industrial age. In 2019, the EU proposed achieving the goal of carbon neutrality by 2050. This proposal prompted a snowball effect on the global discussion of net zero carbon emissions. In 2021, 13 countries formulated relevant regulations, 3 countries were in legislation process and 129 countries in the stage of policy research or target discussions.

With the international emphasis on energy conservation and carbon reduction, the Environmental Protection Administration announced a draft amendment to the "Greenhouse Gas Reduction and Management Act" in late October, 2021, and renamed the bill the "Climate Change Adaptation Law". The main amendments were in Paragraph 1 of Article 4, which formally set the long-term reduction target of Taiwan's greenhouse gases at net-zero greenhouse gas emissions by 2050. In response to the central government's 2050 net-zero greenhouse gas emissions target, Tainan City began formulating relevant strategies and goals since 2021. In order to progressively reduce greenhouse gas emissions, the City Government will promote Phase 2 of the "Tainan City Greenhouse Gas Control Implementation Plan". Through eliminating projects with no substantial carbon reduction benefits, streamlining and combining similar indicators, etc., the City Government has drafted the contents and goals of Phase 2 of the implementation plan, which will be jointly handled by 14 relevant bureaus and departments. The plan consists of 6 main goals, 19 promotion strategies and 111 promotion methods, and the 3 key commitments from the City's Climate Emergency Declaration will serve as the primary goals:

1. Renewable energy installation reaching 4.5GW by 2030
2. Buses to go fully electric by 2030
3. By 2030, greenhouse gas reduced by more than 40% compared with the emissions of 2010

Promotion of low-carbon transportation

Background

Tainan City took the opportunity of the merger of county and city to review and improve all the bus routes. Since 2012, the City Government has actively conceived a plan to promote the reformative "MRT-based public transport system". With "MRT-based bus transport" as the core strategy, a blueprint was drawn up for the development of public transport in Tainan, which divides the City's buses into main lines, branch lines, and city buses. In addition to reorganizing mass transportation, Tainan has also committed to the development of low-carbon transportation vehicles and smart transportation projects, in the hope of creating a low-carbon, green transportation environment through comprehensive planning.

Electrification of city buses

In consideration of an aging population in Tainan, citizens' reliance on public transportation will be increasing. The City's main goal is to make the buses barrier-free for all. In addition, private vehicles, buses, and other means of transportation have been the main causes of air pollution. In order to improve the City's air quality and align with the Executive Yuan's policy target for the full electrification of public transport buses by 2030, the Transportation Bureau has been making plans for city buses and the vehicles running main lines. Since 2020, bus operators were required to phase out the old buses and replace them with new electric buses. The newly purchased electric, barrier-free buses will be introduced at a rate of 30 buses per year. It is estimated that 400 buses in Tainan will complete the target of full electrification and barrier-free green transportation by 2030.

Shared modes of transport in the “last mile” transit of public transportation

In order to encourage the public to use zero energy, pollution-free bicycles as short-distance transit mode and promote the public to ride bicycles for daily commuting, leisure and exercise, Tainan City’ s Transportation Bureau has been promoting the "Tainan City Public Bicycle Rental System" since 2016, to offer the “last mile” service for citizens using public transportation. At the same time, private enterprises have been invited to provide support in terms of donations of bicycle rental stations and bicycles. In 2017, Tainan City was awarded the "Healthy City - Health Specialty Award" by the National Health Administration of the Ministry of Health and Welfare. As of 2020, the Chia Nan University of Pharmacy and Science, Taiwan Semiconductor Manufacturing Company, Kun Shan University, Chi Mei Optoelectronics, and National Chiao Tung University have each donated one T-Bike rental station, and in 2020, rental stations have landed in Xibei region (Xinying District) for the first time. There are now 77 stations and 2,104 bicycles available. Since inception in late 2020, the cumulative usage has exceeded 3.06 million person-times.

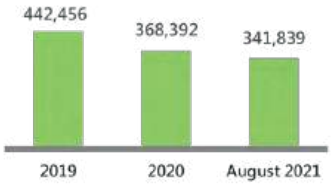
In addition to public bicycles, the City’ s first shared motorcycle operator entered into business in 2019, adding 500 shared electric motorcycles into service. In 2020, 2 more operators went into business by further offering 700 shared electric motorcycles, providing additional choices to consumers for daily commuting and local sightseeing. These help to reduce the need for ownership of private vehicles and thereby minimize pollutant emissions. The shared vehicle operators are actively evaluating the placement of more shared vehicles, and the City Government will also actively provide them with guidance and assistance.

Smart Green Transportation - Establishment of Smart Parking Management

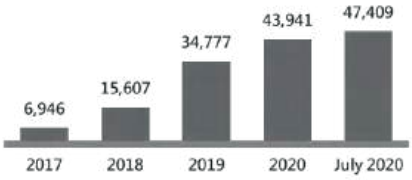
Besides green transportation, the City's parking facilities have been under smart development since 2016. Smart billing posts and smart geomagnetic detection devices have been installed, allowing the public to obtain real-time parking information through APP, the internet, etc. The smart billing posts use electronic tickets for payment, or APP for third-party payment, saving manual issuance of invoices and manual payment, and thus improving the efficiency and convenience of parking payments. By 2020, there were as many as 8,400 smart parking posts/spaces, including 2,000 smart parking posts and 6,400 parking spaces with smart geomagnetic detection, accounting for 66.65% of the City's 12,604 paid parking spaces. The intelligentization achievements won "Cloud Computing and IoT

Innovation Awards" in 2019, "Smart City Innovative Application Award" and "Gold Thumb Award for Private Participation in Infrastructure Projects" in 2020, showing the wide recognition of the City' s efforts.

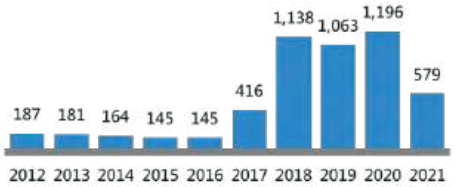
Elimination of 100,000 old vehicles
in the past 2 years
Ranked first among 6 special municipalities
in elimination of old vehicles



An increase of 40,000 electric motorcycles
in the past 5 years
Ranked first among 6 special municipalities
in the growth rate of electric motorcycles



Elimination of near 4000 vehicles
Phase 1 - 3 Large Diesel Vehicles



Speeding up the replacement of high-pollution vehicles

In order to continue eliminating high-pollution old motorcycles, the Environmental Protection Administration (EPA) has continuously provided relevant subsidies to encourage motorcycle owners to replace their two-stroke motorcycles in recent years. In addition to cooperating with the EPA's policies, Tainan City was the first city in Taiwan to promote a three-year, three-stage subsidy policy since 2016, providing additional subsidies and stricter control measures to speed up the replacement of two-stroke motorcycles. So far, 120,000 two-stroke motorcycles have been eliminated within five years. In addition to the two-stroke motorcycles, Phase 1 - 3 large diesel vehicles are also being replaced. As of now, more than 4,000 such vehicles have already been replaced.

The EPA has provided subsidies for the replacement of Phases 1-4 old motorcycles with low-pollution vehicles since 2020. In addition to cooperating with the EPA' s policies, Tainan City has also provided additional subsidies for newly purchased electric two-wheelers and offered more preferential subsidies for low- and middle-income households and those living in remote areas, including Nanhua District, Longci District, Zuozhen District and Nanxi District. By the end of 2020, 43,941 electric motorcycles have been registered in the City, which increased by 41,000 electric motorcycles since 2016, with the growth rate ranking first among the 6 special municipalities.

Advocating Clear and Bright Sky

Background

Since 2014, Tainan City has pioneered in the nation through pooled efforts of various departments and bureaus to promote the "Clear and Bright Sky - Particulate Matter Reduction Control" plan to reduce particulate matter in the air, with annual rolling reviews to ensure strict control over the sources of air pollution. To further refine the City's air pollution control, Tainan City Government re-examined and formulated relevant strategies in 2019, with the launch of the "Clear and Bright Sky PLUS" plan, which came up with 49 control strategies in eight major areas after rolling refinement. The City’ s relevant departments and bureaus are expected to work together continuously and pragmatically promoting various control measures to improve the City's air quality, and achieve the vision of "clean air, healthy environment, low-carbon and sustainable living” .

Tainan’s Air Pollution Challenges

1. Affected by terrain and climate, Taiwan’s air quality deteriorates, with an increasing trend from the north to the south.

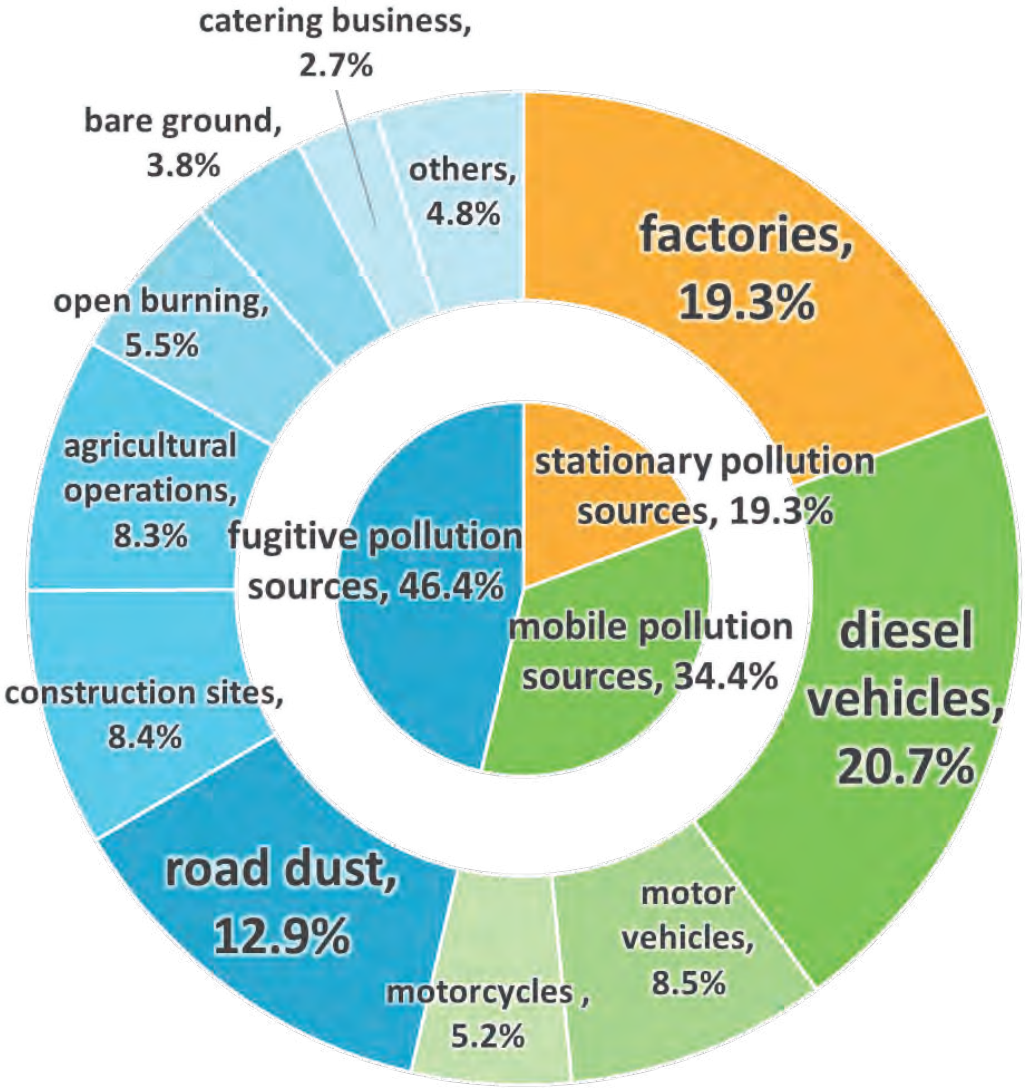
Weather patterns are closely associated with regional air pollution. It has been obvious that pollutants are being blown from the north to the south. In addition, global warming has led to climate anomalies in recent years. According to the scientific analysis, the continental cold high-pressure systems in East Asia in the past 40 years has been weakening, which causes a decrease in the annual number of windless days in Taiwan, making it harder for pollutants to disperse and easier for them to accumulate in the upper air layer. Moreover, southern Taiwan is blocked by the Central Mountain Range, and the Chiayi-Tainan Plain is located on the leeward side of the Range, making it even easier for pollutants to stay and accumulate, so that this region has poorer air quality than other regions in the fall and winter.

2. 76% of pollution comes from the windward counties/cities and overseas

Since the northeast monsoon prevails in Tainan for about 7 months every year from October to April of the next year, pollutants are obviously being blown over from overseas or from windward areas in the southward direction. Based on the simulation of the EPA, 44% of the City’ s pollution comes from large power plants and industries of windward counties and cities, and about 32% from overseas sandstorms, smog, etc.

3. The City's air pollution comes from extensive sources

About 24% of the City's air pollution comes from the City's own pollution. According to the Taiwan Emission Data System (TEDS Version 10.0), the major sources of the City' s estimated emissions of fine particulate matters (PM2.5) are factories (19.3%), diesel vehicles (20.7%), motor vehicles and motorcycles (13.7%), road dust (12.9%), construction sites and bare ground (12.2%), agricultural operations (8.3%), and open burning (5.5%), respectively. The proportions of various sources of PM2.5 emissions are as shown in the diagram below.



Regulatory aspects and strategies

1. Stationary pollution sources

The main core of the policy includes source control, implementation of laws and regulations, and pollution reduction, which consists of 11 measures in total. In addition to requiring the leading ten businesses in terms of air pollution emissions, including steel, textile, electricity, surface coating, etc., to reduce pollution emissions, the City Government negotiated with a total of 49 factories which made up the 20 leading pollution sources to reach a consensus on emission reduction as part of their corporate social responsibilities by adding control equipment to factories, improving control efficiency and replacing fuel to reduce air pollution emissions. The four-year plan aims to reduce 32 metric tons of PM2.5 particulate matters, 122 metric tons of nitrogen oxides, 161 metric tons of sulfur oxides, and 758 metric tons of volatile organic compounds by 2023. A total of NT$910 million has been invested in improving equipment efficiency and manufacturing processes in order to reduce the City's own air pollution sources. Secondly, a VOCs reduction task force was also established to conduct in-depth inspection of industries that emit volatile organic compounds, such as surface coating and gravure printing, and invited experts and scholars to advise on reducing the emissions of volatile organic compounds. Thirdly, for businesses with an annual NOx emissions of more than 40 metric tons, improvement of processes or the addition of control equipment are required to be completed by 2025.

2. Mobile pollution sources

There are 19 measures in total, which include the replacement of old motorcycles, improvement in diesel car emissions, promotion of low-pollution vehicles and clean fuels, and control of vehicles in use. Increased subsidies to the public for replacement of old motorcycles, which plans to eliminate more than 192,000 old motorcycles and at least 6,000 old diesel vehicles, and to motivate 317 large fleets of vehicles within the City’ s jurisdiction to obtain the emission self-management label within 4 years. The plan includes setting up an air quality maintenance area which prohibits entry of polluting vehicles.

3. Fugitive pollution sources

A total of 15 measures, including the control of construction projects, control of dust from bare ground and roads, and tackling pollution that affects livelihood issues. Unmanned aerial vehicles have been used to detect open burning and dust on construction sites during seasons with poor air quality. Scientific instruments and other inspection mechanisms are used to help identify and enforce a compliance rate of over 90% for large municipal public works with fugitive pollution and ensure the coverage of bare lands using self-produced straw mats for at least 80 hectares. In fall and winter, to increase the capacity of street washing by 50% and the yearly coverage rate of street washing (from 70% to 85%), and to advocate environmentally friendly and low-fume manufacturing through certification.

4. Comprehensive management

There are 4 measures in total, including the implementation of the Clear and Bright Sky project, advocacy and prevention of poor air quality, environmental education action plan on air quality, and promotion of green living. Conduct rolling review of the Clear and Bright Sky project through various air quality

control-related meetings, and also promote the air quality and environmental education action plan to enhance the public's environmental protection knowledge, skills, attitudes, and values. Real-time broadcast on air quality through diversified publicity channels including: the social media, large intersection TV walls and AQI broadcast information stations. Additionally, the City has four national air quality monitoring stations set up by the EPA. In 2016, the City Government cooperated with non-governmental organizations and the Academia Sinica to build 240 air quality monitoring boxes in the City' s elementary schools and parks, with online inquiry available to the public. In addition to campuses, the Environmental Protection Bureau has also installed 1,400 micro-sensors in the City' s 21 industrial zones to monitor pollution conditions, which ranks first in the nation in terms of the number. The City' s green area will also be increased to help adjust the regional microclimate.

Emergency response of air pollution to ensure the safety of school children

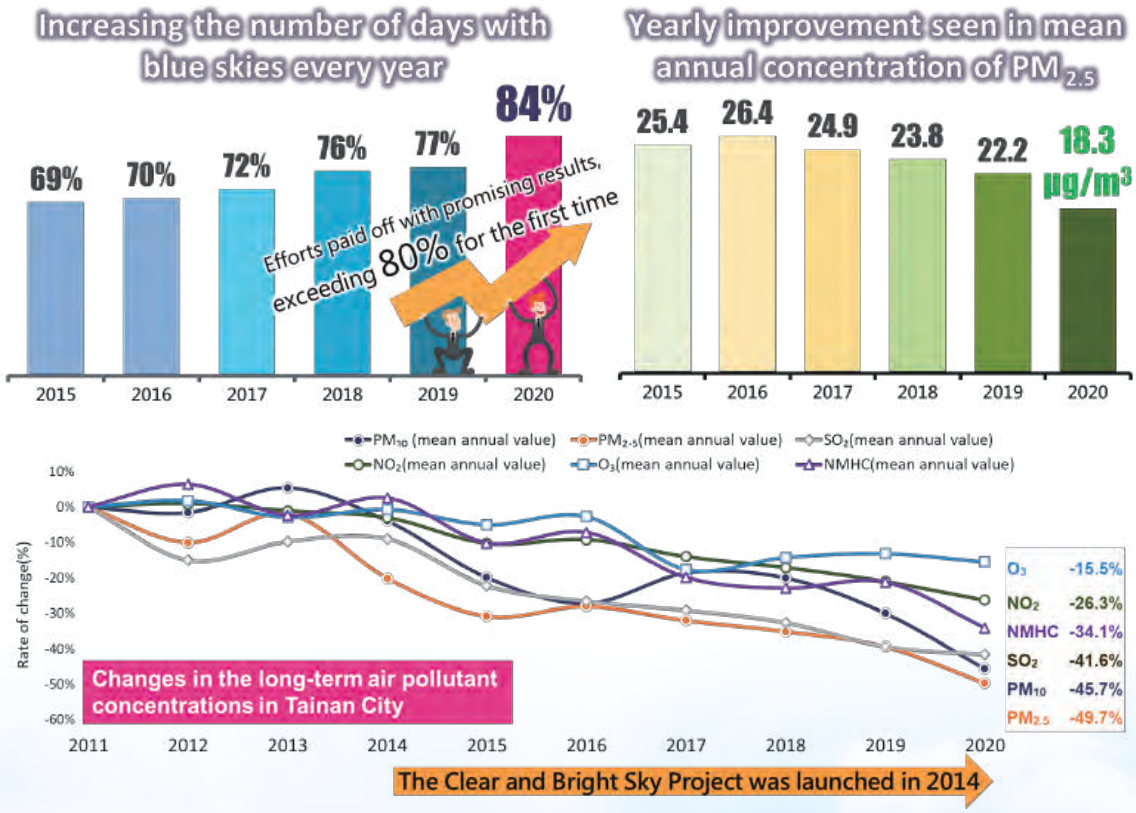
Once the Environmental Protection Bureau (EPB) predicts poor air quality ahead, the City' s departments/bureaus should make advance arrangements for the emergency response operations of poor air quality. In case of an orange alert, the EPB emergency response team will be activated; in case of a red alert, the cross-department/bureau emergency response team will be activated. The EPB will intensify its inspection and testing in the fall and winter by increasing the frequency and number of factory inspections, requiring all emission sources to implement the operation of control equipment and operate with permits accordingly, so as to effectively curb the illegal discharge of pollutants. In school campuses, the Education Bureau will also initiate the relevant corresponding actions, such as watering of bare grounds, based on the pollutants found.

