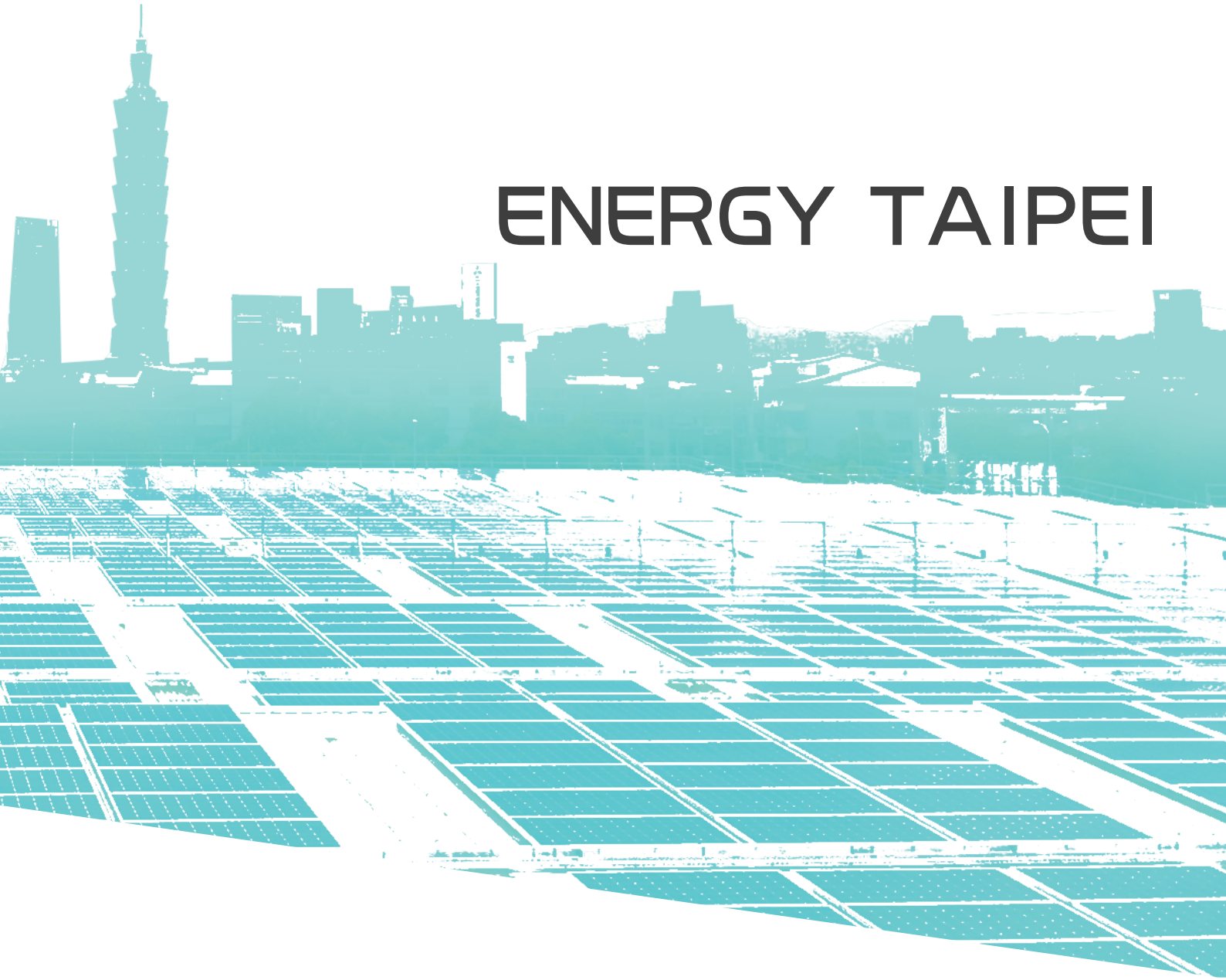
ENERGY TAIPEI



Sustainable Energy Taipei
White Paper

Low-Carbon I Green Energy I Sustainable City

Taipei City adopts the four cour policies, including “energy saving and carbon reduction,”“developing diverse energy sources,” “adapting to climate change,” and “developing a circular economy,” and launches eight major strategies, which are supplemented by complementary measures, as the development blueprint for energy policy, with a view to moving toward a new milestone of a low-carbon, green energy and sustainable city.

Sustainable Energy Taipei
White Paper

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Message from the Mayor

According to a study conducted by the World Economic Forum in 2019, the amount of global power usage in 2018 reached a record high in human history. In the face of climate change and energy depletion risks in the future, inclusive, sustainable, affordable, and safe plans for gentle energy transition and carbon reduction have become paramount worldwide.

Cities play a major role in combating climate change. In 2018, 55% of the global population resides in cities, and these cities generate 80% of the GDP. Also, cities consume over 66% of the world's energy and account for 75% of global carbon emissions.

"Facing the problem is the first step to solving it." As an international city, nearly 80% of Taipei City's power has been consumed by the residential and business sectors in the past years. Effectively promoting an energy-saving and carbon-reduction culture in these sectors has been a persistent challenge. The Taipei City Government has long been hosting discussions regarding these issues and using its action plans and policy review mechanisms to actively promote and review related policies on a rolling basis, thereby providing city residents with a better life while simultaneously focusing on environmental and economic development.

In recent years, the Taipei City Government has been actively promoting energy-saving and carbon-reduction plans. This year, "Energy Taipei" has been formulated to construct a vision of the energy use in Taipei City in 2030. Three energy development goals have been set, and four major policies and eight major strategic programs have been formulated to fulfill these goals, thereby achieving the ideal of "Livable City, Sustainable Taipei."

"Progressive Values, Glorious City" is a value I have long stood for. While the world is facing with the challenges brought by climate change, Taipei City, as an international city and Taiwan's capital, shall shoulder the responsibility of responding to climate change and face the challenges of energy transition with the utmost courage and dedication.

Taipei City Mayor Wen-Je Ko

Responding to Global Initiatives

Taipei City actively response to global climate actions and sustainable development initiative. To jointly confront to climate change and energy risks, Taipei City link up with the world by establishing close partnerships with cities worldwide, in hopes to ensure that everyone in Taipei City can enjoy affordable, stable, sustainable and modern energy. Furthermore, improve the efficiency of resource production and energy consumption, reduce damages caused by the city to the environment and ultimately moving toward the goal of sustainable, energy-efficient, green and eco-friendly growth of the city.

United Nations Sustainable Development Goals (SDG 17 for 2030)

In 2015, the United Nations (UN) announced 17 Sustainable Development Goals (SDGs) to plan the direction of global efforts in the next 15 years. These goals clearly cover three major areas, namely the environmental, economic, and social aspects, while energy issues play a central role in the path of sustainable development:

Affordable and Clean Energy

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

Sustainable Cities and Communities

Reduce the per capita damage to the environment in the city, such as air, garbage, and urban environment.

Decent Work and Economic Growth

Improve the efficiency of global resource production and consumption, and abandon growth based on environmental damage

Climate Action

Increase efforts to reduce greenhouse gas emissions and draw up complete climate change mitigation and adaptation actions.

Industry, Innovation and Infrastructure

Upgrade and transform infrastructure and industries toward sustainability, energy efficiency, green energy, and environmental protection

Paris Agreement

Energy development and use emits large amounts of greenhouse gases, resulting in global warming. How to reduce environmental impact and yet continue sustainable energy development has become a challenge we now all face.

- **The agreement was adopted in the UN Climate Change Conference in December 2015(COP21), and was jointly ratified by 171 countries in April 2016.**
- **The agreement came into effect on November 4, 2016, replacing the Kyoto Protocol, in hopes that the world can jointly curb the trend of global warming.**
- **The agreement aims to keep the global temperature rise of this century within 2 degrees Celsius above pre-industrial levels and limit the temperature increase even further to 1.5 degrees Celsius.**

2030 Energy Development Vision -
Leading Taipei Toward a Low-Carbon, Green Energy and Sustainable City

As a capital with highly intensive industrial and commercial development, Taipei City is also the center of economic development in Taiwan. In order to lead Taipei City toward a low-carbon, sustainable capital, Taipei City's energy policy is mainly designed around "saving, efficiency and innovation," with a balance between various aspects, including economic development, energy security and efficiency, and urban environment adaptation, to formulate Taipei City's energy policy program as the superior guiding principle. Three development directions were set, namely building an energy saving environment, expanding green energy supply, and driving industrial transformation, with "leading Taipei City toward a low-carbon, green energy and sustainable city" as the 2030 Energy Development Vision.