Improvement of air quality for the return of blue skies

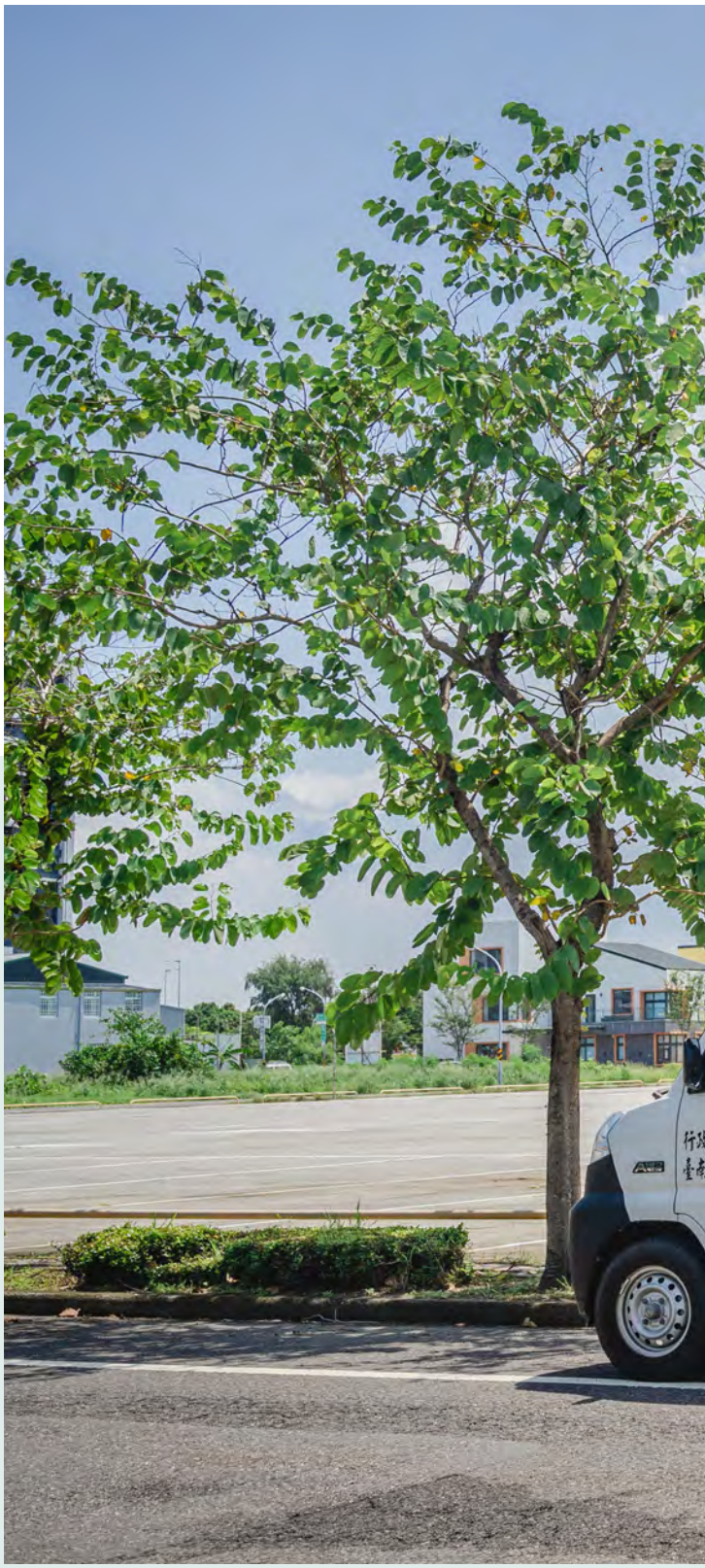
Tainan City Government promotes the Clear and Bright Sky Project to implement air pollution control and management. According to the latest research findings by the Environmental Protection Administration, the City' s sources of air pollution have decreased from 33% to 24%. The poor air quality rate in 2020 was 15.6%, which was a 49% improvement with 30.6% in 2015. The mean annual concentration of PM2.5 was 18.3μg/m³ in 2020, which was a 28% improvement compared with 25.4μg/m³ in 2015. The number of days with blue sky has also increased from 69% in 2015 to 84% in 2020. These results show that the implementations have been effective. To continue to refine pollution management and control actions, the City Government' s highest levels will host a rolling review meeting of the Clear and Bright Sky Project or air pollution control every two months.

Vision for the future

Tainan City launched the "Clear and Bright Sky Project" in 2014, integrating 18 departments/bureaus related to air pollution improvement, including the Environmental Protection Bureau and the Public Health Bureau, to attain collective control and synergistic effects. Phase 1 (from 2015 to 2019) aimed to reduce the number of days when PM2.5 exceeded the red alert (PM2.5≧54μg/m³) by 50% within 5 years, while the actual result reached 76%. After the goal of Phase 1 was reached, the "Clear and Bright Sky PLUS" project was proposed to implement control of pollution sources and reduce pollution emissions. The goal is to increase the number of days with blue sky by 0.5% every year, and the hourly ozone value reaching 92.5ppb and the mean annual PM2.5 value reaching 15μg/ m³ by 2027.


Increasing the number of days with blue skies every year
69%
70%
72%
76%
77%
84%
Efforts paid off with promising results, exceeding 80% for the first time
2015
2016
2017
2018
2019
2020
Yearly improvement seen in mean annual concentration of PM2.5
25.4
26.4
24.9
23.8
22.2
18.3 μg/m3
2015
2016
2017
2018
2019
2020
PM10 (mean annual value)
PM2.5(mean annual value)
SO2(mean annual value)
NO2(mean annual value)
O3(mean annual value)
NMHC(mean annual value)
Rate of change(%)
10%
0%
-10%
-20%
-30%
-40%
-50%
-60%
O3 -15.5%
NO2 -26.3%
NMHC -34.1%
SO2 -41.6%
PM10 -45.7%
PM2.5 -49.7%
Changes in the long-term air pollutant concentrations in Tainan City
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
The Clear and Bright Sky Project was launched in 2014

Prevention actions of COVID-19 pandemic



In the face of the severe impact of the COVID-19 pandemic, to prevent the community from infection and maintain the health of citizens, Tainan City Government has actively strengthened administrative operations, carried out community and medical pandemic prevention and preparation of resources for pandemic prevention, in the hope of making advance arrangements and responding to the ever-changing pandemic.

(I) In terms of administrative operations:

1. The City Government set up a COVID-19 response team and invited experts and scholars to form an advisory group. Meetings are being held every morning, focusing on the development and advance prevention measures of the pandemic, which cover all aspects ranging from food, clothing, housing to transportation.
2. Various units conducted COVID-19 ICS (Incident Command System) operations in groups and held regular meetings according to the task groups. The first-level command center was established, and the Mayor served as the convener to discuss the division of work across departments and bureaus.
3. The City' s various departments/bureaus established emergency response teams. To respond to a large number of public opinions and eliminate all kinds of false information, special personnel have been assigned to take charge of social media and website updates, providing the public with the latest and most accurate information on pandemic prevention policies.

Disinfection trucks performed cleaning operations

The Mayor inspected the vaccination station

(II) Pandemic prevention in the community and medical services

1. Maintain medical care capacity

Tainan City pioneered in the establishment of an OLOCC (On-Line Operations Coordination Center), which was an extension of the concept of an On-Site Operations Coordination Center (OSOCC) in the United Nations disaster relief system. Hospitals reported through live video update on admission status as summarized from the health insurance card swiping data, and relevant important policies were being announced to the hospitals. Through such real-time online coordination and centralized command center, the immediate inventory of wards and manpower could also be accurately obtained for further arrangements.

Patients received triage and were sorted according to their conditions. Asymptomatic patients were diverted to centralized quarantine stations, patients with mild to moderate symptoms were received by the regional hospitals, and patients with severe conditions were admitted into the intensive care unit of regional hospitals or transferred to medical centers. Patients were being treated with appropriate medical resources to reduce the pressure of medical teams.

2. Reducing community-wide infection:

The top priority was to "strengthen community defenses" and "eliminate the sources of infection as soon as possible". Hospitals have set up community screening stations, and the City's public health centers have set up expanded screening stations. In response to the expansion of sampling and inspection in the community, the City designed Taiwan’ s first mobile container sampling and inspection station, which has improved the safety of the inspection personnel and helped reduce the consumption of protective equipment, thus increasing the efficiency of sampling and inspection. In addition, for large workplaces in science parks, screening stations are set up on-site according to the actual demand so that cases can be detected immediately for follow-up processing. In addition, in order to achieve herd immunity and increase the vaccination rate, publicity has been carried out on various occasions, and vaccination stations have been widely set up to offer convenience and raise the public’ s willingness to get vaccinated, some of which had accommodated specific local conditions in the set-up, as seen in locations such as the Tainan Art Museum, Chimei Museum and docks.

Special Vaccination Station - Hsu Shih Music Library

(III) Recovery of economic activity and relief assistance:

1. Tainan City is an ancient capital with rich culture and history. An online guide platform has been established based on cloud technology to overcome the limitations of physical sightseeing, enabling visitors to travel in greater Tainan when they are unable to visit in person.
2. Tainan is also a city famous for its delicious food. To ensure a balance in epidemic prevention and economic activities, the number of diners in restaurants has been limited, social distance has been maintained using partitions, giving peace of mind for the citizens while enjoying good food.
3. An integrated platform for e-commerce has been set up for Tainan City, selling all kinds of products, such as local food, vegetables, agricultural specialty fruits, etc., for consumers and to stimulate economic development.
4. In terms of relief subsidies, a one-stop service window has been set up to handle the relief programs of the Central or the City Government, so that people can maintain as much a normal life during the pandemic as usual and the economy can be revived.

III.

Promotion history and development blueprint

攝影：翁宗憲

Tainan's sustainable development history and goals

We are facing the challenge of climate change. By 2050, Taiwan will have a new coastline due to rising sea levels. Anping, the origin of Taiwan's modern history, is facing the risk of being submerged by sea water. If we do not take environmental issues such as climate change seriously, the consequences could be dire. Tainan City has comprehensively planned for the City's carbon reduction policy and demonstrated its efforts in combating the global climate crisis. The history of Tainan City's sustainable development is shown as follows.

• Spearheaded the demonstration with low-carbon self-government ordinance:

Tainan was Taiwan' s first city to incorporate low-carbon city governance into law. In 2012, Tainan City became a low-carbon demonstration city in southern Taiwan; the year marked the City' s first year in the low-carbon era. In December 22, 2012, Tainan promulgated the implementation of "Tainan City Self-Government Ordinance for a Low-carbon City", and the Mayor acted as the convener in setting up the "Low-carbon Adaptation and Sustainable Development Committee", integrating 14 departments and bureaus with dedicated organization and promotion to implement the goals and management of the low-carbon city, regulate the mandatory installation of photovoltaics for 800 kw heavy consumers of electricity, and designate particular areas as low-carbon demonstration communities. Carbon emissions have continued to decrease every year with up to 20% reduction compared with the emissions in 2010.

• Joined the Global Covenant of Mayors for Climate & Energy to obtain the highest-level badge:

Tainan showed its determination to build a low-carbon city by joining the Global Covenant of Mayors for Climate & Energy, the world's largest climate change organization, in 2015. In July of the same year, a commitment had been made to complete various audits, and in October, 4 badges of the highest level in the Covenant were obtained, officially making Tainan a member of the Covenant.

• Obtained the International Cities ISO 37120 Platinum certification:

Tainan joined the World Council on City Data (WCCD) in 2017 and began taking part in ISO 37120 certification. With the cooperation of various departments/bureaus, 100 index projects were completed in two consecutive years, with comprehensive achievements in social, economic and environment aspects, and was awarded the highest level of WCCD platinum certification in both 2018 and 2019.

• The Solar City Project has won the APEC "Low-carbon Demonstration City" Gold Award:

In 2017, Tainan City Government participated in the 3rd APEC Energy Smart Community Best Case Selection Competition with the "Solar City - Tainan Embraces Sunshine" project and won the "Gold Award" (the highest honor) in the "Low-carbon Demonstration City" category, making Tainan the first local government in Taiwan to receive such an honor, successfully beating countries such as China, South Korea and Russia, enabling the soft power of Taiwan's green energy technology to enter the international arena. Moreover, the City's green energy construction achievements have also won the "2020 Smart City Outstanding Contribution Award", which was the only city/county in southern Taiwan to win such an award.

• Listed as an A-level city by the CDP, an International Organization:

Cooperated with the Carbon Disclosure Project (CDP), an international organization, to publicly disclose the City's carbon emissions inventory, formulate future executable carbon emission reduction and renewable energy goals, and publish a city climate action plan. For two consecutive years (2019 and 2020), the City was rated "A", the highest leadership level, by the CDP, showing that its achievements in promoting low-carbon cities and sustainable development have been recognized internationally.

• "Tainan City Healthy City SDGs":

In response to the United Nation's sustainable development goals (SDGs), the Public Health Bureau proposes four categories of indicators: health, environment, society, and industrial economics under the "Tainan City Healthy City Sustainable Development Goal Indicator Quantitative Research Plan". Combined with the certified indicators of ISO37120, the "Tainan City Healthy City SDGs Indicators" are in line with international standards by using quantifiable indicators (e.g., green light: good results; red light: improvement required) to conduct annual rolling review under 17 goals, 4 categories, and 254 indicators (refer to Appendix 1 for details).

• Signing of the Climate Emergency Declaration Commitment to new goals on carbon reduction, electrification of buses and green energy by 2030:

Tainan City is actively working against the impact of extreme climate. On May 11, 2021, Mayor Huang Wei-che led the City Government team to sign the "Tainan City Climate Emergency Declaration" at Anping Fort, which was witnessed by Greenpeace. Proposal on the visions of sustainable development was made for 2030. The visions include a renewable energy capacity of 4.5GW (Giga Watts), carbon neutrality for electricity consumption in the residential and commercial sector, full electrification of city buses, and working gradually towards net-zero carbon emissions by 2050.

• Won the 2021 Yuan Ye Awards for Urban City Construction and the FIABCI-Taiwan Real Estate Excellence Awards:

Tainan City uses the concept of sponge city and the design of permeable pavements to create a human-centered and friendly environment; combining the concepts of water control, water purification and hydrophilicity, it also has both landscape and flood retention functions. In 2021, the excellent design garnered 16 awards in the Yuan Ye Awards and 34 awards in the FIABCI-Taiwan Real Estate Excellence Awards, which has set a precedent in all of Taiwan.

• Tainan Sustainability Voluntary Review and Evaluation Report:

Tainan’ s SDGs adopted "3 Improvements, 3 Sustainabilities" as the principles of its administrative policy, which consist of economic growth, transportation improvement, health improvement, sustainable environment, sustainable care, sustainable culture, and education.

Combined with the City's 2021 administrative plan, the policies in greenhouse gas control, climate change adaptation, healthy city indicators and climate emergency declaration are in line with the United Nations’ SDGs framework. Based on 17 SDGs and in consideration of the City's development status, 10 items will be prioritized in the 2021 inventory. The voluntary Local Review (VLR) of Tainan City's Sustainable Development Goals will be presented to regularly review the implementation progress of the 2030 Sustainable Development Goals. These include the United Nations’ 10 SDGs: Good Health and Well-Being (SDG 3), Quality Education (SDG 4), Clean Water and Sanitation (SDG 6), Affordable and Clean Energy (SDG 7), Decent Work and Economic Growth (SDG 8) Industry, Innovation and Infrastructure (SDG 9), Sustainable Cities and Communities (SDG 11), Responsible Consumption and Production (SDG 12), Climate Action (SDG 13), and Partnership for the Goals (SDG 17) and 55 sustainable sub-targets (refer to Appendix 2 for more details).

Tainan's sustainable development history and goals

Tainan City adheres to its sustainable development goals of "ample food and clothing; safe living and happy employment", and takes the "3 Improvements, 3 Sustainabilities" as the administrative strategy.

The "3 Improvements" include economic growth, transportation improvement and health improvement; the "3 Sustainabilities" include sustainable environment, sustainable care, and sustainable culture, and education.

Economic growth

The development of industrial zones and the promotion of start-up industries are two important policies for Tainan's industrial development, which aims to achieve a circular economy, and establish a sustainable supply chain.

Transportation improvement

Green, smart, and safe means of public transportation will be incorporated into mass transportation to create a green and sustainable public transportation environment, in the hope that citizens will experience the convenience in daily commuting brought about by smart technology.

Health improvement

Implementing prevention and control measures for local infectious diseases and establishing a vaccination policy to fully protect the lifelong health of citizens.

Sustainable environment

In response to the chain reaction caused by climate change, Tainan City actively engages in controlling air pollution emissions, promoting photovoltaic installation, fostering an environment of clean soil and water, and building a sustainable, low-carbon homeland step by step.

Sustainable care

Improve the community disaster prevention and rescue system and strengthen the promotion of evacuation advocacy. On the other hand, encourage community improvement, promote a green and beautiful neighborhood environment, and establish a sustainable disaster prevention and response mechanism while making the sustainable development of the community full of local features.

Sustainable culture and education

Commitment to providing high-quality and fair learning opportunities for all age groups, ensuring the learning requirements of students with special needs are met, and protecting the rights and interests of everyone to participate in learning.

IV. Prioritized objectives and results

攝影：翁宗憲

SDG 03 Good Health and Well-being

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

As Taiwan is entering an aging society, 15-16% of Tainan City' s population is over 65 years of age. Tainan City commits itself to protecting the lifelong health of its citizens and builds a sound and friendly system of medical care service, in which the elderly over 65 can have pneumococcal vaccines free of charge. The City attaches great importance to the popularization and fairness pf medical care, advocates the concepts of exercise and health, and actively prevents illness, drugs, and accidents, so that citizens of all ages can maintain physical and mental health.

The City communicates with citizens on health education through multiple channels, provides the public with correct information on vaccinations, and establishes the public' s awareness of vaccine safety and understanding of the national vaccine policy. Measures such as publicity on health education, integration of medical institution resources, combination of cross-ministry/council resources, vaccine refrigeration equipment and alert systems are adopted to increase vaccination rates.

Picture source: Official website of the National Cheng Kung University Hospital

3.1 Reducing the number of dengue fever cases

Establishing preventive control

Tainan City has identified 5 key factors contributing to the propagation of vector mosquitoes, namely the changes in the ecology and distribution of vector mosquitoes caused by the global climate change, the accelerated transmission of diseases due to urbanization and increasing population density, inadequate epidemic prevention capacity, lack of public awareness in the fundamental self-management and knowledge of dengue fever prevention, and the epidemic hidden in the community because of the characteristics of vector mosquitoes and asymptomatic patients infected by dengue virus.

To improve the public's knowledge of epidemic prevention, strengthen the TOCC inquiry of medical personnel, and set up the NS1 rapid tests to gain time for advanced epidemic prevention, the vector mosquito monitoring system has been employed to identify high-risk areas. The power of the community is utilized to reduce the risk of the occurrence and spreading of dengue fever.

Hygiene education publicity and training

In the 37 administrative districts of Tainan City, 412 epidemic prevention volunteer teams were set up this year, with an average of 5.3 actions to assist in the inspection and removal of breeding sources and health education, and hygiene education publicity and training were carried out for different audiences (e.g., community epidemic prevention volunteers, foreign worker agents, schoolteachers, students, and construction workers). From 2021 till now, 24 education and training sessions have been held, with a total of 4,889 participant-times. In Tainan City, as of the end of August this year, 92 cases of dengue fever had been reported, with 0 confirmed local case and 1 confirmed imported case.

Prevention and treatment of dengue fever

Vaccination for the elderly

3.2 Increased vaccination of the elderly

Cooperating with the central government in the promotion of influenza (left arm) and pneumococcal (right arm) vaccines

The high-risk group of Streptococcus pneumoniae infection is most likely the elderly over 65 years of age. The most effective way to prevent the infection of Streptococcus pneumoniae is getting the pneumococcal vaccine. The City advocates the pneumococcal polysaccharide vaccine every year when promoting influenza vaccine. In line with the central government' s policy, the City encourages vaccination with the slogan "left influenza and right pneumonia", meaning that citizens can get the influenza vaccine on the left arm and pneumococcal vaccine on the right arm, in the hope of increasing the vaccination rate among the elderly.

Taking the pneumococcal polysaccharide vaccine

According to the Statistical Information Query System of Taiwan Centers for Disease Control (CDC), in Tainan City, 69 people suffered from invasive pneumococcal disease (IPD) in 2008. Since then, Tainan City has cooperated with the CDC to promote vaccination of 23-valent polysaccharide vaccine (PPV-23) among the elderly over 75 years of age. According to the statistics, 58 people in the City suffered from IPD in 2012, 48 in 2014, 39 in 2017, and 28 in 2018. Because of the annual vaccination, the infection rate of IPS has decreased yearly.

3.3 Routine vaccination for children

Establishing preventive control

Considering that the relatively underprivileged social and economic groups are subject to a higher risk of rotavirus infection, and in order to reduce the threat of infection to the City' s infants and young children, the City has used its own budget to purchase oral vaccines against rotavirus infection since 2018 and provided them free of charge to the infants and young children of low- to middle-income households. Through this policy, the vaccination rate and herd immunity can be effectively increased, and the health of young children can be actively protected, at the same time preventing the inequality of health.

Vaccination for children

Regardless of his or her family economic conditions, every child can have the equal protection of vaccines, and does not have to suffer from the disease. In addition, it can also lower social costs such as health insurance and medical expenses, and parental care for sick children, providing a better child-raising environment for Taiwan, where birth-rate is on the decline.

SDG 04 Quality Education

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Education is the important foundation of the country. Only with good education can the next generation be built into outstanding people. In order to improve the education of citizens, Tainan City attaches great importance to education at every stage from preschool to lifelong education of the elderly. In addition to complete childcare, the City provides diversified learning channels and strengthens children learning in remote areas to ensure that the rights of all to get education are fairly and justly protected.

4.1 Increase the proportion of resident volunteers

Create a city with warm and friendly volunteering culture

The promotion of the municipal administration relies on the dedication of volunteers. Various bureaus and departments are encouraged to make good use of volunteer manpower to facilitate the municipal development, rather than planning and promotion by the relevant authorities on their own. The goal is to achieve the shared vision of Tainan volunteers: "show our love and kindness for the well-being of Tainan" . Through the processes such as the development of diversified volunteers, integration and utilization of resources, innovative actions, enhancement of knowledge and capability, localized establishment and niche marketing, the City can build a network of volunteers in various fields such as social welfare, culture, education, and health, and encourage citizens to join in the effort to make Tainan a friendly and warm city with volunteer support.