Building an Energy Saving Environment

Taipei City will build a proactive energy saving culture using innovative and diversified promotion mechanisms to encourage companies and citizens to work together on energy saving. Energy saving and carbon reduction actions are implemented by raising citizens' willingness on a large scale, which in turn improves the effectiveness of energy saving and enhance the image of Taipei City. In line with climate change adaptation strategies, the city's resilience against extreme climates and its ability to recover from climate disasters will be increased, thereby achieving a sustainable environment in Taipei City.

Expanding Green Energy Supply

In response to the central government's energy transition policy by expanding the renewable energy installations and application, Taipei City encourages companies and citizens to invest in green energy installations. At the same time, Taipei City is actively rolling out smart grids through modern electric power grids that combine power generation, transmission, distribution, and the user end by adding information and communication technology (ICT) and power storage equipment to the traditional electric power system, in order to effectively improve the efficiency of power supply and demand and the flexibility of power system scheduling, thereby stabilizing various economic activities in the city.

Driving Industrial Transformation

Since green economy has become the future trend of industrial development, Taipei City has been investing resources and providing counseling based mainly on “green innovation" to encourage innovative energy saving technologies and introduce the concept of circular economy, which drives the upgrading and transformation of companies in the city. At the same time, Taipei City has rolled out the green financial market and takes the lead in renewable energy certification in order to promote and enhance the development and capability of the green energy industry, so that both company growth and the environment can co-exist and co-prosper, thereby enhancing the competitiveness of the green industry in Taipei City and building a new look of green economy.

Three Major Goals of the Energy Policy for 2030

To achieve the 2030 Energy Development Vision, Taipei City truly stocktakes its local energy resources and actively implements carbon reduction strategies based on the "Taipei City Carbon Reduction Targets" and in accordance with the "National Energy Transformation Policy Direction" and the "International Cities Carbon Reduction Targets." Taipei City also plans and proposes three quantitative goals, namely proactive energy-saving, smart green energy, and low-carbon for sustainability for the City's energy transition in 2030, in hopes of gradually achieving the vision of energy transition along with the city's progress in meeting greenhouse gas (GHG) reduction targets.

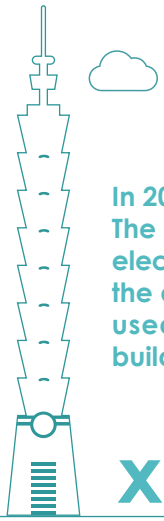
Proactive Energy-saving

Reach 13.5% in electricity savings

(as a percentage of total electricity usage in 2018) [1]

Taipei City stocktakes energy saving and carbon reduction measures related to the implementation plan for the first phase of GHG control and the key measures in Taipei City's energy development in 2030, as well as calculates the planned implementation of energy saving and GHG reduction measures to estimate the effectiveness of Taipei City's overall electricity saving strategy in 2030, thereby setting the 2030 energy saving target of approximately 2.16 billion kWh, which is equivalent to "saving the amount of electricity used by 50 units of Taipei 101[2]."

Taipei City promotes the policy using announcements that are close to everyday life that the people can relate to, so that companies and citizens can work together on adopting a new energy saving lifestyle.



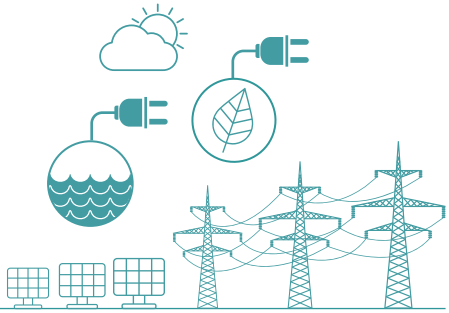
In 2030, The amount of electricity saved equals the amount used by 50 Taipei 101 buildings

x 50

Smart Green Energy

Increase renewable energy installation capacity to 3 times (compared to 2018) [1]

To increase its energy self-sufficiency rate and expand the application of renewable energy installations, Taipei City strengthens the development of renewable energy sources, including solar energy, biomass energy, hydropower, and geothermal energy to garner energy sources required for urban activities, as well as estimates the development blueprint based on the progress and potential of renewable energy installations in the City. Although Taipei City has a smaller hinterland than other international cities, the 2030 renewable energy installation target is proposed after careful assessment of the feasibility and potential of these installations. According to estimation, the installed renewable energy capacity in 2030 (excluding the conventional hydropower and incinerators) will reach up to 62.76 MW, which is three times more than 18 MW in 2018. This demonstrates the efforts made by Taipei City in actively developing renewable energy with limited resources.



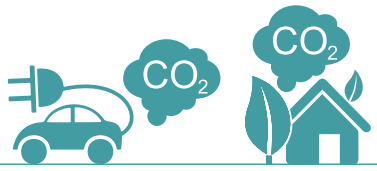
Low-carbon for Sustainability

Reduce carbon emissions by 25%

(compared to 2005) [1]

Taipei City spontaneously promotes GHG reduction and jointly assumes its due responsibilities in the face of climate change. Taipei City clearly specifies the content and specific methods of various energy saving and carbon reduction policies in accordance with the "Greenhouse Gas Reduction and Management Act," in order to shape the common energy saving and carbon reduction targets for all citizens. In order to combat global climate change, Taipei City has set medium- and long-term carbon reduction targets. With 2005 as the base year, Taipei City's medium- and long-term targets are to reduce carbon emissions by 25 percent in 2030 and 50 percent in 2050, respectively.

In 2030, carbon emissions reduced by 25%, equivalent to the carbon uptake of 8,400 Da'an Forest Parks