Volunteer service

Cross-department/bureau cooperation to develop diversified volunteer services

Cross-bureau/department cooperation to match enterprises and the elderly (O~young) volunteer team, integrating the City's manpower for public services, and establishing connections among elderly volunteers, elderly caring volunteer teams, corporate volunteers, etc., in conjunction with the Economic Development Bureau to promote corporate volunteering, and matching enterprises and elderly volunteers.

Through the injection of corporate resources, the service capacity of the elderly volunteer team has been enhanced. By end of June 2021, there were 42 elderly (O~young) volunteer teams, composed of 1,356 members.

O~young volunteer team

Taiwan's first glove puppetry training videos

Using martial arts stories told in simple daily language, in combination with the problems encountered in an aging society, volunteers received basic trainings through glove puppetry, so that they could easily learn about volunteer services and enhance the knowledge and willingness of the elderly to participate in volunteer services. There are 3 episodes of public glove puppetry performances released to be used as the teaching materials for education and training of the City' s volunteers.

Basic glove puppetry training for volunteers

4.2 Preschool children's services organizations

Since 2020, Tainan City has added 76 classes of public kindergartens to admit 2,011 preschoolers, 145 quasi-public kindergartens to admit 19,351 preschoolers, and 25 affordable kindergartens to admit 2,307 preschoolers. Generally speaking, the availability of affordable, public kindergartens has reached over 70%. In terms of the overall service capacity for preschoolers, there were 58,867 children 2-5 years of age in Tainan City in 2021, and 62,986 approved public and private admissions in total, making the supply-demand ratio as high as 107.0%.

On the other hand, in response to the central government' s policy and the Ministry of Education's principle of having kindergartens in all elementary schools, Tainan City will continue to expand the provision of public kindergartens, planning to add 171 classes which will admit 4,019 preschoolers from 2022 to 2024. In addition, the addition of quasi-public kindergartens will help raise the overall service capacity of public kindergartens in a general sense, lessening the burden on parents, and improving the quality of preschool education and caring services.

Inaugural Ceremony of the Tainan Guiren Kindergarten

4.3 Participation in lifelong learning

Promoting diversified options in lifelong learning

In this era of declining birthrate and aging population, promoting lifelong learning has become an important way to enhance citizens' knowledge and virtues. In order to promote lifelong learning and create diversified learning opportunities for citizens, Tainan City Government has established multiple adult learning channels to provide citizens with a variety of learning opportunities. Through the promotion of learning activities, it aims to achieve the goal of enhancing overall public participation in lifelong learning.

Learning for senior citizens in all districts

The City has completed the goal of setting up elderly centers in all districts. In the future, the City will continue to promote the addition of learning bases and courses in each center to enhance the convenience of elderly learning. In addition, campus space and equipment resources are opener to become a field for community learning with fun. The City has 38 elderly centers in 37 administrative districts. It is the first in the nation to have services catering to senior citizens in every district. Through public-private cooperation, integration of school and community resources, a rich and diverse learning venue for the elderly can be provided, encouraging the elderly to engage in learning with fun, and creating more opportunities for the elderly to explore life possibilities.

The elderly playing board games

Strengthening the functions of the digital opportunity centers in remote areas

There are 11 Digital Opportunity Centers in the City that provide information courses for those living in remote areas. The designs of courses and activities are to facilitate the development of remote areas, while digital networks are used to publicize the lesser-known local features of the remote areas. In cooperation with forward-looking projects, the action plan of digital opportunity centers is promoted. The City also actively plans to offer more courses and provide tablet rental services to the community activity centers.

Elderly learning to use electronic tablets

Implementation of various learning services for new immigrants

The City organizes education classes, and provides basic education services for adults and new immigrants with the aim of reducing illiteracy; supports new immigrants attending education courses with temporary childcare services for their toddlers and children; provides life adaptation classes and devises courses with various key topics to assist new immigrants in life adaptation; and expands the consultation platforms for lifelong learning and development of new immigrants in the communities to provide them and their families with opportunities to participate in multicultural and family education-related learning activities.

4.4 Placement for students with disabilities

Balanced allocation of educational resources

Every junior or senior high school in the City is equipped with distributed resources classes and special education teachers to provide students of special needs with special education-related support services. For students with disabilities from remote areas, special education service support, including academic counseling funds and itinerant counseling by special education teachers, will be provided upon passing of a review.

Regularly checking and tracking students with special needs

Special education teachers of the itinerant counseling classes are arranged regularly to provide personalized teaching services to students with special needs in the special education classes and general classes of various schools and evaluate the suitability of students with disabilities to receive special education-related services.

Multi-placement model for high school and vocational school students with transfer counseling mechanism

Briefing sessions are held, or admission activities used to publicize the vision and features of various schools to provide the basis for students when deciding their placement, eliminate parents' misconceptions, and enable students with disabilities to obtain appropriate placement. In the event that students cannot fit in after entering school, appropriate mechanisms are devised to offer on-campus counseling and assist in re-placement and school transfer.

Mayor Huang Wei-che serves as a one-day special education volunteer

4.5 Venue and facilities for environmental education

Diversified exploration, development and field connection

According to the "Tainan City Environmental Education Action Plan", the City Government has proposed 8 strategic goals thereunder: "systems and funds", "professionals and manpower", "fields and resources", "needs and promotion", "cooperation and exchanges", "recognition and action", "honor and responsibility" and "assessment and sharing". Besides increasing opportunities for exchanges and empowerment in various fields, the quality of the City's environmental education fields needs to be improved, and guidance is given to sites within the jurisdiction to apply for certification of environmental education fields. Through continual counseling, certified fields are being enriched as learning venues for environmental education in the City.

According to statistics, there are a total of 17 venues certified as environmental education facilities throughout Taiwan, and all 17 such venues are located in Tainan City.

Environmental Education Facilities in Tainan City

Create environmental education needs with diversified promotion

Schools within the jurisdiction of the City are encouraged to include certified venues in their itineraries when conducting annual outdoor learning programs, enabling the City’ s students to increase access to these venues.

The "Tainan City Environmental Education Facility Study Program" is implemented to subsidize teachers and students at the City's schools up to senior high to conduct outdoor learning in the City's environmental education facilities. Through the program, it’ s hoped to assist these schools in promoting environmental education and advocate the City Government’ s sustainable development concepts of energy conservation and carbon reduction.

4.6 Certification for low-carbon campus

Tainan City has been cultivating in-depth, low-carbon sustainable education for a long time. It is hoped that teachers and students will develop a civic mindset for actions to create a sustainable environment, so that all citizens of the City can have green awareness of environmental sustainability and contribute to the realization of a sustainable and livable city. In 2015, the "Low-carbon Campus Certification Mark Program" was formulated to help schools move towards low-carbon campuses and realize the vision of a low-carbon city.

The certification is divided into five categories: energy-efficient campuses, water resources campuses, resources recycling campuses, sustainable green campuses, and low-carbon living education. Scholars and experts of environmental education who have long been concerned about environmental issues are invited to serve as members of the review panel to emphasize the credibility of the certification system. Schools that have actively promoted the construction of a low-carbon environment and a sustainability-oriented curriculum will be named the "Low-Carbon Demonstration Campus", the highest acclaim, if they have passed the marks of 5 categories within 4 years.

Since the promotion in 2015, 36 schools in the City have passed the marks of 5 categories and earned the highest honor of "Low-carbon Demonstration Campus"; in 2020, 5 schools earned the honor: Chiachung Elementary School, Simen Experimental Elementary School, Danei Junior High School, Shiaying Junior High School, and North District's Wunsian Junior High School.

"Low-carbon Demonstration Campus" Awarding Ceremony

4.7 Improvement for a barrier-free school environment

In order to facilitate the access and use of buildings by persons with disabilities, new or additional buildings are required to be equipped with barrier-free facilities. To achieve a barrier-free campus environment, the City' s schools are to submit applications every year according to the needs of persons with disabilities in the school. The Education Bureau will conduct preliminary reviews, and the National Hemei Experimental School will make the second reviews, followed by the final approval of subsidy by the K-12 Education Administration, Ministry of Education. The City has further added funds of NT$520,000, NT$177.85 million, NT$3,900,856, and NT$2,018,000 from 2017 to 2020 respectively. Moreover, the City plans to build 6 inclusive playgrounds in 2021 in the following 6 elementary schools: Dacheng, Daqiao, Xinjin, Xiejin, and East District' s Fuxing and Anqing, all of which have centralized resources classes. It is hoped that students with disabilities (especially those with physical disabilities) are able to use the children's playgrounds.

Installation of inclusive playgrounds in schools

SDG 06 Clean water and sanitation

Ensure availability and sustainable management of water and sanitation for all

Water can nourish all living things. For Taiwan, an island in the sea, water is the important lifeblood. It is an indispensable element for Taiwan's sustainable survival and development. Therefore, coexisting with water without destroying its original quality is an issue that Taiwanese must seriously cope with. As such, popularizing the concept of environmental education among citizens and cultivating the habit of "conserving water, saving water, and protecting water" are fundamental to the protection of water resources.

6.1 Sewage treatment rate

Sewer connection rate

In Tainan City, most of the buildings are multi-story single-family houses. Hence, there is only a small proportion of buildings with special sewage and sewage treatment facilities. Moreover, its residential density is the lowest of the six special municipalities. Consequently, public sewers and sewer network layout and household pipe connections in the City are relatively difficult tasks. Furthermore, Tainan City' s many old settlements have narrow and windy lanes and alleys, which increase the difficulty of household pipe connections.

Tainan City Government has accelerated the construction of public sewers to improve the overall quality of living space. As of the end of August 2021, the City's sewage treatment rate was 57.92%; a total of 495 kilometers of public sewer network had been laid out; the penetration rate of public sewers was 23.88%; and the cumulative number of households connected to public sewers was 168,959.

6.2 Water resources

Cherishing water sources with prudence

In Taiwan, we have limited land, a large population, and rivers that are both steep and rapid. Although Taiwan has abundant rainfall, the difference between the wet and dry seasons is distinct, and the holding capacity of the rivers is small. As a result, water resources cannot be effectively stored and utilized. Coupled with the City' s rapid industrial and commercial development, the demand for water has increased sharply. This has led to difficulties in the diversion of water sources during the dry season, and the problem of water shortages has become increasingly serious.

The City has strengthened the monitoring of water status, carefully allocated water and increased the promotion of water conservation. The strategy is "prudence", and specific measures include "save more water ", "find more water ", and "divert more water " to fully implement the water conservation policy.

Save more water

Water conservation technology counseling is promoted to assist major industrial water users in effectively improving their water resources utilization efficiency. Water and energy conservation seminars for enterprises, households, and communities are organized, and activities such as wastewater recycling and reuse or field visits of award-winning manufacturers in water conservation are held to encourage the public and various organizations to implement water conservation promotion and the reasonable and efficient use of water resources.

Find more water

Inventory of the 19 drought-resistant wells indicated a daily output of 30,000 metric tons of water. A total of 18 manufacturers matched to apply for drawing water for the use of industrial and business secondary use water. Tree Valley Park has a large-scale water filtration facility that can process 800 tons of secondary treatment effluent water to produce about 430 tons of water and has 26 wells for agricultural use. The six water recycling centers in Anping, Annan, Guantian, Rende, Huweiliao and Liuying provide 16,800 tons of water per day. In the DA-LI Development construction project in Guiren District and the Shuipingwen Park parking lot project in South District, the sand filter equipment (groundwater treatment for the projects) is expected to produce 300 tons of water per day, respectively, all of which can be a source of secondary use water for non-human contact domestic purpose.

Usage of secondary use water

Divert more water

After water supply to the car wash industry was suspended on April 26, 2021, emergency water trucks were dispatched to shops in need of reclaimed water for car washing. A total of 43 water deliveries were made, totaling 175 tons.

Emergency dispatch of water trucks

6.3 Water Environment Protection Volunteers

It’s everyone’s responsibility to protect the river

"From caring to action", the City has established a river neighborhood watch patrol mechanism to continue promoting public participation in water environment patrol, through which the public can voluntarily pay attention to the environment and then protect the environment. Public participation in river pollution patrols and water quality monitoring can not only kindle the people's identification with the land, but also promote interactions between the government and the people. At the same time, the people’ s regional understanding can be relied on to provide localized information that enables environmental workers to quickly grasp river-related information, and ultimately move towards the goal of improving public awareness of the river environment and pollution prevention.

Action of river protection led by volunteers

The main tasks of the patrol teams include reporting polluted and filthy areas to the Water Quality Protection Web, blowing the whistle on pollution cases such as dubious drainage pipes, hidden pipes, or improper disposal of waste (sewage) water. Violators are handled in accordance with the law and followed up on improvements. A total of 11 measures are adopted, including continuously updating the river patrol inspection map and organizing activities such as beach or river cleaning, educational promotion, and achievement reviews.

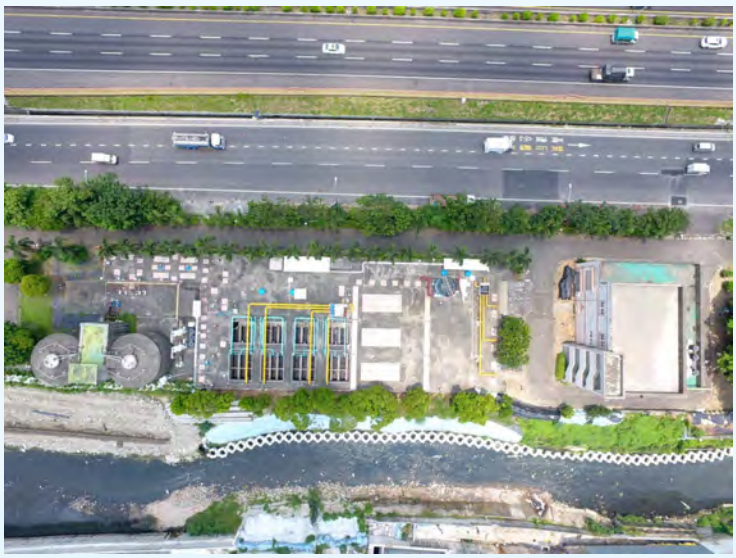
Through a sound replacement mechanism, the City's water environment volunteer teams have demonstrated healthy operation. Teams of low activity are counseled to withdraw, and new teams are invited to join the ranks of river patrols. In 2021, 39 volunteer teams signed up for water environment protection, totaling 1,286 people. Of these, 14 were school teams, in which the teachers taught their students relevant knowledge on water environment protection and led them to regularly monitor and record the water quality of local rivers, thus providing in-depth education on water environment. Twenty-two teams were community groups, which assisted with patrolling local rivers, reporting pollution, and blowing the whistle on pollution. Three teams were corporate groups, which patrolled the waters adjacent to their companies to fulfill their corporate social responsibility. Together, the public and private sectors created a water-friendly Greater Tainan.

Water environment volunteers

6.4 Polluted river remediation

Clear water for sustainable Tainan

Water pollution is an issue of public concern. To emphasize the sustainable use of potable water and water resources, the Tainan City Government actively promotes the rehabilitation of polluted water within the City. It has also formulated "river rehabilitation acceleration and water conservation promotion " policies to carry out the integrated management of river basins. In addition to regularly holding inter-county, inter-organization, and private sector meetings, it also evaluates the number of work targets and adopts innovative actions according to the conclusions of review meetings and recommendations of on-site experts and scholars. The City hopes that the rehabilitation of the City' s polluted water can be shared by the various target competent authorities and competent agencies. In this way, they can jointly strive towards the four dimensions of regulating water, purifying water, cherishing water, and living water, thereby achieving the vision of "clear water for sustainable Tainan".



▲ Aerial photo of Sanye River

▼ Improving the riverbank environment of Zhu River

Estuary of the Erren River

Overseas pollution - Difficult challenges

Tainan City is a prosperous city of industrial and commercial development and also a city of cultural heritage. To enjoy a beautiful water environment while developing its economy, issues such as climate change, uneven rainfall, and major changes in river water quality from continuing wastewater (sewage) discharge from pollution sources must be addressed. Moreover, sections of Jishui River, Yanshui River, and Erren River are severely polluted and have been listed as rivers prioritized for rehabilitation, and in 2020, the severely polluted sections accounted for 15.7%, 5.7% and 24.1% of their respective lengths.

In addition, the sources of pollution are from other counties and cities, the progress of public construction is slow, and the management of irregular wastewater discharge is difficult. Some sources of river pollution in Tainan City come from Chiayi County (Bazhang River), and some from Kaohsiung City (Erren River).

Furthermore, businesses and livestock farmers frequently discharge wastewater illegally. Particularly when the sources of river pollution come from counties and cities, cross-county and -city meetings or other communication methods are required to overcome difficulties in the management of irregular wastewater discharge. Currently, public sewer construction within the City reaches only 57.12% as of May 2021, and nearly 43% of household sewage remains untreated. Hence, control of the overall pollution sources is not easy.

Household pollution reduction strategies

Before the prevalence rate of sewers can be increased through the completion of sewer constructions, the use of local treatment facilities is being adopted as an alternative solution. Coupled with household sewage pollution reduction projects, including: the management of public sewer systems and designated community sewer systems, regular cleaning of sludge in septic tanks (including building sewage treatment facilities, and educational promotion on the reduction of household sewage pollution), household sewer pollution reduction efforts will continue. In 2011, to reduce the pollution level from household sewage, the City Government announced relevant regulations pertaining to the discharge frequency, disposal method and treatment site of sewage treatment facilities (septic tanks) in elementary schools and apartment buildings 10 stories or taller within the City's jurisdiction, totaling 807 buildings designated for disposal watch. As of September 2020, up to 49,243.4 metric tons in volume of night soil (septic tanks) were disposed, reducing BOD by about 16,004 metric tons.

Business pollution reduction strategies

All businesses on the City' s watch list are subject to inspection and control. Different levels of inspection and sampling frequency are carried out for sewer systems in industrial areas in combination with wastewater treatment plants, and sewer systems in industrial areas are managed according to levels. In 2020, graded inspections were conducted on all key watersheds in Tainan City. For those with previous violation records and major pollution discharge sources, the frequency of inspection increased and the water quality was sampled in the hope of reducing wastewater pollution from business discharges. Furthermore, nighttime inspections were conducted regularly 5 days a week, and designated personnel available 24 hours to receive complaints from the public. Early Bird Project, Night Heron Project, and Pollution Hunter Operations were conducted to inspect businesses to actively ensure water quality and environmental quality within the City. To understand the positions of the effluent outfalls of businesses not on the watch list, a map of business distribution in 9 major industrial zones and drainages was being completed to improve the efficiency of inspections.

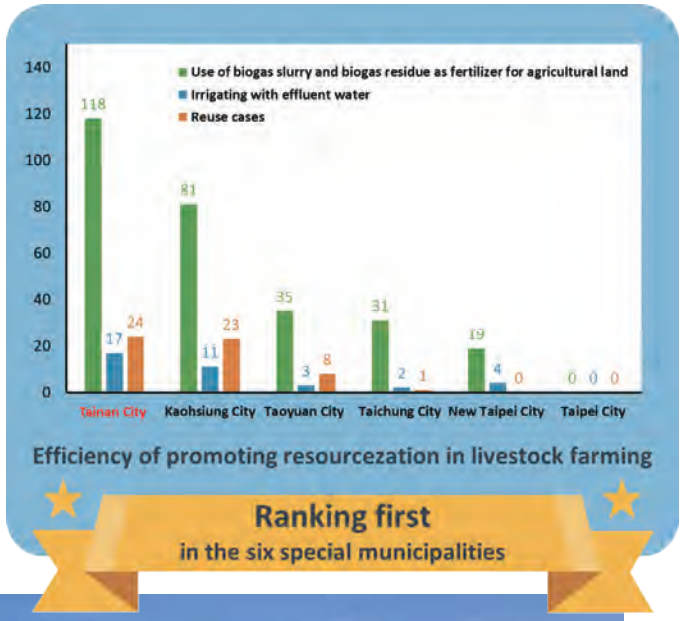
Sewage testing by the Environmental Protection Bureau

Inspecting soil pollution

Livestock farming pollution reduction strategies

The City places all of the livestock farmers on the watch list and inspects and controls them accordingly. The resourcezation of livestock manure is promoted, and livestock manure is used to fertilize agricultural land. Tainan City ranks fourth in the nation in terms of the number of pigs. Among the key rivers on the watch list of the Environmental Protection Administration, the Jishui River Basin is the most seriously polluted by livestock farming. The long-term consequence is poor water quality found at the Jishui River Bridge testing station on Provincial Highway 19A. Promoting resourcezation in livestock farming is one of the City' s priority issues. For this reason, the City' s Environmental Protection Bureau and Agriculture Bureau will continue to jointly work on the promotion of resourcezation plans for livestock wastewater, and promote the efforts related to the resourcezation of livestock wastewater. The resourcezation of livestock wastewater includes the use of biogas slurry and biogas residue as fertilizer for agricultural lands, and cases of reusing agricultural waste and treating it until meeting the standards of effluent water to recycle water resources, which will lead to the four-win situation of reducing polluted livestock wastewater pollution discharge, reducing the operation and maintenance costs of wastewater treatment facilities, reducing the use of chemical fertilizers, and obtaining carbon rights and green electricity for enterprises, thus achieving the goals of saving water, reducing pollution, reducing the use of chemical fertilizer, and lowering costs. In addition, through establishment of biogas centers or a combined sewage treatment plant, livestock manure is collected in a centralized manner, thus reducing the amount at the source while generating biogas for energy reuse.