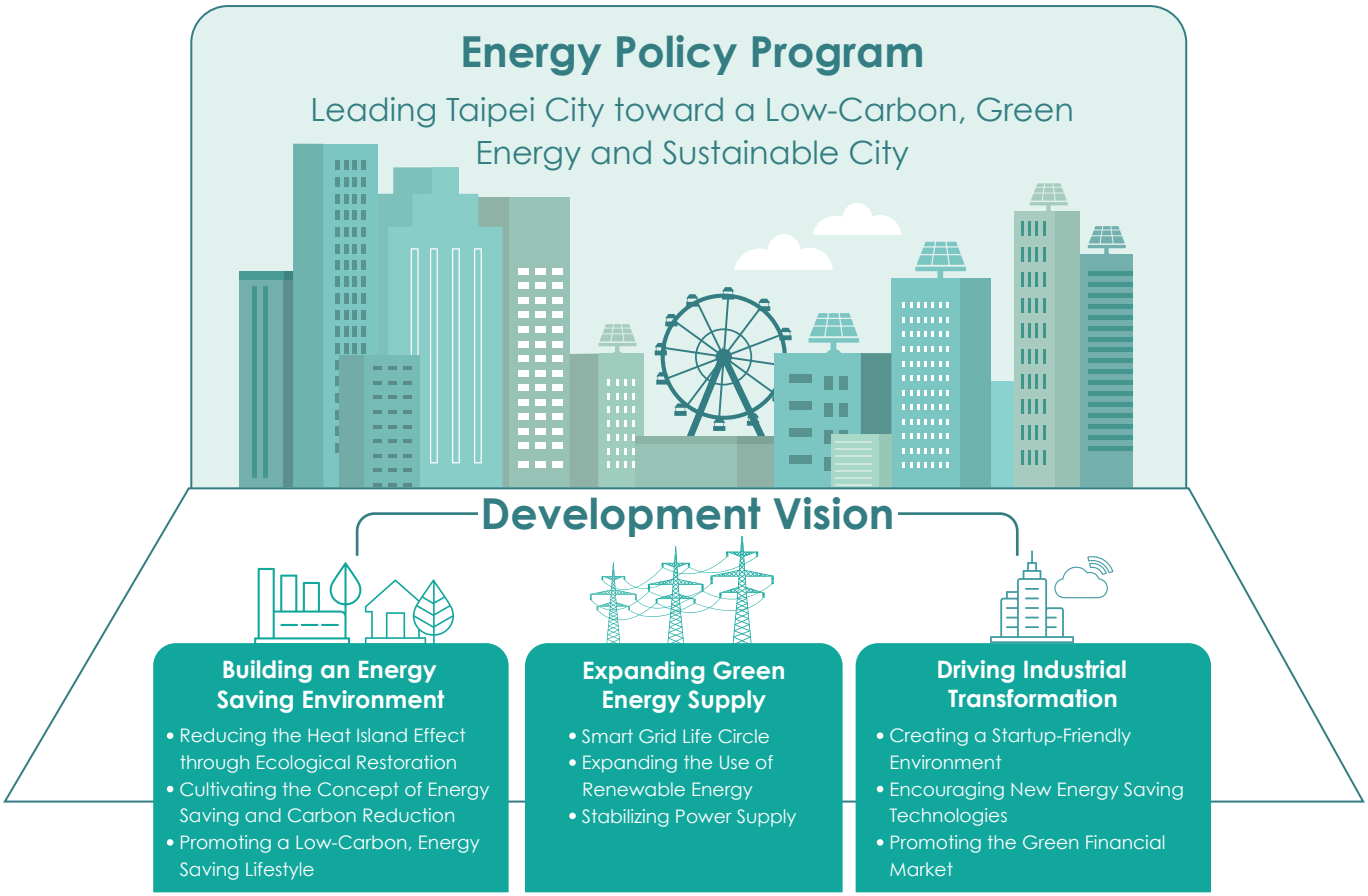
Note 1: Taipei City used 16.193 billion kWh of electricity in 2018. The installed renewable energy capacity in Taipei City in 2018 was 18 MW. In 2005, the amount of carbon emissions in Taipei City was 13.0736 million tons CO_2e.

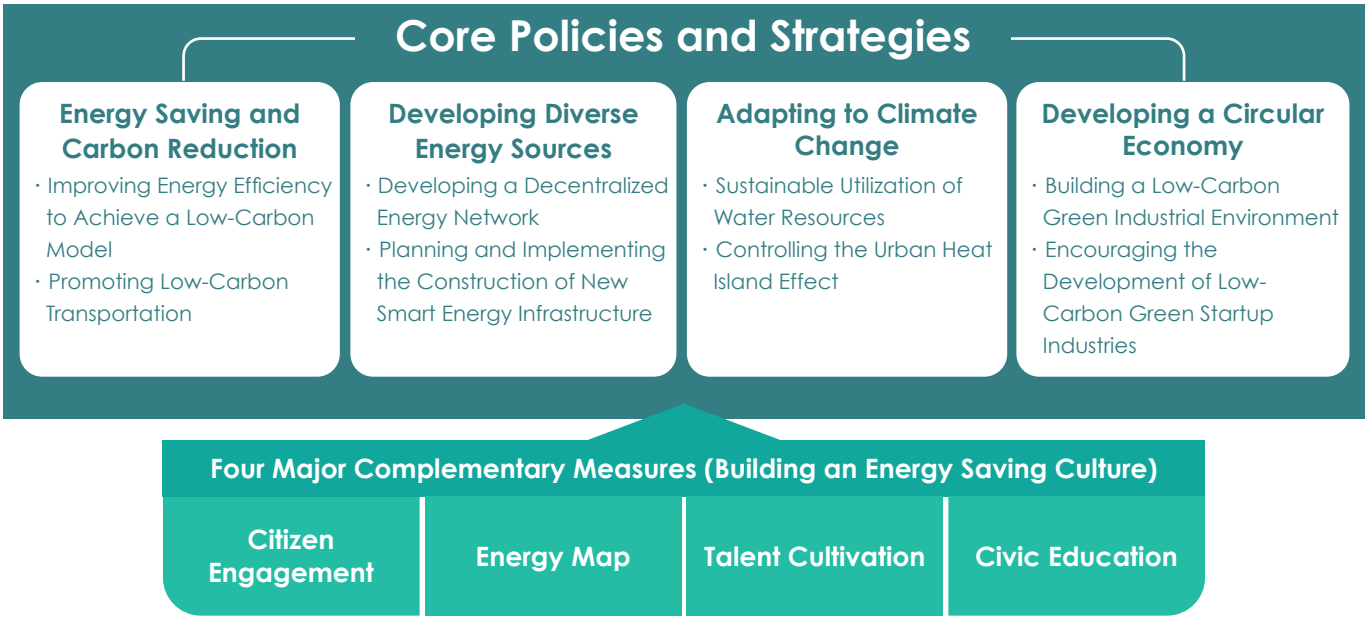
Note 2: Taipei 101 is a benchmark green building in Taipei City with an annual electricity usage of approximately 40 million kWh.