Reusing biogas slurry and biogas residue as fertilizer for agricultural land



Reusing biogas slurry and biogas residue as fertilizer for agricultural land

6.5 Sustainable water management projects

Won the 2021 FIABCI-Taiwan Real Estate Excellence Awards

In order to implement Tainan's "environmental sustainability" policy, the City Government actively promotes and incorporates the spirit of water environment into various water management projects. The climate pattern of short and heavy rainfall requires an overall drainage system, pumping devices or comprehensive flood control. In addition to the continuous allocation of water control funds, the City Government will actively seek subsidies from the central government and promote various construction projects of flood control with conscientious spirit.

The 6 major water control projects submitted by Tainan City to the "2021 FIABCI-Taiwan Real Estate Excellence Awards" were all affirmed by the organizer and the review panel and won "2 Gold awards and 4 Quality awards". Among them, "Zhu River" won the Excellence and Quality Awards for 2 consecutive years.

"Yuejin Harbor Water Environment Improvement Project" won the "Gold Award for Best Environmental Culture"; its core concepts are "Site Restoration", "Flood Control and Water Storage", "Breakpoint Connection", "Water Purification", and "ecological friendliness and habitat creation". The existing park areas and trails are preserved, and the environmental features of the old river water ecology and natural habitat of Yuejin Harbor are reproduced. "Anshun Drainage Water Purification Plant" was awarded the "Gold Award for Best Management and Maintenance". In recent years, Anshun drainage has been affected by animal husbandry, industrial and domestic sewage such as Shanhua, Anding and Wukuailiao, and the water quality has been seriously polluted. In order to effectively improve the water quality, the City built the Anshun Drainage Water Purification Plant and actively sought subsidies from the Environmental Protection Administration. The Plant was completed in 2020, and the daily water treatment capacity increased from 6,000 to 10,000 cubic meters, substantially improving the pollution of Anshun drainage tributaries in the Yanshui River Basin.

"Yuejin Harbor Water Environment Improvement Project" to build a new bicycle steel bridge in the water area of Gong 18-3 to solve the problem of traffic interruption

"Landscape Improvement Plan around Zhu River Basin - Ecological Pong Reach Plan" and "Green Energy Science City Sewage Management Project" won the "Best Construction Quality Award"; "Tainan City Yanshui District Yuejin Harbor Water Quality Improvement and Sewage Interception" and "New Construction of the City' s Land Rezoning and Pumping Station in Bei'an Commercial District, Annan District, Tainan City" won the "Best Planning and Design Quality Award". Zhu River and Yuejin Harbor are not only water and flood control projects, but also integrate the sustainable concepts of ecological environment development to provide a "good place" for the family, old and young alike, to relax and have fun. The Water Resources Bureau said that the various water control projects to be promoted in the future will also consider the aspects of ecology and landscape in order to jointly create a high-quality living environment in the Greater Tainan.

Anshun Drainage Water Purification Plant

"Zhu River Basin Landscape Improvement Project" adds Yuejian Bridge, whose reflection in the lake resembles a crescent

SDG 07 Affordable Energy

Ensure that all people have access to affordable, reliable, sustainable, and modern energy

To ensure access to affordable, reliable, and sustainable energy for everyone, develop green energy through cooperation of citizens, increase utilization ratio of energy, drive development for green energy, and achieve the vision of low-carbon green energy, Tainan City is the first in the nation to promote the "Solar City Project" by setting up a task force to match applications and needs from all walks of life, making good use of the advantages in local solar energy and complete chain for green industry, thereby leading Tainan to gradually realize the vision of a city of green energy.

7.1 Increasing the installed capacity of photovoltaic systems

Solar City 2.0 Project

Tainan promotes the Solar City 2.0 Project by setting up the single-window service, with the industrial foundation formed by up-, mid- and down-stream green energy manufacturers, and systematically promoting the five major rooftop PV installation: solar official buildings, solar rooftops, solar communities, green factories and farm sheds, as well as five major ground-mounted PV installations: salt fields, water spaces, landfills, green energy land, and green energy facilities.

Formulating the key points for the implementation of photovoltaic systems

Tainan took the lead in the nation to formulate the key points for the lease by tender on municipally managed government-owned premises for installation of photovoltaic power generation systems and processing the bidding application, including district offices, activity centers, police stations, public retail markets, etc. Exemplary installations on public premises demonstrate the government's determination to promote the green energy policy and disclose different photovoltaic setups according to the individual needs of the public, large electricity consumers, system manufacturers, financing companies, etc., with over 260 instances of applications processed.

Building a low-carbon economy

In order to improve the implementability of the policy, we allocate funds every year, formulate a subsidy plan to encourage the installation, and coordinate with banks to set up photovoltaic financing projects. Currently, Cathay United Bank, Bank SinoPac, Hua Nan Bank, Chang Hwa Bank, and Taiwan Business Bank have responded to the effort to jointly build a low-carbon economy.

Highlights for the promotion of photovoltaic facilities

Google purchased 10MW (1 gigawatt) of green electricity from Tainan City as the power source for its newest database in Asia. With well-known leading tech-companies such as InnoLux, HannStar, Getek and WNC having successively returned to invest and set up factories, statistics have shown that from 2011 to the end of July, 2021, there were 8,364 applications in total that had been put on file, with a capacity of 2,266MW and the estimated annual power generation of about 2.93 x 109 kWh billion degrees, nearly 10.6 times the annual power generation of Zengwen Hydropower Plant. The power generated can provide electricity for nearly 835 thousand households every year, and the annual carbon reduction is about 1.49 million tons, which is equivalent to the amount of carbon reduction contributed by 4,579 Tainan Parks and attracts nearly NTD 158.6 billion in investment. The short-term target is to reach 2.25GW of photovoltaics cumulatively in 2021, and the long-term outlook is 4.5GW by 2030.

7.2 Expanding Solar City 2.0 Project

Setting up green energy rooftops to generate electricity

The City has been pushing for five major rooftop PV and five major ground-mounted PV projects and has been promoting the scheme of "Green Energy on Every Roof" to become one of the exemplary cities for supporting the policy of the central government. As of now, the roof potential inventory has been completed, the regional operators for the City's 37 administrative districts have been selected, a consultation line for installation of green energy rooftops has been set up, a consultation window has been set up for installing photovoltaic facilities on illegal structures through coordination of the City Government's departments and bureaus, the certification of equipment under 2,000 Watts processed, and residential, commercial and industrial users coordinated to lease their roofs for the bid-winning operators to set up green-energy rooftop panels for power generation.

Drawing up subsidy plans to encourage installation

Tainan allocates funds every year and draws up subsidy plans to encourage installation. The City Government allocated funds for 2021 to subsidize installation of photovoltaic systems on legal private buildings and illegal rooftop structures of legal private buildings within the City, including newly developed communities, the public or enterprises participating in the "Green Energy on Every Roof" scheme, etc. The subsidy rates are divided into 10 items, such as Taipower-related line fees, solar communities, and self-use or energy storage type, which cover almost everything.

Setting up a consultation hotline for installation on illegal structures

After consulting with the City Government, applications may be filed for installing a photovoltaic system on illegal rooftop structures according to the regulations, which shall be submitted with a technician's signature for structural safety. However, installation is not allowed for the rooftop escape platform, buildings with two or more illegal floors, or those affecting public safety. It's expected to increase the potential of rooftop PV installations. In line with the announcement "the scope of public safety affected by installation of photovoltaic facilities on illegal roof structures of legal buildings within Tainan City and methods of consultation", Tainan City Government established a consultation hotline for installation on illegal structures to provide consultation services.

For Solar City 2.0 Project, with 5 major roof PV and 5 major ground-mounted PV systems, statistics up to July of this year have shown having reached 8,343 cases, with the capacity exceeding 2.2GW (where the roof PV is approx. 0.7GW and the ground-mounted PV is close to 1.5GW). The estimated annual power generation is about 2.93 billion degrees, nearly 10.6 times the annual power generation of Zengwen Hydropower Plant which can be used for supplying nearly 835,000 households for use of electricity every year; the amount of annual carbon reduction is about 1,49 0,000 tons, which is equivalent to the amount of carbon reduction for 4,579 Tainan Parks. The goal is to reach cumulative 3.25GW by 2025, with an outlook toward 4.5GW by 2030.

Photovoltaic systems for parking lots

7.3 Increasing thermal power generation from incineration

In addition to sufficient raw materials for incineration, the use of thermal energy in the incineration plant to generate electricity is not constrained by weather. The annual amount of thermal energy generated by the incineration plants in Tainan has been stable, and the incineration plants are playing an important role in the City' s development of renewable energy. There are two waste incineration plants in the City: Yongkang and Chengxi Incineration Plants, which generated 249,150 MWh of electricity annually on average from 2018 to 2020. After deducting the electricity used in the plants, the electricity supplied to Taipower every year is 197,814 MWh on average, capable of providing electricity for the use of approximately 610 thousand households.

Renovation and maintenance works for the Incineration plants

Having operated for more than 20 years, Chengxi Incineration Plant underwent the renovation project from September 17, 2020, to November 4, 2020, in which the operations of the incineration plant, such as the steam turbine generator, instrument air compressor and boiler system were the key items for maintenance and inspection. For Yongkang Incineration Plant, in addition to biannual maintenance and repairs for its boilers, steam turbine generators and other equipment, the annual repair was carried out in the second half of the year 2021, in which the steam turbine generator was disassembled for major equipment maintenance in the hope of improving power generation efficiency.

Setting up a monitoring system for air pollution

In response to the regulations set by the Environmental Protection Administration, both incineration plants in this City have in place continuous emission monitoring systems (CEMS) that provide real-time information to the public for inquiries on the official website of the incineration plant. Yongkang incineration plant is currently improving and upgrading its selective non-catalytic reduction (SNCR) and CEMS in order to better discharge air quality and maintain the quality of the environment around the incineration plant while having highly efficient power generation.

Chengxi Incineration Plant

7.4 Increasing the annual power generation of landfills

Building solar farms on landfills to develop renewable energy

To actively develop renewable energy, Tainan City is moving toward becoming an exemplary city of solar farms on landfills, transforming the closed landfill into a site for generating renewable energy. Under collaboration from public and private sectors, landfills in the City, such as those in Annan and Xinying Districts worked with ECOVE to jointly build a ground-mounted photovoltaic system, making it Taiwan' s No. 1 solar farm on landfills in terms of the installed capacity.

Public-private partnership to develop the green energy policy

Under public-private collaboration, the government leases the land of closed landfills, on which private companies build and finance before operating and maintaining the photovoltaic systems, jointly creating a win-win situation from development of green energy policy. It is hoped that this model and sharing of experience in the promotion effort can also provide reference for other counties and cities when using landfills to develop renewable energy, thereby creating a low-carbon city and home together.

Solar Farm at Jingliao Landfill in Houbi District

Announcement on incentives

In 2020, the City added Jingliao site in Houbi District to increase the installed capacity by 0.85MW, with a total of 13 landfills (including rooftop PV) completed for installation of PV facilities with the installed capacity of 15.593 (MW). The annual power generation is up to 19 GWh, which increases the City' s annual revenue by approximately NTD 11 million and reduces carbon dioxide emissions by about 10 thousand metric tons. In 2021, the City formulated "the key points for feedback from the installation of photovoltaic power generation facilities on the closed public landfills in Tainan City", and through the feedback mechanism the installation of solar energy facilities has been effectively promoted.

Solar Farm at Xinying Landfill

7.5 Guidance on the reuse of biogas in ranches

In the past, waste from ranches was not properly disposed of, which not only caused wastefulness, but also generated unpleasant odors and environmental hygiene problems. If the biogas generated from animal waste in the ranch is properly collected, it can be used as energy for power generation and manure fertilizer to recycle animal waste, creating a circular economy and benefits, and improving environmental problems.

The City cooperated with agencies such as the Council of Agriculture, the Bureau of Energy, the Industrial Technology Research Institute (ITRI) to promote the benefits of reusing biogas of ranches within the City, and invited ranches to participate in the briefing sessions to convey new concepts and policies. In 2020, 1 ranch was guided to implement biogas power generation and 7 ranches were guided to implement the reuse of biogas.

Equipment for biogas power generation

SDG 08 Decent Work and Economic Growth

Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all

Tainan City creates a friendly industrial environment, provides enterprises with necessary assistance, increases the capabilities of industrial upgrade and innovation, develops local characteristics and promotes economic development, with the aim of creating more job opportunities and building a secure working environment.

8.1 Heat hazard prevention advocacy for business units

Prevent heat-related illness in the high temperature environment

Global temperature has been hitting new highs repeatedly in recent years and Taiwan sees an increasing frequency and duration of high temperatures. In mid-May this year, Tainan City' s temperature hit a new high of nearly 40 degrees Celsius. The hot climate which leads to thermal hazards in the work environment poses a threat to the workers as it could easily cause heat-related illness such as heat stroke, heat exhaustion, heat syncope, heat edema and heat cramps. It can even affect the workers' normal judgment or operation during work, resulting in wrong judgment or negligence at times, thereby leading to other unnecessary occupational accidents to outdoor workers. To safeguard the workers' health, the City conducts occupational safety and health counseling visits on business units engaging in outdoor work, to advocate early warning and prevention of heat hazards.

Convene Occupational Safety and Health and Disaster Prevention Visitation Conference

In line with the Mayor' s policies for improving workers' working environment and safeguarding their safety and health, the City regularly conducts the annual occupational safety and health and disaster prevention visitation conference for the counseling members to convey the City Government' s policies to the counseling members, and enhances the members' professional knowledge, together making Tainan a home full of hope where people can live and work well.

Employers set up effective heat hazard preventive measures

To safeguard the health of outdoor workers, an annual target progress table is established. Through labor inspection, we supervise and urge employers under the jurisdiction of the City to adopt effective measures to prevent heat hazards, safeguarding the safety and health of outdoor workers, and thereby preventing the occurrence of heat-related illness, making Tainan City a "city of occupational safety" and a home full of hope. Labor inspection includes:

- Education on prevention of heat-related illness for workers
- Regular inspection by dedicated personnel before and during operation
- Make use of protective tools and enhance preventive measures for various heat hazards
- Provide shaded resting place
- Sufficient drinking water or sports drinks
- Avoid engaging in intensive physical work at or around noon
- Establish emergency medical, notification and response mechanisms

Promote small and medium enterprises subsidy application

The City Government cooperates with Southern Occupational Safety and Health Center of the Occupational Safety and Health Administration (OSHA), and actively promotes the application of small and medium enterprises for subsidies to improve hazard prevention facilities or equipment in high temperature outdoor operation. OSHA' s subsidies include shading devices or facilities; equipment or tools that reduce workplace temperature; personal protective equipment such as shading devices, sprinkler cooling equipment, or ice vest that can reduce heat stress, etc. For SME (below 299 employees), the maximum subsidy of high temperature protective equipment is NT$500,000, and that of personal protective equipment is NT$50,000.

8.2 Promote the SBIR program in local industry

In order to achieve the vision of a non-nuclear homeland, and list green energy technology industry as one of the "Five Plus Two" innovative industrial policies, under the guidance of the Executive Yuan, the cooperation of the Ministry of Economic Affairs, the Ministry of Science and Technology, the Atomic Energy Council, Tainan City Government and industry-university-institute will make Tainan Shalun a green energy science city, which will act as the green energy development hub of Taiwan, and based on four key aspects: innovation, energy saving, energy storage and system integration, drive Taiwan's green energy industry by supporting green energy research and development and demonstration plans.

Tainan City's green energy technological development policies

Tainan City's green energy technological development policies comprise three key directions: "green energy transportation", "renewable green energy" and "power-efficient green energy", while the five points cover "solar power generation", "LED lighting", "green buildings", "ESCO" and "electric vehicles". For a steady implementation of renewable energy development, the City's development guidelines comprise:

- Introduce new technologies and promote innovation, foster domestic competitive or key industries
- Target technologies of important trends to set up application fields and encourage enterprises to engage in innovative research and development and transformation
- Assist startups in having a sustainable way of thinking in operation, link up local and central resources

Encourage startups by providing subsidies

In line with the central government's policies and based on categories such as "trendy and autonomous, digital transformation and smart roaming, high quality food and medicine, green energy technologies, 5G leading, innovative business", encourage the City's companies to invest in innovative research and development, thus injecting vibrancy into the economy. Over the past 10 years, a total of 780 cases have been passed, creating NT$8.2 billion output value by enterprises. It also led to 323 surrounding industrial academia cooperation cases, creating 2,516 jobs for Tainan City.

8.3 Carry out industrial park development projects

Comprehensively review the City's industrial parks

To accelerate industrial development, the City develops industrial parks on its own, so as to create economic benefits and provide job opportunities. In line with the new thinking of a national spatial plan, proactive methods are adopted to comprehensively review the industrial parks under the jurisdiction of the City. Supporting measures for transformation development are also established to resolve the deadlock of stagnant land development of some industrial parks.

Develop industrial parks

Statistics shows that as of end of July 2021, the City Government has independently developed and completed 4 industrial parks: the Tree Valley Park, Liuying Technology Industrial Park, Yongkang Technology Industrial Park, and Sinji Industrial Park. To cater to the requirements of returning Taiwanese businessmen and the demand of the mass production base neighboring Shalun Science City, the development of Cigu Technological Industrial Park and review of green energy industrial park are currently in progress.

8.4 Development of Tainan's forward-looking industries

Driven by the two major catalysts, Southern Taiwan Science Park and Shalun Smart Green Energy Science City, the City's industrial cluster has become more complete. In addition, the City Government continues to actively work with the central government in driving national strategic forward-looking policies, such as 5G, digital transformation, and AIoT, assisting local industries in their overall transformation or raising their capabilities, and continuing to strive toward the goal of sustainable development. The City also actively attracts investments from low pollution, low water consumption, low energy consumption and high value added industries. Statistics show that from January 2019 to October 2021, there were 884 new investment projects, attracting NT$96.4 billion investment value and creating NT$178.4 billion output value. It is expected to create 29,176 job opportunities, where the majority are from the metal products, machinery, plastic products, and food industries. Besides semi-conductor companies, Tainan also attracts investments from the leading companies of the manufacturing and service industries, which shows that they are optimistic about Tainan's economic development prospects and see Tainan as the city of the highest investment potential in Taiwan.

SDG 09 Industry, innovation and infrastructure

Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation

A city’s improvement and sustainable operation will play an important role in the country’s future development. To practice energy transformation, Tainan City guides the City’s consumers with over 800 kilowatts of contract capacity in setting up solar photovoltaic systems, and assists youths and enterprises in obtaining funds, and thus innovation and development opportunities. Also, in order to raise urban ecological regulation ability, the green area continues to increase in terms of urban planning, and resilient infrastructure is built, which will help realize the vision of a sustainable eco-city.

Shalun Green Energy Technology Demonstration Site - Regional Power Management Center

AU Optronics Corp

9.1 Establish a certain ratio of renewable energy

Promote green factories and offices
Encourage the use of solar photovoltaic and clean energy

To establish a nuclear-free homeland, and accelerate the promotion of economic growth to practice energy transformation, we have to widely set up photovoltaic systems, wind power generation, storage equipment, etc. Hence, the City adopts diverse and flexible measures to guide big electricity consumers with contract capacity ranging between 800 and 4,999 kilowatts in using or obtaining a certain proportion of renewable energy.

Provide companies with diverse and flexible measures and options

Big electricity consumers setting up renewable energy can reduce carbon emissions during manufacturing processes and increase enterprises' product environmental value. To help reduce the minimum requirements of setup and remove the setup barrier, the City, in line with the amendment of regulations of the central government, provides companies who are unable to install solar photovoltaic systems, with more diversified green energy options.

In March 2020, the four types of implementation methods were officially announced:

- Set up 10% contract capacity solar photovoltaic installation
- Set up energy storage equipment
- Purchase renewable energy electricity and certificate
- Pay deposit

As of August 2021, Self-Government Ordinances announced that out of the 647 households, 354 have completed review, 242 have applied to be removed, and 41 are undergoing counseling. The total installed capacity is more than 145MW, with an implementation rate reaching 93.66%.

9.2 Assist small and medium enterprises in obtaining credit guarantees

Establish the Promotion Office for Strengthening Enterprise Financial Response

To assist youths and enterprises in obtaining funds, and hence innovation and development opportunities, the City set up a service counter through an integrative counseling program in September 2020 and conducted youth entrepreneurship and SME credit guarantee review, providing diverse consulting services, such as assisting enterprises in applying for comprehensive consulting in starting a business, incentives and subsidies, financing and loan application, course training or other startup resource referral, and one-to-one counseling. Small and medium enterprises who have less resources are able to focus on the innovation and breakthrough of their own technologies, boosting the energy of industrial growth.

Arrange enterprise on-site visits

In line with the implementation guidelines of "Tainan City Government Youth Entrepreneurship and SME credit guarantee and financing loan" and Taiwan Small & Medium Enterprise Counselling Foundation program, enterprise diagnosis and counseling were conducted. Forty on-site visits were completed to diagnose enterprises from September 2020 to June 2021, with a 100% completion rate. Among them, 27 cases were received by the credit guarantee review committee, where 8 cases were passed, with a passing rate of 50%. The amount of the cases received was NT$39,510,000, and the amount granted was NT$9,250,000, at a rate of 38.07%.

SDG 11 The Sustainable City

Creating an inclusive, safe, resilient, and sustainable living environment in the City

One of the administrative goals of Tainan City Government is to create a sustainable environment for residents. The City Government emphasizes the importance of "Global Vision and Local Action" in terms of urban development. Adopting the administrative concepts of low-carbon life and sustainable management, the City aims to build a low-carbon city and a tourist wonderland, hoping that by working with the residents, we will make The Greater Tainan a low-carbon, sustainable city.