Strategic Framework for Energy Policy

Committed to becoming a green energy capital, Taipei City is actively promoting renewable energy. Besides, Taipei City is the top electricity-saving city in Taiwan and also the only city among the six special municipalities that experience both economic growth and zero growth in electricity usage.

Drawing on international experience and pooling the city's development energy, we have drawn up the "Taipei City Energy Policy" to launch eight major strategies based on four core policies, including "energy saving and carbon reduction," "developing diverse energy sources," "adapting to climate change," and "developing a circular economy," which are supplemented by complementary measures, as the development blueprint for 2030, with a view to leading Taipei City to a new milestone of a low-carbon green energy capital and a sustainable city.





Rolling Out Four Core Policies / Eight Strategies

Energy Saving and Carbon Reduction

Improving Energy Efficiency to Achieve a Low-Carbon Model

Promoting Low-Carbon Transportation

Approximately 70 percent of GHG emissions in Taipei City are caused by the use of electricity. In order to implement energy saving and carbon reduction, Taipei City actively promotes equipment replacement in government agencies and schools, as well as guides various departments in implementing energy saving measures, thus effectively achieve negative growth in electricity usage. Taipei City ranks first in terms of electricity saving rate among the six special municipalities, thereby becoming the only city with both economic growth and zero growth in electricity consumption in the industrial and commercial sectors. At the same time, Taipei City has created a seamless and diversified integrated transport system by setting up "green energy, sharing, safety and digitization" and developing a people-oriented transportation environment to create the value of "green energy and low-carbon" in the city.

Developing Diverse Energy Sources

Developing a Decentralized Energy Network

Planning and Implementing the Construction of New Smart Energy Infrastructure

To become a smart green energy capital, Taipei City actively expands the development and utilization of renewable energy. By promoting solar photovoltaic (PV) as the main force, Taipei city opens up city-owned properties and encourages companies and citizens to jointly participate in electricity generation. Meanwhile, diversifying the development of energy applications, which includes biomass energy, geothermal energy, micro-hydropower and other energy sources, in order to build a decentralized energy network and increase energy self-sufficiency. Besides, the public sector leads in setting up empirical sites for smart grids by adopting strategies including "site-type planning," "expanding the use of green energy" and "establishing design guidelines" to demonstrate the diversified application model of smart energy systems in a metropolitan area, in hopes of gradually realizing energy transition.

Adapting to Climate Change

Sustainable Utilization of Water Resources

Controlling the Urban Heat Island Effect

For sustainable development, cities must possess tolerance and resilience to adapt to changes, and need to combine water resources, land use and the foundation of natural ecosystem, in order to create a livable city with resilience. Aiming to become a sponge city and an idyllic city, Taipei City continues to increase rainwater storage, lower urban temperature using the evapotranspiration effect, and ensure the stormwater and flood detention effects. Besides, Taipei City focuses on roof greening and campus greening, expanding green spaces for public facilities and potential green foundations, creating more space for water retention, storage and detention, as well as increasing urban green overage, in order to reduce the heat island effect and adapt to climate change.