The Highlight of Sparkling Canal:The Da-Liang Park

11.1 The Green Life in a Low-Carbon City

Building the Green Xanadu

Tainan City Government has vigorously implemented the "One Park for One District" Program to build a green energy-based, low-carbon city and increase green space, making the City an admirable green city. Until now, the City has built 524 parks on 805 hectares. The goal is to increase the cumulative area of the parks by 10 hectares and plant as many as 20,943 trees by 2030. Actively increasing parks, green space and urban afforestation in the City is an effective way to mitigate the problem of carbon emissions, improve the urban landscape and create the green space friendlier and more accessible to the public, optimizing citizens' sense of well-being.

Developing Featured Parks in Tainan City

For those dealing with the hustle and bustle of city life, parks are like the oasis in the desert, where they can enjoy a relaxing getaway in nature. One of the City’ s policies is to build featured parks. The launch of the program has contributed to the increasing number of parks in Tainan City. Ten featured parks have been completed, including the airplane themed Daen Park, the Minghe Park that built the featured playground on the basis of the natural landforms, the Shuipingwun Park that boasts the largest compound playground, the Xianghe Park equipped with a sand pit and the longest slide, etc.

District was built in a way that actively took the needs of the target users into consideration by allowing citizens to vote for their favorable themes. As the result, the theme “Fun Deep Sea Adventures” received the highest votes. For the first time, parents were invited to the workshop with their children to outline the direction of playground planning, which was then discussed among experts and scholars to reach a consensus in order to make sure the design of the park conforms to a desirable playground for children.

In the future, Tainan City Government will continue to consider the needs of citizens while designating other suitable sites, in order to provide them with a rich urban life through multi-functional services and initiates and build numerous parks to create the City’ s lungs.

The featured playground of Gangbin Historical Park in Anping District of Tainan City is estimated to complete in April, 2022

The Vision of the Floor Plan of the Gangbin Historical Park in Anping District

Sustainable Afforestation, Build the City's Lungs

The City fully complies with the new policy "Multi-Guidance Program of Sustainable Forestry" promoted by the Forestry Bureau of the Council of Agriculture to mitigate increasing atmospheric carbon dioxide, increase carbon sequestration, improve the water quality of afforested land, and promote biodiversity.The tree growers who have been participating in the encouragement of afforestation for more than 20 years will be rewarded with multi-guidance. Besides production of timber-related products, diverse forestry-associated industries, such as forest recreation, forest healing, and under-forest economy, are included in the scope of guidance.In recent days, the Council of Agriculture encourages forest workers to use domestic wood more frequently. To do so, the Council not only provides free seedlings, but also annually awards afforestation bonus to forest workers. This creates incentives for people to join afforestation.

Stating this year (2021), the City aims to reach at least 1 hectare of afforestation every year based on its policy' s target. In 2030, the City' s hills will be covered by over 10 hectares of forests, which will make Greater Tainan full of green spaces and vitality, help protect the Earth' s ecosystem, and create a better life for future generations.

Community Development, the New Opportunity

The purpose of community development is to enable the residents to speak up for their living environment and choose and build the lives as they want. It will raise the residents' hometown identity, and encourage them to voice their opinions about the place they live in.In other words, the purpose of community development is more than constructing certain physical facilities. The most important thing is to build an integral community by the residents' participation in order to increase the life quality.

Arbor Day, the Coastline Afforestation to Safeguard Tainan

The Gold Award of Tainan Corner Landscape Design: Slow, Roaming, Overgrowing
by Xuejia Simple Living Association and Ming Chuan University.

Avocado Farming Cultural Activity in Danei District.

Evolution of Old Buildings with Dragon's Love and Jade's Will in Guoyi Community, Liuyin District, Community's Cultural Landscape Development of 2021 Yuan Ye Awards.

ArtGrowerHouse in Daqi Community, Guantian District, Community's Cultural Landscape Development of 2021 Yuan Ye Awards.

Rebuilding Your Own Community

The City promotes the strategy of rebuilding the community. It starts from community development to community revitalization and trains community planners to enlighten the youth and the elderly. The residents will be led to follow the community's issues and attend the community's activities in a bottom-up manner. Everyone in the community becomes the strength of the community by giving his or her own influence to create a sustainable and revitalized community that boasts special and unique features.

The City promotes the community revitalization and environment development based on three major plans: "Development Plan of Tainan Corner Landscape Design", "Training Plan of Green Communities", and "Development Plan of Community Development Phase 3 and Village Culture". The plans aim to lead and introduce different age groups, including undergraduates, those who just graduated, those who just became part of the workforce, the youth, the elderly, retirees, and people who have interest in the plans, to the development of the community. In line with Tainan City's Urban and Rural Landscape Development Plan, the City will make necessary adjustments every year to perfect the work.The plans consist of issues about charming cities, sustainability, and ecology. By using the development methods, such as creative aesthetics, low-carbon planting, in combination with the implementation spirit and promotion of community development, the City plans to build 293 environmental reconstructed communities, raise ecological awareness, and accumulate 160 beatified community development locations by 2030, which will make Tainan City a sustainable and livable city step by step.

11.2 Building High-Quality and Sustainable Public Transportation

Tainan City Bus

Bus Routes' Network Upgrade

To increase the passenger capacity of the City' s public transportation and improve its environment and service quality, and practice low-carbon transportation, the City introduces universal design concepts and considers the needs in an increasingly aging society.The City will analyze the performance and reasonableness of the city bus' s network, routes, and schedule to achieve optimization and make adjustments by using users' feedback, such as suggestions directly from passengers or those reflected by district executive/chief of village/public representative to convey people' s recommendation, and the actual passenger number data evidenced by the city bus e-ticket data.Downtowns like city centers will be continuously providing bus routes and stops to decrease private vehicle possession and avoid traffic jams regionally. The City aims at a 25% growth in the passenger capacity of public transportation by 2030 compared to that in 2017, providing citizens with a better life and better means of transport.

Because of the pandemic, the passenger number of the city buses has decreased by 23.6% compared to that in 2019.In addition, the domestic pandemic worsened in 2021. While the bus passenger number is closely related to the pandemic change, it will take some time for the number to recover.Therefore, the City will review and adjust the network of the bus routes during the time of lower transportation demand, while continuing to strengthen the preventive measures of Covid-19 and offer preferential tickets, in order to increase passenger numbers by restoring their trust and provide citizens with a safer, easier and more comfortable public transportation service.

The Taiwan Tourist Shuttle

The Taiwan Tourist Shuttle is the bus service especially designed for traveling.Those who do not want to drive a long way or join a group tour can travel to various major tourist attractions throughout Taiwan by taking the shuttle service from the stations of TRA or THSR near the attractions.Taking the Taiwan Tourist Shuttle is the perfect way to plan a carefree tour by yourself. It also conforms to the new concept of energy-efficient, low-carbon, eco-friendly traveling.

For the Taiwan Tourist Shuttle services in the City, we will analyze the performance and reasonableness of the network, routes, and bus schedule to reach optimization and make adjustment by using users' feedback and the actual passenger data evidenced by the city bus' s e-ticket data.The goal is to reach a total of 280 thousand rides by 2030. However, under the influence of the pandemic since 2020, the passenger number of the Taiwan Tourist Shuttle dropped significantly, and the domestic pandemic worsened in 2021.Since sightseeing busses are not taken by citizens, and travelers are less willing to take sightseeing buses when considering pandemic prevention and enclosed space which they have to share with strangers, the City will review and adjust the sightseeing bus services during the lower transportation demand, while continuing to strengthen the preventive measures of Covid-19 and offer preferential tickets and other promotional activities, in order to increase passenger numbers by restoring their trust.

Ling Po - Guantian Line of the Taiwan Tourist Shuttle officially available on September 4, 2021.

Press conference of the self-driving bus management team signing the Memorandum of Understanding (MOU).

Trial Run of Self-driving Bus

The passenger transportation industry has been bothered with the problems of lack of drivers and excessive working hours.Self-driving technology will bring a revolutionary change to urban transportation. This technology will overcome the limitations arising from problems such as lack of drivers, long working hour, driving safety, vehicle dispatch, and rural transportation.

The Tainan City Self-driving Bus Trial Plan started in March 2020 and has been implemented in the Southern Taiwan Science Park (STSP) and Shalun Green Energy Science City, both symbolic of technology, intelligence, and industry.Because the plan is in the phase of research and planning, we have initially selected the STSP Station - STSP Museum of Archaeology circular line and Shalun Green Energy Science City circular line, which have lower impact on traffic, as the demonstration routes and run on weekends or holidays.

The plan has completed the tests carrying and not carrying passengers in the first year.In the second year, there are four major upgrades in the plan.(1) Vehicle upgrade, which will be made by the technology manufacturer;(2) Intersection upgrade, which transmits traffic signs and road images to the on-board computer for computation;(3) Technology upgrade, which adds new functions such as obstacle avoidance, object tracking, and optimizing sign recognition;and (4) Operation upgrade, which includes local bus operators into its management and charging the same fares as the local buses.

Although the plan is still in the trial stage, the local bus operators and bus manufacturers are all included in the plan to test the technology. If the industrial scale grows large enough to lower the operation cost, it will help the transformation and development of the public transportation. In 2021, there were 10 sessions of trial rides organized to increase people' s acceptance, in which over 800 passengers took part. Most of the people gave positive feedback and looked forward to the buses' officially running on the road.

Self-driving Bus in Tainan City

11.3 Tainan's Cycling-Green Means of Transport

Promoting Tainan City's T-Bike

The City encourages people to ride bicycles as short distance means of transport by means of the public transportation, bikeway, and bicycle rental services. Using shared bicycle as short distance means of transport will reduce and transfer the possession and usage of private motor vehicles and lower traffic jam, environmental pollution, and energy consumption. This will also help complete the last mile service of the public transportation system.

In August 2016, Tainan City began its T-Bike service with only 10 stations and 280 bicycles. Now in mid-2021, there are 77 stations and 1,824 bicycles available in the City' s 13 administrative districts.On average, about 50 thousand people use T-Bike every month. The total number of T-Bike users reached 3.36 million in mid-2021.It is clear that T-Bike has won people' s favor and become an important means of transport for those commuting and traveling. It not only replaces private vehicles, but also helps people work out, save energy, and reduce carbon emissions.

In the future, the T-Bike' s system reset and overall operation strategy will be constantly assessed. Every year, we will review every station' s performance and suggest new spots of installation coming from all walks of life. The terminal station with lower usage rate will be moved to locations of greater popularity and potential. We will also keep monitoring the synergistic effect between stations and districts to increase the overall usage rate of T-Bike. The goal is to have a total of 7.03 million T-Bike users by 2030 and strengthen the last mile service of the public transportation system, giving citizens and travelers greater convenience and accessibility.

Shared Scooter in Tainan City

Expanding the Service Area of Shared Green Vehicles

Recently, shared green means of transport (e.g., bicycle or scooter) has become globally popular and common. To decrease private vehicle possession, the City provides flexible vehicle choices through shared green vehicles. It' s hoped that shared vehicles can ease the demand for parking, make up for the deficiency of public transportation, and help achieve the targets of saving energy and reducing carbon emissions.

The City has many exclusive tourism resources like historical buildings, monuments, temples, local festivals, cultural landscapes, natural ecology, agricultural produce, delicious street food, and shopping districts.Besides promoting the development of tourist attractions, the introduction of a shared green vehicle system will provide a friendlier market, more diverse shared green vehicles, and better incentive for choices. Thus, people can make better choices because of a wider array of shared green vehicles. The goal is to expand a total of 65 square kilometers in terms of the service area of shared green vehicles by 2030.

T-Bike in Tainan City

Buses Fully Go Electric

In recent years, there has been an increasing awareness of environment protection. The means of transport going electric conforms to the low carbon trend. There are more and more people buying electrical vehicles to replace the old diesel ones. People urged that diesel buses should be replaced by electrical ones. This is why the Mayor has always taken electrical bus policy seriously.

Since the Executive Yuan drew up the policy of public buses fully going electric by 2030, the City Government began promoting the development plan of electrical buses in 2019, in which the vehicles of city buses, both main lines and branch lines, will be progressively replaced by electrical low-floor buses.There are 422 buses in the City, including 50 electrical ones, which account for 12% of the total, and have plenty of room for growth. After the plan of city buses going electric started, it' s estimated 30 old buses will be replaced with electrical low-floor ones every year, which will increase the ratio of electrical buses by at least 7%, and reduce the annual carbon emissions by about 1,040 tons. The goal is to replace all the old buses with electrical low-floor ones by 2030.

In this policy of promoting electric buses, bus operators play a critical role. Beside the corporate social responsibility of saving energy and reducing carbon, the operators also care about the increased benefit and reduced cost brought about by replacing the diesel buses with electrical ones. Therefore, the City Government formulated the "Regulations Governing Subsidies for Tainan City' s Passenger Service Providers Purchasing Low-carbon Vehicles" to raise the funds for subsidizing the operators' vehicle purchase. The City Government also drew up reasonable subsidy standards for operating losses according to operation characteristics of electrical buses in the hope of attracting more operators to invest in the electric city buses by easing their financial burdens, and making Tainan City a higher-quality, friendlier, and more sustainable public transportation environment.

Tainan City Electrical Bus

Blue Sky in Tainan

11.4

Protecting the Environment, Building a Livable City

Clean Air, Bright Sky

Air pollution has always been a public issue concerning many people. Influenced by local topography and meteorological condition, the City has poorer atmospheric dispersion in fall and winter. The air quality worsens easily because of local pollution and pollution from windward counties/cities. Therefore, the City integrated its 18 departments/bureaus to promote "Bright Sky Plus" project, which proposed 49 preventive measures in four perspectives to strictly control its own sources of air pollution.

• Stationary pollution sources: the main policy involves control of sources, implementation of the regulations, and reduction of pollution, which amounts to 11 measures.

• Mobile pollution sources: the main policy involves replacement of old scooters, improvement of diesel car emissions, promotion of low pollution vehicles and clean fuels, and control of vehicles in use, which amounts to 19 measures.

• Fugitive pollution sources: the main policy involves control of construction projects, control of dust emission from bare ground and roads, and control of livelihood issues, which amounts to 15 measures.

• Integrated management: the main policy involves implementation of the Bright Sky project, education and protection of poor air quality, environmental education project of air quality, and promotion of green life and planting, which amounts to 4 measures

Since the City started promoting the Bright Sky project and implementing air pollution control, it has currently achieved the target of Phase I (2015-2019), that is, reducing the number of days with PM2.5 reaching red alert (PM2.5≧54μg/m3) by 50% in five years. The actual result was a 76% decrease, showing that the implementation had worked well. In order to continuously control the pollution and refine the measures, the City put forward Phase II, "Bright Sky Plus", which aimed to control the sources of pollution, reduce air pollutant emissions, and achieve the goal of having 82% of days of blue sky (AQI≦100) by 2030. Through the integrated promotion and division of labor among the City's departments/bureaus, we will expand the control of the sources of air pollution and continue to faithfully maintain air quality and control pollution, making each day's air quality in Tainan City better than the day before.

Clean Soil and Water, Our Green Hometown

The thriving economic development has brought about a wide variety of environmental pollutants. The soil and groundwater are the final receptors in the environment, and where the pollutants accumulate. Tainan City Government has been paying great attention to the improvement of soil and groundwater quality for years. Therefore, the City' s improvement and promotion team of soil and groundwater polluted sites was established to recruit experts and scholars to strictly review the improvement progress and results, and at the same time firmly supervise the polluter or the related party' s pollution remediation to ensure that the target of remediation is achieved.

The City' s soil and water mascots, Dr. Duck and Zhi.

Self-monitoring of Groundwater in Industrial Zone

To restore the normal usage of the polluted sites, in the 74 polluted sites put on the watch list in 2019 (reference year), 26 of them are under remediation by polluters and 48 are stagnant sites. For the sites under remediation, the City manages them by means of strict supervision and friendly guidance. For the stagnant sites, in addition to actively pursuing the polluters, the City also negotiates with the concerned parties of the polluted land to carry out improvement operations. At the same time, the City will look for budgets for executing appropriate improvement measures. The goal is to reduce the number of polluted sites by 50% by 2030 compared to the reference year (2019), making Tainan City a city of clean soil and water.

SDG 12 Responsible Consumption and Production

To ensure sustainable consumption and production patterns

Tainan City introduces the concept of a circular economy into consumption and production patterns, strengthens the promotion of organic agriculture and environmentally friendly farming, reduces waste, promotes recycling and reuse, and increases the value of resources, to create a sustainable, low-carbon city.

12.1 Effective reuse of building materials

Promote sustainable recycling of old materials

To promote the recycling of old building materials in Tainan, under the funding support from the Bureau of Cultural Heritage of the Ministry of Culture, in July 2017, the "Tainan City Cultural Assets and Building Materials Bank" was set up as a first effort in all of Taiwan. It has been in operation for 4 years, and the performance has been progressive. By July 2021, the number of applications for the reuse of building materials had risen to 3,102 cases.

The building materials bank was established to organize the tidying up of historical sites, historical building restoration sites, scrapped and demolished public buildings, private donations, etc., so that the old materials could be reused, and gradually practice the organized storage management of antiquated materials with a target towards reuse. Through the establishment of the nation's first systematic management mechanism, the reuse rate of building materials through applications and diversification in the use of building materials can be improved upon: the education and promotion of recycling used materials, the consultation and counseling of matching and reusing materials, and other strategies to achieve recycling of used materials at all levels, and broaden promotion to the public regarding treasuring resources, and low-carbon environmentalism.

Besides offering guidance on the management of old materials towards a comprehensive organization, promotion has been actively made to the general public and the community using a creative and value-adding mindset for building materials recycling combined with traditional techniques so to implement and improve on the concept and level of cultural heritage preservation. The long-term outlook is to collect 15,000 old materials by 2030.

"Come to Tainan to Discover Sugar Art" Creative Collaboration Project between Madou Junior High School and Artist Wang Rui-heng

Restoration for the Original Auditorium and Clock Tower Base of the Yanshui Huanya Elementary School: Restoration work for 88 Sash Glass Windows in the Auditorium

12.2 Promotion of Organic Farming

Promotion of organic and environmentally friendly farming

Faced with a fragmented farming scenario that has contributed to farming-related pollution, ensuring consumers can eat safely and that our farm produce is healthful is an issue that the City needs to address actively. Organic and environmentally friendly farming adhere to the principles of sustainable utilization of natural resources, and in so doing helps to achieve the production and provision of green, natural, safe and healthful agricultural products for consumers to choose. This is in line with the policy of ecological greenery and environmental protection.

Tainan's largest official organic farmland - Shi-Sheng Organic Farm

12.3 Promotion of green procurement

Organize green procurement operation training courses and publicity periodically

It has currently become a prevailing trend for governments to initiate green procurement operations and promote green consumption in their own countries. The procurement personnel of the administration in government agencies and schools conduct regular training courses on green procurement operations with a minimum of twice per year to enhance the procurement personnel's knowledge of environmentally friendly products, understand the current status and development of green procurement within Taiwan and abroad, and guide the purchasing process of green procurement and the operation of the declaration system for all purchasers. Promotion has been made through publicity, such as labels to raise visibility and educational materials during school activities, and festivals, so that citizens and procurement personnel can be encouraged to purchase green products where available, thereby raising their overall awareness.

Guidance to enterprises in the handling of green procurement

To encourage enterprises to start green purchasing from the beginning of their production line and give priority to using environmentally friendly products, special personnel have counselled enterprises about formulating green procurement plans, and to commend excellent green procurement manufacturers with funding of over NT$5 million. Such initiatives were expected to boost the engagement of companies and groups in green procurement. In 2020, a total of 331 private enterprises and organizations joined the ranks of green procurement, and the amount of green procurement totaled to over NT$7.1 billion.

Briefing Session on Green Procurement for Private Enterprises and Groups in Tainan City

12.4 Increase the recycling rate of business waste

Waste reduction from the source

In 2020, the City took steps to reduce the amount of solvents with top 3 waste output. Workshops had been convened on understanding the production of waste liquids and waste solutions generated by the optoelectronics industry, inviting experts to explain the relevant principles, and offered advice to industry operators in self-processing and recycling. In 2020, 5 workshops were organized by companies, including Innolux Corporation. The total monthly reduction volume reached 1,406.05 metric tons, and the overall reduction volume in 2020 was around 16,872.60 metric tons. At the end of 2020, visits to the factory of Innolux Corporation were arranged to promote relevant industry exchanges and understanding of the source of business waste reduction.

Visiting Innolux Corporation

SDG 13 Climate Action

Take urgent action to combat climate change and its impacts

Efforts are being made to reduce the damage caused by climate change and natural disasters to the environment, strengthen Tainan's adaptability and resilience in response to disasters, and to minimize the impact of disasters. At the same time, the City's ability and speed in post-disaster recovery have been boosted.

13.1 Working together to mitigate and adapt

Adaptation plan for climate change

Adaption to climate change has become a global trend. In order to cope with climate change, the City Government has selected relevant information on climate change adaptation here and abroad according to the planning and decision-making of various bureaus, professional planning teams and meeting platforms. Based on the suggestions of experts and scholars, the concept of the "Resilient City" has been chosen as the City's vision, and the City's spatial characteristics and climate change vulnerability have been evaluated in accordance with Taiwan's "National Climate Change Adaptation Policy Guidelines" and "Local Climate Change Adaptation Plan Planning and Operational Guidelines" to develop and formulate the City's policies and the organizations working towards climate change adaptation.

The first version of the Climate Change Adaptation Plan was raised in 2015. With the inter-office meetings in 2019, negotiations and integrated work meetings in 2020, the Tainan City Climate Change Adaptation Plan 2020 (Revised Edition) was completed, with a coverage of the 8 major areas (multi-disciplinary, disasters, water resources, coastal areas, land use, agricultural production and biodiversity, energy supply and industry, and health), reaching 53 adaptation action plans in total; these will be on continuous rolling reviews throughout the implementation and promotion of adaptation plans. It is hoped that the City' s strength against future traumas and pressures can be built upon the basis of its socio-economic, technical and infrastructure, and so on to secure Tainan as a resilient city.

Tainan City's Climate Change Adaptation Plan in Detail
53 Adaptation Action Plans

Multi-disciplines (8 sections)	• Mountain supervision for disaster prevention and wild creeks governing management program • Rivers and regional drainage improvement program • Agricultural engineering and road improvement program • Low-carbon sustainable home construction work • The Clear and Bright Sky Project
Disasters (14 sections)	• Disaster prevention and rescue cultivation program • Disaster management education program for schools • United Nations International Strategy for Disaster Reduction (UNISDR): Making Cities Resilient Campaign • COVID-19 pandemic prevention program
Water resources (5 sections)	• Reclaimed water plants demonstration program • Scientific audit of water pollution • Livestock wastewater recycling program
Coastline (1 section)	• Sandbar conservation project for beaches in coastal areas
Land use (3 sections)	• Tainan City's territorial program • Review for Tainan City's urban design • Delineation of hillside areas and review of development
Agricultural Production & Biodiversity (9 sections)	• Important national wetland conservation • Biodiversity conservation and invasive species management • Strengthening on pest prevention measures • Control management for infectious diseases from animals
Energy Supply and Industries (8 sections)	• Solar City Project's subsidy program • Energy saving and carbon reduction program for Tainan low-carbon city and livestock farms
Health (5 sections)	• Chronic disease caring network program • Vector-borne diseases prevention program • Air quality management program

Tainan City's Climate Change Adaptation Plan

13.2 Strengthening disaster contingency planning

Improve drainage efficiency rate

To enhance and improve the City's regional drainage and flood discharge functions and achieve the purpose of reducing losses due to flooding, the flood control effect is improved through comprehensive flood control projects and resilient flood control measures. With the goal of good water drainage for a 10-year period, and flood-proof watercourses over a 25-year period, a comprehensive water control strategy has been adopted in densely populated areas or major construction areas, and the concerned areas as announced by Article 163, with a total of 623 kilometers and the original flood control functions in small and medium-sized drains will be maintained. By 2030, the improvement for regional drainage is expected to increase by over 40%, thereby enhancing local economic development, effectively ensuring the safety of people's lives and property, and improving the quality of living.

The City's successive funds investment in water control, tested in the several heavy rainfall during 2021, have shown outstanding results in several flood-prone areas that had often been criticized in the past, such as Chung Hwa University of Medical Technology in Rende District, Kun Shan University in Yongkang District and the area of Xiwanli community, Anzhong Road and Tong'an Road in Annan District, Lanhuayuan District in Houbi District, Jiuduzitou community and Beima community in Beimen District, and Xichangliao in Jiangjun District. Besides an absence of obvious flooding, residents in these areas have also expressed unanimous affirmation, showing that various renovation and contingency projects conducted in the past few years have been effective.

Sucuo Flood Detention Pond - the largest flood detention pond in Tainan

Roving vehicle for landslide observation

Liuying District Office Evacuation Shelter - opening and evacuation drills

Establishing awareness regarding disaster prevention

In recent years, the frequency and scale of disasters have increased due to global climate change, so that disaster prevention is even more important than disaster relief. For predictable disasters, preventive evacuation is an important disaster prevention strategy. Evacuation-related lectures and drills are conducted to build up residents and communities' awareness, thereby reducing damage to life and property, and controlling social anxiety when disaster strikes.

Focusing on 16 villages in 7 administrative districts of the City with potential for landslides, areas with low awareness but high-potential landslides have been identified for setting up autonomous disaster prevention communities. Military simulations and practice drills have been organized, with 7 simulations and 2 practice drills held annually. The goal is to stage a total of 90 evacuation publicity activities for residents by 2030, with the aims to strengthen the operation of autonomous disaster prevention communities, achieve a disaster avoidance and disaster reduction operation mechanism, and reduce the loss of life and property in the community.

In order to strengthen the citizens' disaster prevention self-awareness, self-rescue and mutual rescue capabilities, strengthen the knowledge and improvement of the disaster prevention and rescue operation procedures of the front-line personnel, each district office will conduct evacuation lectures, education trainings or annual drills. The goal is to organize 218 related activities by 2030, with a total of 36,000 participant times.

13.3

Sustainability of the environment through extensive education

Promotion of sustainable campus project

In an effort to establish a forward, safe, hygienic, healthy, and welcoming learning environment, it is essential to integrate a sense of community awareness, establish community identity, and explore eco-tourism so to transform the campus environment into a public activity space with community characteristics. Combined with green technology implementation and application, as well as application of the nation's industrial technology, it is hoped that the promotion of green industries will be further enhanced.

In order to achieve a sustainable development, the City Government has incorporated the Ministry of Education's Subsidized Sustainable Circulation Campus Exploration and Demonstration Program to create a quality outdoor education environment and foster a campus aesthetics and daily ambience that is infused with indigenous creativity. In so doing, the 12-year national fundamental education concept and ideal of "adaptive development, balanced education, lifelong learning" can be fully achieved. As of 2021, a total of 12 applications from schools have been received. More applications are encouraged, with anticipation for 3 schools per year, so that by 2025, a total of 24 schools will have benefited, and that by 2030, an accumulated total of 39 schools will have benefited under this project.

Guanmiao Junior High School adopts the belief that "Objects are attached to the ambiance, and the ambiance arises from the land". The space is injected with local humanities and arts and provides a safe environment for students with different needs to have a barrier-free campus environment. It has won four 2021 Yuan Ye Awards.

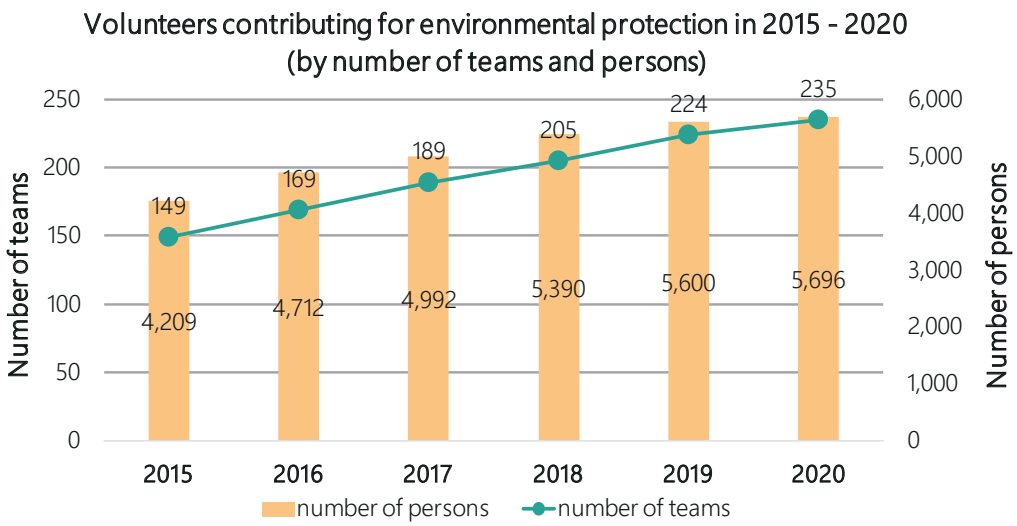
Expansion of the volunteer network for environmental protection

Environmental protection is closely related to people's daily lives. Environmental issues ranging from sanitation, cityscape, recycling of materials, air pollution, and river conservation, to global warming and climate change all affect everyone's life to a great extent. In promoting the protection and improvement of the environment, efforts coming solely from the government would render a limited scope of implementation and results. It is hoped that through the promotion of volunteering for environmental protection, more people will be driven to participate in environmental protection services, and the power of community goodwill can be developed. Public-private cooperation, multi-faceted promotion of environmental protection work, solid environmental education, and deep cultivation of the concept of care for one' s home city, the land, and the environment must go hand-in-hand. With the vision of "Building an environmentally friendly community and a sustainable home city", we can make Tainan's environment healthier for all.

To promote environmental protection, work within communities, anchor environmental education in the community, implement the Volunteer Service Act, and assist volunteers to obtain the relevant service records, trainings are being conducted. Besides, guidance is offered to support the establishment of volunteer teams, and annual environmental volunteer training is being organized. By end of 2020, there were already a total of 235 volunteer teams and 5,696 individual volunteers. The goal is to increase the total number of environmental volunteers to 6,600 by 2030. In the future, it is hoped that through training, service awards, recognition and publicity of service accomplishments, more elderly will become volunteers for environmental protection, and rapport can be established among the middle and senior age groups so to protect their home city together and create a high-quality and sustainable community that values environmental protection.

2021 Golden Coast Fall Season Beach Cleanup

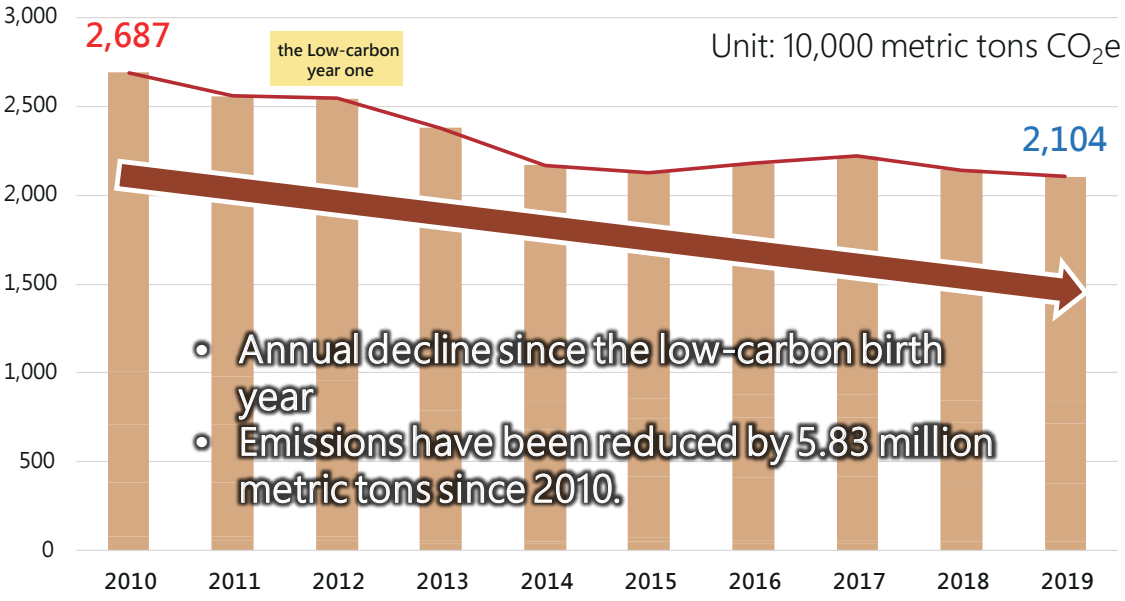
90-year-old Grandma Shih Huan, Tainan Mayor' s commended O~young volunteer contributing in environmental protection



13.4 Greenhouse gas reduction

Formulation of a carbon reduction path towards focused objectives

Tainan is committed to developing itself as a low-carbon city. In 2012, Tainan was the first municipality in Taiwan to have low-carbon regulatory officiation through the announcement of the "Tainan City Self-Government Ordinance for a Low-Carbon City". By Article 15 of the "Greenhouse Gas Reduction and Management Act" and Article 14 of the same Ordinance's Enforcement Rules, the implementation plan for Tainan City's greenhouse gas control was formulated, at the same time producing the carbon reduction goals and roadmaps. The current goal is to reduce greenhouse gas emissions by 20% in 2030 against the 2005 baseline.



Phase 1 Framework of the implementation plan for greenhouse gas control

In accordance with Article 15 of the "Greenhouse Gas Reduction and Management Act" and Article 14 of the same Ordinance's Enforcement Rules, the first phase of Tainan City's implementation plan for greenhouse gas control was developed to strive for the vision of "Low-carbon Tainan, Good for Living and Sightseeing"; 6 key areas, 6 main goals, 20 promotion strategies, and 30 key indicators have been developed; 14 bureaus work together on 125 promotion practices, and continue efforts in reducing the City's greenhouses gases.

6 main goals with impressive achievements

The Energy Department reached the standard one year ahead of schedule. In 2020, the city's solar photovoltaic installation capacity reached 2.0 GW, attaining, and surpassing the expected 1GW target set for 2021 ahead of schedule. The Manufacturing Department promotes energy transformation; the current proportion of fuel and coal-fired emissions only accounts for 1.8%. In terms of improvements in public transportation, the Transportation Department reported on the progressive increase in public transportation trips, reaching 23.68 million passenger trips in 2019. For Residential and Commercial Department, there has also been energy savings of 1% in the residential and commercial areas comparing 2020 with 2016 baseline, and 4.7% savings in the public sector. The Agricultural Department promotes friendly agriculture and is committed to raising the area of organic farmland, reaching 700 hectares in 2020. The Environmental Department protects the environment with a better sewage treatment rate at 51.68% in 2020, and is on its way towards further increment.

Effective and remarkable carbon reduction work

The City's greenhouse gas emissions have been decreasing since 2010. The total greenhouse gas emissions in 2019 was 21.04 million tons of CO2e, which was reduced by 5.83 million tons compared with 26.87 million tons of CO2e emissions in 2010, indicating that the various reduction strategies have achieved practical results.

▼ Mayor Huang signed the "Tainan City Climate Emergency Declaration"

SDG 17 Partnership for the goals

Take emergency measures to address climate change and the associating impacts

Currently, global carbon dioxide emissions are increasing, aggravating the greenhouse effect. Taiwan is also a part of the global village and cannot avoid the impact of climate change. The issue of climate change is a global challenge. In the face of the challenge of climate change, Tainan City cannot detach itself from the issue nor fight it alone. The situation needs to be effectively dealt with through substantive cooperation between different departments and bureaus and compliance with international standards.

17.1 Low-carbon Adaptation and Sustainable Development Committee

Fully empowered to promote substantive cooperation between departments and bureaus

To effectively mitigate, cope with and adapt to the impact of climate change, and aim to build a healthy, happy and prosperous low-carbon city that is on a par with international standards for Tainan' s citizens, the City Government drafted the "Tainan City Self-Government Ordinance for a Low-carbon City" in June 2011, which was subsequently passed after three readings in Tainan City Council, approved by the Executive Yuan, and promulgated for its implementation based on the Order Fu-Fa-Gui-Zi No. 1011084760A on Dec. 22, 2012, making Tainan City the first special municipality in Taiwan to adopt the low-carbon city as its governance standard. According to Paragraph 2 of Article 3 in the "Tainan City Self-Government Ordinance for a Low-carbon City", "Tainan City Low-carbon Adaptation and Sustainable Development Committee" is established to promote and implement the low-carbon-related tasks. Currently, the Tainan City Low-carbon Adaptation and Sustainable Development Committee is holding at least one meeting a year in Tainan.

The Tainan City Low-carbon Adaptation and Sustainable Development Committee has met to review the formulation of various low-carbon strategies on a rolling basis and evaluate the implementation status of various low-carbon adaptation and sustainable development matters.

Cooperation between industries, government and academia to promote the City's climate change policy

The Low-carbon Adaptation and Sustainable Development Committee consists of scholars and experts, environmental protection organizations, non-profit organizations, government agencies, low-carbon industries, and representatives of the City Government. Scholars and experts selected and appointed by the Mayor work together with representatives from environmental protection organizations, non-profit organizations, government agencies, low-carbon industries, and representatives of the City Governments serving as committee members to carry out the following tasks:

- Planning for Tainan's low-carbon city promotion strategies, including renewable energy, energy conservation, low-carbon buildings, low-carbon transportation, resources recycling, environmental greening, low-carbon campuses, and low-carbon living.
- Executing the Tainan Low-carbon City Promotion Plan and organize comprehensive promotion of Tainan's low-carbon city strategies and measures through publicity and education, incentives and subsidies, demonstration plans and policy guidance.
- Compiling and organization of information and data regarding the effects and overall status of Tainan City's greenhouse gas reduction action plan, setting specific carbon reduction indicators and reviewing them regularly, and publishing the results on the Internet to help achieve the goals of a low-carbon city.

17.2

Public-Private Partnership Proposal

Participatory budgeting by the public

In the face of the risk of future extreme weather, encouraging citizens to jointly figure out an adaptation plan for climate change that is suitable for the community to apply in daily life, and the ways to strengthen residents' social connection and the adaptation mode of local economy and culture through village and community residents' actual participation and discussion, in combination with low-carbon, sustainable hometown and climate change adaptation action issues, encouraging communities to put forward local action plans in a bottom-up manner for urban greening, cooling, heat insulation, ventilation, flood control, and drought resistance, so that the City can achieve its goals of low-carbon sustainability and flood control and disaster prevention.

The selected proposal from the North District' s Revitalizing Community Development Association - Self-generating Green Power Sunny Car

Enthusiastic proposal from the public, breaking the record of the National Development Council's “join” platform

Since 2018, the City has been conducting participatory budgeting for 4 consecutive years. The community made proposals based on local features, highlighting the sustainable home city plan, improving its feasibility and local adaptability, and allowing the community members to participate in the project with knowledge of how the budget is spent. Since 2018, 38 communities in 14 administrative districts have put forward 49 proposals. After deliberation by Tainan’ s citizens, 29 proposals on community transformation have been selected for subsidies. In 2019, the City asked its citizens to vote via the National Development Council's “join” platform. There were 25,000 person-times taking part in the voting, which was a record high since the National Development Council created the “join” platform. The future goal is to encourage more communities to participate and put forward proposals so that the homeland can be made sustainable in all aspects and dimensions.

Participatory Budgeting - Proposal Workshop

17.3

Raising the international visibility and recognition of Tainan

Tainan City: Our Low-carbon City Network

The City built "Tainan City: Our Low-carbon City Network" platform mainly to update the status of promoting energy conservation and carbon reduction in the Greater Tainan area through a "simple, easy, sharable and living" knowledge exchange platform, and compile and organize the data, information, documents, activities, etc., related to low-carbon sustainability in a planned manner, which will become a solid foundation for subsequent popularization and promotions.

To promote the construction of a "Low-carbon Sustainable Home City", besides updating with the latest news, an electronic quarterly magazine is also published every quarter in "Tainan City's Low-carbon City Network". It delivers updated domestic and foreign information related to energy conservation and carbon reduction. In addition, the quarterly e-newsletter also introduces the current situation of low-carbon development in Tainan to the public, so that they understand the latest measures of the Tainan City Government in energy conservation and carbon reduction, and the latest achievements in the implementation of the "Low-carbon Sustainable Home City". Through the English version' s publication, Tainan is able to communicate directly with the international community. Should there be an intention to cooperate or communicate at the international level, direct contact with the City's low-carbon policy team can be made through this platform to strengthen Tainan City's channels of international cooperation.

Tainan City: Our Low-carbon City Network

The Global Covenant of Mayors for Climate & Energy

After participating in the ICLEI World Congress in April 2015, in order to demonstrate its determination to build a low-carbon city, the Tainan City Government completed various audits successively, including the City's urban greenhouse gas inventory, proposal on the City' s GHG reduction goals, and the schedule of achieving the GHG reduction goals. The Global Covenant of Mayors for Climate & Energy notified Tainan City of it passing the review in October, 2015. Tainan City became the official member of the Covenant when receiving the badge and the notification letter from the ICLEI.

ISO 37120 Platinum Certification

Tainan City joined the World Council on City Data (WCCD) in 2017 and participated in the ISO 37120 indicator system certification according to the international standard city indicator system. On November 14, 2017, Tainan City received a notification letter from the WCCD that all the City' s indicators have been certified and obtained the highest level "Platinum Certification".

CDP certified A-list city

In 2019, Tainan City began to fully disclose urban carbon information on the CDP platform and was graded A in the same year (2019). Among the 850 cities throughout the world, only 105 of them received A listing. It shows that Tainan's efforts in combating climate change has been recognized and can be proudly shared with other cities around the world.

In 2020, on top of receiving the CDP' s A listing again, Tainan City also won the "Full Compliance" badge from the "Global Covenant of Mayors for Climate & Energy" during the A listing review with shared application information between CDP and the Covenant.


臺南市美術館
TAINAN ART MUSEUM
2館
BLDG

V. Future Outlook

攝影：翁宗憲

Tainan City’ s voluntary inspection report focused on 10 prioritized promotion goals this year, and matched the sub-targets of Taiwan's sustainable development goals with the City's various indicators to serve as the basis for subsequent tracking and inspection, thus ensuring the correctness of various promotion measures. At the same time, the City submitted the report to the international platform for open publication, joining in the effort for the global sustainable development. Tainan City Government will continue to update and submit voluntary inspection reports on a regular basis. Through yearly refinement and revision, the City will synchronously integrate the economic, social, and environmental policy actions, initiate new thinking, and action models, and adjust the City's strategies and actions, enabling Tainan to continue progressing, fulfilling its obligations as a global citizen, and moving steadily towards the goal of a sustainable, livable city.

攝影：翁宗憲

Appendix 1

攝影：翁宗憲

SDG3
Ensure healthy lives and promote well-being for all at all ages

Indicator	2020	2030
Number of the confirmed cases of dengue fever (person-times)	7	<100
Computation: From 2016 to 2020, the average number of confirmed local cases remained lower than 100; however, the number of confirmed cases in that year shall prevail.		
Proportion of the elders receiving PPV (%)	51.06	65
Computation: number of people vaccinated /number of people who should be vaccinated * 100%		
Proportion of young children receiving all routine vaccines (%)	86	>95
Computation: number of 3-year-old children who have completed all routine vaccine doses before they are 36 months old/number of all 3-year-old children in Tainan City		

SDG4
Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

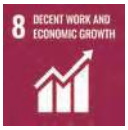
Indicator	2020	2030
Proportion of residents serving as volunteers (persons)	52,036	55,000
Computation: summation of report data		
Supply ratio of institutions offering preschool childcare services (%)	93.3	99.5
Computation: Total approved enrollment divided by the number of children aged 2-5 in the City		
The City's participation rate in lifelong learning (%)	11.84	13
Computation: Survey of the City Government' s various adult learning channels		
Percentage of students placed in schools with special education resources or related special education services (%)	95	99
Computation:		
Level of satisfaction regarding the improvement funding for a barrier-free school environment (%)	91.49	97
Computation: Based on public information from the Environmental Protection Administration website		
Facilities and sites for environmental education reaching 25 locations by 2030	14	25
Computation:		
Obtaining one low-carbon campus certification mark (school times)	293	280
Computation: Based on the number of schools certified		

SDG6
Ensure availability and sustainable management of water and sanitation for all

Indicator	2020	2030
Sewage treatment rate (%)	51.68	65%
Computation: total number of sewage treatment households × household size/total population		
Number and penetration rate of public sewage and sewers (30%)	22.24	30
Computation: According to the statistics of the Water Resources Agency, MOEA		
Water consumption per capita (liters/person)	279	250
Computation: According to the statistics of the Water Resources Agency, MOEA		
Volume of reclaimed water (ton/day)	0	5,000
Computation: Actual measurement on the volume of water supply		
Number of water resources protection volunteer team	42	45
Computation: Project reports		
Sections of major rivers without serious pollution (%)	Jishui River 15.7 Yanshui River 5.7 Erren River 24.1	Jishui River 0 Yanhui River 0 Erren River 0
Computation: Monitoring data of water quality		

SDG7
Ensure access to affordable, reliable, sustainable, and modern energy for all

Indicator	2020	2030
The installed capacity of photovoltaic systems (GW)	2.0	4.5
Computation: total number of sewage treatment households × household size/total population		
Adding solar communities (locations)	60	100
Computation: Number of households connected to public sewage and sewers × household size/total population		
Annual electricity generated from the thermal energy of incineration (million watts/hour)	248,218	250,000
Computation: According to the statistics of the Water Resources Agency, MOEA		
Annual power generation from landfill planting (10,000 kWh/year)	1,900	2,100
Computation: Actual measurement on the volume of water supply		
Guidance on the reuse of biogas in ranches (%)	24	40
Computation: Project reports		



SDG8

Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all

Indicator	2020	2030
Advocacy of heat hazard prevention for business units (activity times)	111	240
Computation: number of incidents receiving guidance		
Outdoor high temperature and heat hazard prevention inspections (times)	185	220
Computation:		
Number of local SBIR approved and total project amount (number of cases, NT$100 million)	780 cases, NT$1.57687 billion	1200 cases, NT$2.5 billion
Computation: Data filled in the effectiveness tracking form by the manufacturers		
Tainan Industrial Park Development Plan handling (annual output value, billion)	Currently, the annual output value of the Liuying Technology Industrial Park, Tree Valley Park, Sinji Industrial Park, and Yongkang Technology Industrial Park have increased by NT$230.9 billion	The annual output value of green energy and Qigu development plan to increase by NT$50.5 billion
Computation: self-development by the City Government		

SDG9

Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation

Indicator	2020	2030
Promote users with an electricity contract capacity of more than 800 kw to set up photovoltaic systems (million watts)	150	160
Computation:		
Small and medium enterprises' credit guarantee loan, approved loan amount	NT$84.95 million	NT$150 million
Computation: Statement as provided by Small and Medium Enterprise Credit Guarantee Fund of Taiwan		

SDG11

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

Indicator	2020	2030
Increase in park area (hectares)	628.65	638.65
Computation: cumulative park area		
Number of trees planted in the year per 100,000 persons (trees)	21,459	20,943
Computation: (Public Works Bureau, Agricultural Bureau's cumulative number of trees planted in the current year) / the City's population * 100,000		
Increase the passenger capacity of the City's mass transportation vehicles	Decrease by 12.1%	Increase by 25%
Computation: the passenger capacity of the City's buses		
Taiwan Tourist Shuttle service passenger rides (10,000 person times)	21	28
Computation: passenger capacity of the City's sightseeing buses (annual value)		
Achieved the pilot operation of self-driving cars in open fields	800 person times	According to the approved plan
Computation: number of passengers		
T-Bike public bicycle usage person times (million person times)	307	703
Computation: the City's public bicycle usage		
Service area of shared green vehicles (km2)	55	65
Computation: Shared vehicle operation and vehicle placement area		
New afforestation area (hectares)	2	10
Computation: Shared vehicle operation and vehicle placement area		
Buses going fully electric (%)	4.49	100
Computation: agency statistics		
Ratio of days with air quality index (AQI) < 100 to total number of days (%)	84	85
Computation: % of days with good air quality + % of days with ordinary air quality		
Percentage reduction in soil and groundwater polluted sites (%)	9.5%	50%
Computation: The average reduction rate of sites in the past three years is 4%, estimated by the cumulative reduction rate each year		
Number of sites with community environmental transformation (locations)	43	293
Computation: agency statistics		

SDG12
Ensure sustainable consumption and production patterns

Indicator	2020	2030
Increase in environmental and ecological awareness, number of sites with community space beautifying (locations)	14	160
Computation: number of cases receiving guidance		
Building materials bank (pieces)	12,500	15,000
Computation:		
Promotion of organic (friendly) agriculture (hectares)	675	750
Computation:		
Ratio of green procurement for items designated by government agencies (%)	100	100
Computation: According to the annual assessment method of the Environmental Protection Administration, Executive Yuan		
General waste recycling rate in this city (%)	62.22	66
Computation: data formula		
Business waste recycling rate (%)	65.63	70
Computation: recycling rate of business waste = amount of recyclable business waste ÷ total amount of business waste		

SDG13
Take urgent action to combat climate change and its impacts

Indicator	2020	2030
Formulate climate scenarios, improve climate risk assessment mechanisms, implement the promotion of adaptation plans, and build a resilient city	Completed the revision of the Tainan City Climate Change Adaptation Plan (2020 Revised Version)	Formulate climate scenarios, improve climate risk assessment mechanisms, implement the promotion of adaptation plans, and build a resilient city
Computation: Assessment based on the actual implementation of business methods of various departments and bureaus		
Regional drainage rectification and management rate (%)	24	40
Computation:		
Organize landslide evacuation promotion and drills, and promote independent disaster prevention communities in case of landslides (sessions)	27	117
Computation: Accumulation of the annual fixed number of sessions		
Assist various district offices in organizing evacuation workshops, education training or drills (person times, sessions)	208 sessions 35517 person times	up to 218 sessions 36,500 person times
Computation: approximately increase 1 session per year, 50 persons per session		

Indicator	2020	2030
Promotion of sustainable campus project (number of schools)	8	39
Computation: assist in the application and implementation of the City's sustainable recycling campus projects		
Total number of environmental volunteers (person times)	5,696	6,600
Computation:		
Greenhouse gas reduction (%)	Under inventory	20
Computation: Based on disclosed information of various ministries and councils		

SDG17

Take urgent action to combat climate change and its impacts

Indicator	2020	2030
Establish the fully empowered designated organization to promote substantive cooperation across departments and bureaus	1 meeting was held for the Low-carbon Adaptation and Sustainable Development Committee	Establish the fully empowered designated organization to promote substantive cooperation across departments and bureaus
Computation:		
Strengthen public-private cooperation and make use of community forces to drive sustainability plans in the public sectors	On September 14-15, 2020, 2 sessions of community climate adaptation vision workshops were held, while on October 21-22, 2020, 2 sessions of community climate adaptation proposal workshops were held. The implementation of 7 proposals was completed.	Strengthen public-private cooperation and make use of community forces to drive sustainability plans in the public sectors
Computation: Evaluation based on meeting minutes		
Strengthen the City’ s channels of participating in international cooperation and establish an open cooperation platform	1. On September 10, 2020, carried out the signing ceremony of the Memorandum of Understanding for "the European Chamber of Commerce Taiwan-National Cheng Kung University-Shalun Smart Industry Innovation Alliance” cum Low-carbon City Seminar" 2. Participated in the 2020 ICELI Daring Cities Online Conference from October 7 to October 28, 2020 3. On October 29, 2020, in the online meeting of "Green Climate Fund 2020 International Climate Finance and Industry Conference" held in Incheon, South Korea, the City gave a presentation on the conversion of the waste into renewable energy and usable resources in Tainan City 4. Completed the 2020 CDP report and receive an official notification on November 3, 2020 that the City was rated “A”	Strengthen the City’s channels of participating in international cooperation and establish an open cooperation platform
Computation: meeting minutes, application documents, project reports		

Appendix 2

攝影：翁宗憲

Society Group-SDG1

Item	SDGS code and the City' s indicators	Unit	2017	2018	2019	Light
1	1.1.1.1 Average total annual income per household in Taiwan	NT$	1,231,112	1,249,031	1,274,196	Green
2	1.1.1.2 Average total annual income per household in Tainan City	NT$	1,079,199	1,086,077	1,079,174	Green
3	1.1.1.3 Percentage of those with income below average gross income (recurring income) in Tainan City	%	59	60	61	Yellow
4	1.1.1.4 Average annual recurring income per household	NT$	1,121,261	1,132,138	1,120,897	Green
5	1.1.1.5 Average annual disposable income per household	NT$	902,536	898,912	904,114	Basic
6	1.1.1.6 Population of registered low-income households	persons	20,801	20,365	18,964	Green
7	1.1.1.7 Population under 12 years of age of registered low-income households	persons	2,533	2,377	2,138	Green
8	1.1.1.8 Population 12-17 years of age of registered low-income households	persons	3,632	3,336	2,871	Green
9	.1.1.9 Population 18-64 years of age of registered low-income households	persons	12,073	11,819	10,875	Green
10	1.1.1.10 Population over 65 years of age of registered low-income households	persons	2,563	2,833	3,080	Basic
11	1.1.1.11 Population without ability to work of registered low-income households	persons	14,088	13,598	10,604	Green
12	1.2.1.1 Low-income males	persons	11,309	11,183	10,623	Green
13	1.2.1.2 Low-income females	persons	9,492	9,182	9,341	Green
14	1.2.1.3 Registered children of low-income households	persons	2,533	2,377	2,138	Green
15	1.2.1.4 Number of households with living assistance for children f rom poor families	Households	9,678	10,243	8,787	Green
16	1.2.1.5 Number of households with emergency living assistance for children from underprivileged families	Households	575	323	308	Green
17	1.2.1.6 Number of children receiving living allowance for children under special circumstances	persons	3,604	1,060	787	Green
18	1.2.2.1 Low-income households	Households / persons	9,967	10,028	9,791	Yellow
19	1.3.1.1 Percentage of persons with disabilities using home care services	%	1.18	2.24	3.02	Green
20	1.3.1.2 Ratio of people using long-term care service	%	25.0	25.5	30.1	Green
21	1.3.1.3 Number of the elderly living along receiving care services	%	1.0	0.9	0.7	Green
22	1.3.1.4 Institutional care services (registered nursing home)	Number	67	76	79	Green
23	1.3.1.5 Institutional care services (number of beds available)	number of beds	4,977	5,726	6,016	Green
24	1.3.1.6 Institutional care services (actual occupancy)	persons	3,982	4,581	5,032	Green
25	1.3.1.7 Institutional care services (number of institutions qualified)	Number	15	33	21	Green
26	1.3.1.8 Registered elderly nursing services (total number of institutions)	Number	114	115	115	Yellow
27	1.3.1.9 Registered elderly nursing services (number of beds available)	number of beds	5,490	6,014	6,057	Green
28	11.3.1.10 Registered elderly nursing services (actual occupancy)	persons	4,543	4,759	4,927	Green
29	1.3.1.11 Homeless persons	persons	184	202	220	Yellow
30	1.3.1.12 Number of homeless persons receiving placement	persons	72	68	71	Green
31	1.3.1.13 Number of ward beds per 10,000 population	number of beds	65	70	71	Green
32	1.a.2.1 Health care expenditure as a percentage of government expenditure	%	1.63	1.55	4.28	Yellow
33	1.a.2.2 Protection service expenditure as a percentage of various services expenditure	%	100	100	100	Yellow
34	11.a.2.3 Education expenditure as a percentage of government expenditure	%	34.60	33.62	32.82	Green
35	1.a.2.4 Proportional of social welfare expenditure	%	0.11	0.13	0.14	Yellow

Society Group-SDG2

Item	SDGS code and the City' s indicators	Unit	2017	2018	2019	Light
1	2.2.1.1 Reporting rate of developmentally delayed children under 5 years of age	%	10.15	11.00	13.46	Yellow
2	2.2.1.2 Diagnosis rate of developmentally delayed children under 5 years of age	%	68.31	71.00	68.42	Green
3	2.2.2.1 Overweight and obesity rates among junior high school students	%	30.89	31.83	32.52	Red
4	2.2.2.3 Fishery output value	NT$1,000	8,707,324	8,086,216	8,123,006	Yellow
5	2.2.2.4 Animal husbandry output value	NT$1,000	19,426,509	20,731,201	19,615,087	Yellow
6	2.2.2.5 Organic and eco-friendly farming	Hectares	437	497	665	Green
7	2.a.1.1 Agricultural expenditure as a percentage of total government budget	%	4.45	3.81	3.66	Yellow
8	2.a.1.2 Agricultural expenditure as a percentage of government expenditure	%	4.31	4.17	3.61	Yellow

Society Group-SDG4

Item	SDGS code and the City' s indicators	Unit	2017	2018	2019	Light
1	4.1.1.1 Percentage of elementary school graduates receiving a diploma	%	100	100	99.99	Yellow
2	4.1.1.2 Percentage of the third-grade junior high school students who take part in the Comprehensive Assessment Program and receive B or higher grade in Chinese Language	%	84.98	85.26	85.82	Green
3	4.1.1.3 Percentage of the third-grade junior high school students who take part in the Comprehensive Assessment Program and receive B or higher grade in Mathematics	%	71.29	72.34	72.37	Green
4	4.2.2.1 Number of institutions that can take care of preschool children	Number	551	557	560	Green
5	4.2.2.2 Number of children that preschool institutions can accommodate	Number	57,391	60,040	60,693	Green
6	4.2.2.3 Number of preschool children in preschool institutions	Number	47,024	48,946	50,135	Green
7	4.3.1.1 The enrollment rate of students reaching 6 years of age and registered in the City on September 1 of the current year	%	97.57	97.45	99.13	Yellow
8	4.3.1.2 Junior high school enrollment rate of those just graduating from elementary schools and registered in the City in the current year	%	103.04	100.44	102.52	Yellow
9	4.3.1.3 Senior high school enrollment rate	%	86.44	86.87	Statistics not yet completed	Yellow
10	4.3.1.4 Percentage of the unemployed attending pre-employment training courses	%	1,046	885	979	Green
11	4.3.1.5 Post-training employment rate of the unemployed (employment)	%	77	81	81.71	Green
12	4.3.1.7 Number of participants in the Citizen School	persons	3,119	4,300	5,804	Green
13	4.3.1.8 Number of participants in the City Government's lifelong learning	persons	164,674	233,064	226,930	Green
14	4.3.1.9 The City's participation rate in lifelong learning (%)	%	8.73	11.84	12.06	Green
15	4.3.1.10 Proportion of residents serving as volunteers (number of registered volunteers)	Volunteers	44,811	46,312	48,291	Green
16	4.4.1.1 Computer-based vocational training class times for the unemployed (employment)	Class times	13	13	16	Yellow
17	4.4.1.2 Percentage of senior high schools offering courses in the field of science and technology	%	100	100	100	Yellow
18	4.4.1.3 Unemployed persons participating in vocational training courses related to Information and Communication Technology (ICT) (employment)	Class times	373	327	360	Green
19	4.5.1.1 Proportion of students with disabilities placed in schools with special education resources or related special education services, according to the type and degree of disabilities of students concerned	%	97.30	98.60	98.53	Green
20	4.5.1.2 Enrolment rate of poor 5-year-old children	persons	97.62	96.95	96.38	Yellow
21	4.a.1.1 Level of satisfaction regarding the improvement funding for a barrier-free school environment	%	82.40	100	91.06	Green
22	4.a.1.2 Level of satisfaction regarding improvement funding for school toilet environment	%	58.52	98.36	85.54	Green

Society Group-SDG5

Item	SDGS code and the City' s indicators	Unit	2017	2018	2019	Light
1	5.2.1.1 Adolescents under 18 years of age who have been subjected to unlawful physical, sexual, or mental abuse by an existing or former intimate partner	%	0.023	0.062	0.004	Yellow
2	5.2.1.2 Number of persons subjected to sexual assault, per 100,000 persons	persons	12.6	11	11.96	Green
3	5.3.1.1 Marriage rate of women 20-24 years of age, per 100 women	%	3.54	4.22	4.23	Green
4	5.3.1.2 Marriage rate of women 15-19 years of age, per 100 women	%	0.22	0.31	0.30	Green
5	5.3.1.3 Marriage rate of women under 15 years of age, per 100 women	%	0	0	0	Yellow
6	5.5.2.1 Proportion of female City Government workers	%	54.74	54.70	55.02	Yellow
7	5.5.2.2 Women elected to agencies representing members of the public	%	40.35	40.35	40.35	Yellow
8	5.5.2.3 Proportion of women who are the head of a first-level unit and the head of a first-level agency to which they belong	%	23.08	15.38	23.08	Yellow
9	5.5.2.4 Proportion of female police officers	persons	11.97	11.40	10.85	Yellow

Society Group-SDG16

Item	SDGS code and the City' s indicators	Unit	2017	2018	2019	Light
1	16.1.1.1 Number of violent crime occurrences	Per 100,000 persons	6.52	7.9	7.6	Yellow
2	16.1.1.2 Number of violent crime cases	Per 100,000 persons	5.2	4.93	4.2	Green
3	16.1.1.3 Number of deaths caused by intentional assault per 100,000 persons	Per 100,000 persons	2.3	2.2	2.1	Yellow
4	16.1.1.4 Number of people injured per 100,000 persons	Per 100,000 persons	68	61.3	63.1	Green
5	16.1.1.5 Number of crime occurrences per 10,000 persons	Per 100,000 persons	145.14	137.51	129.89	Green
6	16.1.1.6 Clearance rate of general criminal cases	%	87.71	89.44	91.14	Green
7	16.2.1.1 Notification rate of child abuse	%	0.66	0.15	0.18	Green
8	16.2.1.2 Number of people who entered the country illegally or were subject to labor or sexual exploitation	persons	33	8	4	Green
9	16.2.1.3 Number of people under 18 years of age who have been sexually assaulted	persons	113	110	132	Green
10	16.2.1.4 Proportion of people who have been sexually harassed	persons	90	78	102	Green
11	16.5.1.1 Number of government officials convicted of corruption and bribery per 100,000 people	persons	0.212	0.106	0.159	Yellow
12	16.6.1.1 Proportion of the annual budget allocated to general administrative budget	%	19.45	18.53	18.61	Basic
13	16.6.1.2 Proportion of the annual budget allocated to education, science & technology, and culture	%	38.34	36.43	34.12	Basic
14	16.6.1.3 Proportion of the annual budget allocated to economic development	%	17.18	19.24	22.85	Basic
15	16.6.1.4 Proportion of the annual budget allocated to social welfare	%	12.53	13.98	14.26	Basic
16	16.6.1.5 Proportion of the annual budget allocated to community development and environmental protection	%	4.56	4.36	3.96	Basic
17	16.6.1.6 Proportion of the annual budget allocated to retirement and pension	%	4.59	4.29	3.71	Basic
18	16.6.1.7 Proportion of the annual budget allocated to debt	%	1.00	0.75	0.68	Basic
19	16.6.1.8 Proportion of the annual budget allocated to other items	%	2.35	2.42	1.81	Basic
20	16.9.1.1 Birth registration rate for children under 5 years of age per 100 children	%	100	100	100	Yellow

Industrial economics category-SDG8

Item	SDGS code and the City' s indicators	Unit	2017	2018	2019	Light
1	8.3.1.1 Non-agricultural (i.e., excluding agriculture, forestry, fishery and animal husbandry) male employment as a percentage of total employment	%	50.24	50.05	50.57	Yellow
2	8.3.1.2 Non-agricultural (i.e. excluding agriculture, forestry, fishery and animal husbandry) female employment as a percentage of total employment	%	42.74	42.72	42.46	Green
3	8.3.1.3 Small and medium-sized enterprises' credit guarantee loan: Approved loan amount.	NT$1,000	2,700	15,200	4,700	Green
4	8.3.1.4 Regional SBIR: Number of approved cases and the total value of the plans	number of cases,in 10 thousands NTD	71 cases 14,624	64 cases 15,066	68 cases 14,159	Green
5	8.3.1.5 Innovation and Creativity Promotion Program: number of groups of new start-up teams consulted every year, and n umber of the company/firms established with assistance	Number of groups	11 groups consulted: 6 companies/ firms established	15 groups consulted: 8 companies/ firms established	15 groups consulted: 5 companies/ firms established	Green
6	8.5.1.1 Average monthly salary calculated according to agricultural workers	NT$	28,939	29,293	30,280	Green
7	8.5.1.2 Average monthly salary calculated according to industrial workers	NT$	36,782	37,483	38,531	Green
8	8.5.1.3 Average monthly salary calculated according to service industry workers	NT$	31,052	31,768	32,769	Green
9	8.5.1.4 Average salary of workers under 19 years of age	NT$	16,525	16,871	16,931	Green
10	8.5.1.5 Average salary of workers 20-24 years of age	NT$	22,187	22,932	23,698	Green
11	8.5.1.6 Average salary of workers 25-29 years of age	NT$	29,350	30,033	30,873	Green
12	8.5.1.7 Average salary of workers 30-34 years of age	NT$	32,612	33,150	33,869	Green
13	8.5.1.8 Average salary of workers 35-39 years of age	NT$	35,305	35,836	36,468	Green
14	8.5.1.9 Average salary of workers 40-44 years of age	NT$	37,013	37,751	38,562	Green
15	8.5.1.10 Average salary of workers 45-49 years of age	NT$	36,199	37,317	38,467	Green
16	8.5.1.11 Average salary of workers 50-54 years of age	NT$	34,761	35,784	36,832	Green
17	8.5.1.12 Average salary of workers 55-59 years of age	NT$	34,940	35,402	36,125	Green
18	8.5.1.12 Average salary of workers 60-64 years of ag	NT$	35,996	36,320	36,856	Green
19	8.5.1.14 Average salary of workers who are 65 years old or older	NT$	28,462	28,664	29,267	Yellow
20	8.5.1.15 Average salary of male workers	NT$	36,135	40,843	37,912	Green
21	8.5.1.16 Average salary of female workers	NT$	28,944	31,452	30,631	Green
22	8.5.1.17 Average monthly salary calculated according to disabled workers	NT$	Statistical data unavailable	Statistical data unavailable	26873	White
23	8.5.2.1 Unemployed disabled persons	%	Statistical data unavailable	Statistical data unavailable	9.5	White
24	8.6.1.1 Unemployed males as a percentage of total labor force	%	4.2	3.9	3.6	Green
25	8.6.1.2 Unemployed females as a percentage of total labor force	%	3.4	3.6	3.9	Green
26	8.6.1.3 The unemployed 15-24 years of age as a percentage of total labor force	%	15.0	12.3	11.2	Green
27	8.6.1.4 The unemployed 25-29 years of age as a percentage of total labor force	%	6.3	6.2	6.1	Green
28	8.6.1.5 The unemployed 30-34 years of age as a percentage of total labor force	%	2.6	3.6	2.3	Green
29	8.6.1.6 The unemployed 35-39 years of age as a percentage of total labor force	%	2.8	3.0	4.6	Green
30	8.6.1.7 The unemployed 40-44 years of age as a percentage of total labor force	%	2.5	2.4	2.3	Green
31	8.6.1.8 The unemployed 45-49 years of age as a percentage of total labor force	%	2.3	3.0	2.2	Green

Item	SDGS code and the City' s indicators	Unit	2017	2018	2019	Light
32	8.6.1.9 The unemployed 50-54 years of age as a percentage of total labor force	%	1.6	2.9	3.4	Green
33	8.6.1.10 The unemployed 55-59 years of age as a percentage of total labor force	%	1.4	0.9	2.0	Green
34	8.6.1.11 The unemployed 60-64 years of age as a percentage of total labor force	%	4.7	3.1	1.8	Green
35	8.6.1.12 The unemployed 65 years of age or older as a percentage of total labor force	%	0.2	0.1	0.2	Yellow
36	8.6.1.13 The unemployment of those whose education level is junior high school or lower	%	3.2	3.7	2.6	Green
37	8.6.1.14 The unemployment of those whose education level is senior high school or vocational school	%	3.7	3.4	4.0	Green
38	8.6.1.15 The unemployment of those whose education level is college or higher	%	4.2	4.0	4.1	Green
39	8.8.1.1 Labor insurance claimed for occupational accident injury, disability and death, person times	Class times	2,224	2,197	2,169	Green

Industrial economics category - SDG9

Item	SDGS code and the City' s indicators	Unit	2017	2018	2019	Light
1	9.1.2.1 Passenger capacity of public transportation	Person time	20,580,390	20,921,328	23,680,133	Green
2	9.1.2.2 Usage of public bicycles.	Times/vehicle/day	3.37	2.67	2.14	Green
3	9.1.2.3 Passenger capacity of Tainan Airport	Person time	447,000	475,844	469,338	Green
4	9.1.2.4 Inbound and outbound passengers at Tainan Station of THSR and TRA.	Person times	27,586,538	27,808,972	28,168,149	Green
5	9.1.2.5 Available road area by each car	m^2	60,954,000	62,817,000	62,882,000	Green
6	9.1.2.6 Parking spaces	Number	105,739	115,665	128,012	Green
7	9.1.2.7 Ratio of sidewalk spaces	m^2/km^2	758.14	758.14	758.36	Yellow
8	9.2.1.1 Ratio of population within 500 meters of the City' s public transportation	%	89	89	89	Yellow
9	9.2.1.2 Sales value of manufacturing industry as a percentage of GDP and per capita	%	6.36	6.34	5.61	Green
10	9.2.2.1 Contribution by population	NT$million/ person	0.588	0.599	0.563	Green
11	9.2.2.2 Manufacturing labor employment	%	33.18	32.83	33.56	Yellow
12	9.2.2.3 Industrial development (total number of factories)	Number	9,259	9,390	9,404	Green
13	9.2.2.4 Industrial development (annual output value)	NT$1,000	1,108,684,783	1,128,293,574	1,059,142,906	Green
14	9.2.2.5 Commercial development (total number of businesses))	Number	62,874	67,043	68,823	Green
15	9.2.2.6 Commercial development (annual turnover by industry)	NT$1,000	2,296,631,517	2,400,772,339	2,355,635,718	Green
16	9.2.2.7 Commercial development (total number of businesses in Anping)	Number	2,379	2,401	2,583	Green
17	9.4.1.1 Greenhouse gas emissions per capita	Tons of CO_2e/ person	11.75	11.36	11.19	Green
18	9.c.1.1 Population coverage of 4G mobile networks	%	96.2	111.53	117.59	Green
19	9.c.1.2 Population coverage of WiFi mobile networks	%	33.45	34.26	34.62	Green

Industrial economics category - SDG10

Item	SDGS code and the City’ s indicators	Unit	2017	2018	2019	Light
1	10.1.1.1 Expenditure growth or recurring income growth per capita for bottom 40% households and total households	%	2.44	6.93	-3.89	Basic
2	10.1.1.1 Expenditure growth or recurring income growth per capita for bottom 40% households and total households	%	1.98	3.08	-0.74	Basic
3	10.1.1.1 Expenditure growth or recurring income growth per capita for bottom 40% households and total households	%	1.20	9.78	-3.94	Basic
4	10.1.1.1 Expenditure growth or recurring income growth per capita for bottom 40% households and total households	%	2.05	1.63	2.35	Basic

Industrial economics category - SDG12

Item	SDGS code and the City’ s indicators	Unit	2017	2018	2019	Light
1	12.7.1.1 Percentage of green procurement for items designated by government agencies	%	98	98	98	Yellow
2	12.a.1.1 Sinji Industrial Park wastewater discharge	CMD	Statistical data unavailable	Statistical data unavailable	7703(m^3)	-

Industrial economics category - SDG17

Item	SDGS code and the City’ s indicators	Unit	2017	2018	2019	Light
1	17.9.1.1 Aid to other countries' cities in materials or money	NT$	-	-	無	Green
2	17.16.1.1 Number of sister cities established	Number	42	43	44	Green

Environment category - SDG6

Item	SDGS code and the City’ s indicators	Unit	2017	2018	2019	Light
1	6.1.1.1 The penetration rate of tap water supply	%	99.09	99.07	99.08	Yellow
2	6.1.1.2 Drinking water inspection unqualified rate	%	0	0	0	Basic
3	6.3.1.1 Number of households and penetration rate of public sewage and sewers	%	18.32	19.03	20.34	Green
4	6.3.1.2 Overall sewage treatment rate	%	39.87	43.21	45.57	Green
5	6.3.1.3 Recycling rate of secondary treatment water discharge	%	26.7	26.7	24.0	Green
6	6.3.1.4 Business wastewater inspection rate	%	100	100	100	Yellow
7	6.3.1.5 Average concentration of biochemical oxygen demand (BOD) in five major rivers	mg/L	5.3	4.5	3.7	Green
8	6.3.1.6 Average qualified rate of heavy metals (cadmium, lead, mercury, copper, and zinc) in five major rivers	%	95.8	99.5	91.5	Green
9	6.3.1.7 Lightly and not (scarcely) polluted lengths of five major rivers	%	71.3	74.9	58.2	Green
10	6.3.1.8 Chemical substances 4 requirements management visits	Number of manufacturers	336	422	459	Green
11	6.4.2.1 Daily water consumption per person	Liters	263	265	272	Yellow
12	6.4.2.2 Irrigation water	m^3	630,772,819	522,692,223	524,942,954	Yellow
13	6.4.2.3 Water leakage	%	9.95	9.45	8.69	Green
14	6.4.2.4 Water pressure	Kg/cm^2	1~3	1~3	1~3	Yellow
15	6.4.2.4 Water pressure	Kg/cm^2	1	1	1	Yellow
16	6.5.1.1 Effective water storage capacity of Nanhua Reservoir	In 10,000 m^3	9,338.1	9,145.1	9,080.0	Basic
17	6.5.1.2 Effective storage capacity of Wushantou Reservoir	In 10,000 m^3	7,828	7,828	7,876	Yellow
18	6.5.1.3 Effective storage capacity of Baihe Reservoir	In 10,000 m^3	692	733	1,012	Yellow
19	6.b.1.1 Volunteer teams for water protection	Teams	45	42	45	Yellow
20	6.b.1.2 Public toilet inspection qualified rate	%	100	100	100	Yellow
21	6.b.1.3 Public toilets on the monitoring list	Number	3727	5145	5718	Green
22	6.b.1.4 Public toilet inspection with outstanding rating (≧95 points)	Number of cases(%)	1625(43.60)	2382(46.00)	5106(89.30)	Green
23	6.b.1.5 Public toilet inspection with excellent rating (90-94 points)	Number of cases(%)	1728 (46.36)	2265(44.00)	511(8.94)	Green
24	6.b.1.6 Public toilet inspection with average rating (85-89 points)	Number of cases(%)	374 (10.04)	498(10.00)	100(1.75)	Green
25	6.b.1.7 Public toilet inspection with unqualified rating (< 85 points)	Number of cases(%)	0 (0)	0(0)	0(0)	Green

Environment category-SDG7

Item	SDGS code and the City' s indicators	Unit	2017	2018	2019	Light
1	7.1.1.1 Proportion of households receiving electricity	%	170.96	171.92	172.80	Green
2	7.1.2.1 Electricity generated by renewable energy per capita	kWh	334.39	558.5	940.03	Green
3	7.2.1.1 Renewable energy replacement rate	%	2.38	3.98	6.54	Green

Environment category-SDG13

Item	SDGS code and the City' s indicators	Unit	2017	2018	2019	Light
1	13.1.1.1 Number of practices promoted by the City's greenhouse gas control implementation plan	Number	Not yet approved	125	125	Basic

Environment category-SDG14

Item	SDGS code and the City' s indicators	Unit	2017	2018	2019	Light
1	14.5.1.1 Area of protected coastal areas	Hectares	10,121	10,121	10,121	Yellow
2	14.5.1.2 Ecological conservation area	Hectares	823.848	823.848	823.848	Yellow

Environment category-SDG15

Item	SDGS code and the City' s indicators	Unit	2017	2018	2019	Light
1	15.1.1.1 Forest coverage rate	%	Not yet approved	Not yet approved	Not yet approved	White
2	15.2.1.1 Annual achievement rate of targeted new afforestation area	%	120.8	161.0	130.0	Green

Health category-SDG3

Item	SDGS code and the City' s indicators	Unit	2017	2018	2019	Light
1	3.1.1.1 Pregnancy deaths per 100,000 persons	Per 100,000 person	0.5	16.3	25.6	Basic
2	3.2.1.1 Mortality of children under 5 years of age per 1,000 person	‰	No data collected by county/city	No data collected by county/city	No data collected by county/city	White
3	3.2.1.2 Vaccination completion rate	%	95.29	96.45	96.86	Green
4	3.2.2.1 Mortality of infants under 4 weeks (28 days) of age per 1,000 live births	‰	1.9	2.5	1.4	White
5	3.2.2.2 Accident deaths of children under 5 years of age per 100,000 persons	Per 100,000 person	No data collected by county/city	No data collected by county/city	No data collected by county/city	White
6	3.3.1.1 New HIV infections diagnosed	persons	178	134	120	Green
7	3.3.2.1 Number of tuberculosis diagnosed	persons	863	716	672	Green
8	3.3.5.1 Dengue fever diagnosed	persons	18	22	66	Green
9	3.3.5.2 Annual average of dengue fever (DF) deaths	%	0	0	0	Green
10	3.4.1.1 Cancer deaths per 100,000 persons (only considering deaths from 4 main major cancers, liver, as well as lung cancers)	Per 100,000 person	93.1	89.9	90.3	Green
11	3.4.1.2 Diabetes deaths per 100,000 persons	Per 100,000 person	29.1	28.3	25.4	Green
12	3.4.1.3 Heart disease death rate per 100,000 persons	Per 100,000 person	45.2	45.8	41.4	Red
13	3.4.2.1 Suicidal deaths per 100,000 persons	Per 100,000 person	17.44	17.40	15.40	Yellow
14	3.4.2.2 Standardized suicide mortality	persons	12.90	12.70	11.50	Yellow
15	3.4.2.3 Prevalence of exercise among Taiwan citizens over 18 years of age	%	70.10	85.60	80.50	Green
16	3.4.2.4 Number of cumulative mental illness cases on the monitoring list of the Public Health Bureau	persons	10,326	10,125	10,145	Red
17	3.4.2.5 Cumulative number of persons receiving the mental disability handbook	persons	8,688	8,776	8,842	Basic
18	3.4.2.6 Proportion of mental illness cases referred to Level 4 by medical care	%	42.6	43.8	44.3	Green
19	3.4.2.7 Proportion of mental illness cases referred to Level 5 by medical care	%	0.1	0.1	0.1	Green
20	3.4.2.8 Cumulative number of Class 1 drug offenders who participated in the replacement therapy	persons	708	686	688	Green
21	3.5.2.1 Number of persons treated for drug addiction	persons	799	840	The statistical method of the data is similar o the number of people in 3.4.2.8, and it is recommended to delete this indicator.	Red
22	3.5.2.2 Number of person referred for drug addiction	persons	799	840	The statistical method of the data is similar o the number of people in 3.4.2.8, and it is recommended to delete this indicator.	Red

Item	SDGS code and the City' s indicators	Unit	2017	2018	2019	Light
23	3.6.1.1 Number of traffic accidents per 100,000 people	Per 100,000 persons	13.04	15.34	15.63	Green
24	3.6.1.2 Number of accidents caused by motor vehicle	Number	37,667	39,491	38,770	Red
25	3.6.1.3 Drunk driving accident rate	%	3.82	2.93	2.74	Green
26	3.7.1.1 Maternity check-up utilization (At least 8 check-ups)	%	94.70	94.50	Annual report not yet released	Green
27	3.7.2.1 Number of adolescent girls under 15 years of age who have childbirth	persons	1	1	0	Yellow
28	3.7.2.2 Number of adolescent girls under 15 years of age who have childbirth in the past 5 years	persons	1.6	1.6	1.4	Green
29	3.7.2.3 Number of adolescent girls under 15 years of age who have childbirth in the past 10 years	persons	2.6	2.1	1.4	Green
30	3.7.2.4 The ratio of adolescent girls 15-19 years of age who have childbirth	‰	3	2	3	Green
31	3.9.1.1 AQI (air quality index)	%	3.2	3.8	2.7	Green
32	3.9.1.2 Vehicle exhaust emissions reduction (PM10)	metric tons	31.77	19.74	12.65	Green
33	3.9.1.3 Vehicle exhaust emissions reduction (PM2.5)		25.77	16.02	10.27	Green
34	3.9.1.4 Vehicle exhaustive emissions reduction (NOx)		53.14	33.40	21.40	Green
35	3.9.1.5 Vehicle exhaustive emissions reduction (NMXC)		402.90	250.70	173.10	Green
36	3.9.3.1 number of major mass food poisoning cases and persons involved	Cases/Persons	37 cases/ 518 persons	36 cases/ 405 persons	20 cases/ 966 persons	Red
37	3.a.1.1 Ratio of people over 18 years of age who smoke	%	13.9	11.8	Statistical data unavailable	Green
38	3.a.1.2 Ratio of high school and vocational school students (including 15–18-year-old junior college students) who smoke	%	7.3	5.3	6.3	Green
39	3.a.1.3 Medical disputes	Number	89	96	86	Green
40	3.a.1.4 Number of successful coordination cases of medical disputes	Number	29	43	39	Green
41	3.c.1.1 Physicians per 10,000 people	Per 10,000 persons	21.73	29.41	29.49	Green
42	3.c.1.2 Dentists per 10,000 people	Per 10,000 persons	5.74	5.94	6.01	Green
43	3.c.1.3 Nursing and child-delivery staff per 10,000 people	Per 10,000 persons	75.00	80.37	81.16	Green

Health category-SDG11

Item	SDGS code and the City' s indicators	Unit	2017	2018	2019	Light
1	11.1.1.1 Social housing units by 2030	Units	–	–	0	–
2	11.1.1.2 Area of adopted open space	Hectares	322.72	336.91	342.83	Green
3	11.2.1.1 Proportion of accessible buses in downtown areas (low-floor buses)	%	36	46	54	Green
4	11.2.1.2 Number of barrier-free taxis	Number	49	56	61	Green
5	11.3.1.1 Ratio of land consumption rate to population growth rate	Hectares	44.07	0	Data not yet released	
6	11.3.1.2 Total number of cultural facilities	Number	317	326	592	Green
7	11.3.1.3 Number of cultural facilities added this year	Number	5	20	5	Yellow
8	11.3.1.4 Annual growth rate of cultural facilities	%	2	6	0	Yellow
9	11.3.1.5 Number of monuments and historic buildings	Number	3	12	3	Green
10	11.3.1.6 Number of visits to arts and cultural facilities	In 10,000 person times	2,178.1	1,874.9	1,786.6	Green
11	11.3.1.7 Venues for arts and cultural activities (including hardware spaces)	Number	64	66	9	Green
12	11.3.1.8 Art and cultural groups	Number	284	289	288	Green
13	11.3.1.9 Performing sessions of arts and cultural activities	Number of sessions	7,377	6,493	57,09	Yellow
14	11.3.1.10 Participation in art and cultural activities and performances	In 10,000 person times	2,178	1,875	1,407	Green
15	11.5.1.1 Natural disaster deaths per 100,000 people	persons	0	0.11	0.05	Green
16	11.6.1.1 Resources recycling rate	%	50.58	50.58	55.77	Green
17	11.6.2.1 Annual average air quality value of particulate matters (PM2.5)	μg/m³	56.6	23.8	22.2	Green
18	11.6.2.2 Annual average air quality value of particulate matters (PM10)	μg/m³	25	55.7	49.7	Green

Healthy City Sustainable Development Goals - Statistics of the Four Categories of Quantitative Indicators

	Light	Society	Industrial economics	Environment	Health	Total
Indicator data Yearly increase	Green	54	52	17	44	16 7
Indicator data Yearly decrease	Red	1	0	0	4	5
Indicator data No change	Yellow	29	7	12	7	55
Data for 1 year only	White	0	2	1	2	5
Statistical data unavailable	-	0	1	0	1	2
Basic indicators	Basic	10	4	3	3	20
Four categories of quantitative indicators		94	66	33	61	254

Healthy City Sustainable Development Goals - Four Categories of Quantitative Indicators, Key to light colors

1. Red light: needs assessment on action implementation
   Statistics shows a yearly increasing trend, and it is necessary to review the policy direction, conduct lagging analysis, and implement improvement measures.
2. Green light: sustainable innovation
   Statistics shows a yearly decreasing trend, and the administration has achieved remarkable results.
3. Yellow light: need to strengthen the execution service
   The statistics shows no change. It is necessary to continue observing changes in the data.
4. White light: refers to the latest statistical data, with only the data of 1 year displayed.
5. “-” refers to: statistical data unavailable
6. Basic indicators: collection of data for analysis only, not listed for colored light indicators.

Advisors: Tainan City Government, Tainan City Low-carbon Adaptation and Sustainable Development Committee

Secretariat: Environmental Protection Bureau of Tainan City Government

Execution Units:

Public Health Bureau of Tainan City Government

Social Affairs Bureau of Tainan City Government

Education Bureau of Tainan City Government

Water Resources Bureau of Tainan City Government

Economic Development Bureau of Tainan City Government

Agriculture Bureau of Tainan City Government

Labor Affairs Bureau of Tainan City Government

Occupational Safety and Health Department, Labor Affairs Bureau of Tainan City Government

Public Works Bureau of Tainan City Government

Transportation Bureau of Tainan City Government

Urban Development Bureau of Tainan City Government

Cultural Affairs Bureau of Tainan City Government

Civic Affairs Bureau of Tainan City Government

2021

臺南市永續發展目標自願檢視報告

Tainan City Sustainable Development Goals Voluntary Local Review

臺南市政府

Tainan City Government

110年12月