Developing a Circular Economy

Building a Low–Carbon Green Industrial Environment

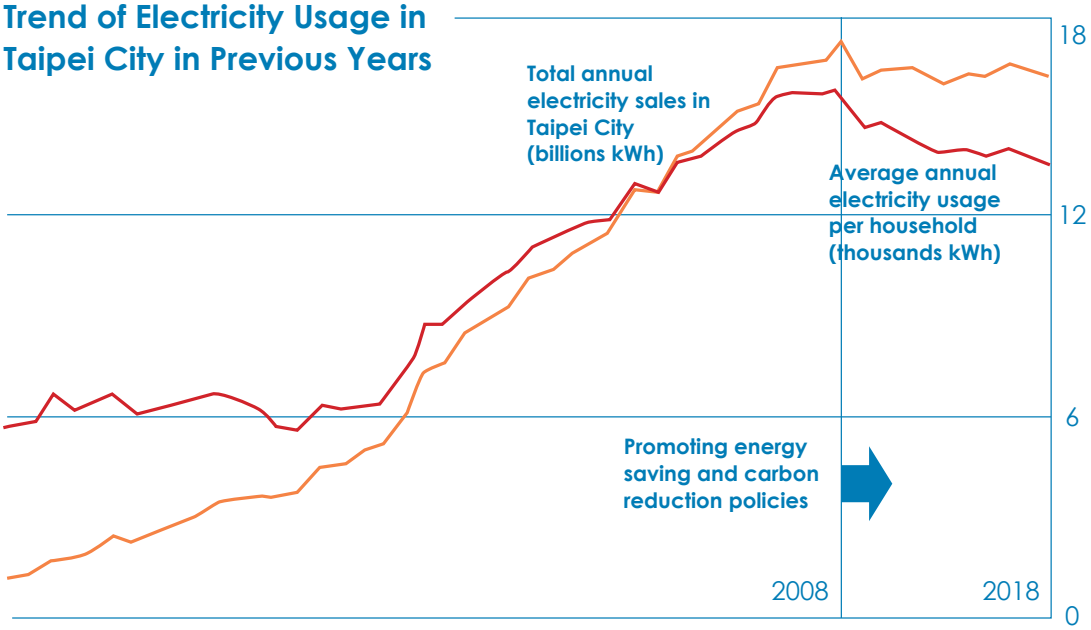
Encouraging the Development of Low–Carbon Green Startup Industries

Business models with economic value are re-created through a development model based on the cycle of "resources, production, and recycled resources." To promote the development of startup industries and innovative business models, Taipei City provides numerous industrial aids, including entrepreneurship, research and development (R&D), branding, incubation, as well as rewards and subsidies. Additionally, Taipei City pushes government agencies and encourages private companies to expand green procurement and cooperate with banks to promote green energy financing. In response to the green energy trading mechanism, the City leads the green energy industry towards further expansion, creating green employment opportunities, and achieving the goal of economic innovation and growth as well as sustainable social development on the premise of environmental protection.

Energy Saving and Carbon Reduction

Taipei City reduces electricity usage per capita based on the balance between urban development and economic needs. For instance, Taipei City guides the promotion of green energy transportation and shared transportation in response to the huge transportation energy demand arising from booming business activities and tourism. As for densely located residential-commercial buildings, it is not easy to set up solar power sites over. Taipei City takes the advantage of owning a massive number of public sector buildings, first public then private, develop renewable energy and promote an energy saving culture from the inside out.

Trend of Electricity Usage in Taipei City in Previous Years



Source: Taiwan Power Company (Taipower) and Department of Budget, Accounting and Statistics, Taipei City Government

Improving Energy Efficiency to Achieve a Low-Carbon Model

Promoting Energy Saving Improvements at Government Agencies and Schools in Taipei City

Promoting and subsidizing the replacement of old lighting fixtures in schools

In line with the "Residential and Commercial Electricity Saving Action Plan Jointly Promoted by Counties and Cities - Campus Energy Renovation Subsidy Program" launched by the Ministry of Economic Affairs from 2018 to 2020, Taipei City promotes the replacement of old lighting fixtures in schools under its jurisdiction. New lighting fixtures should have a luminous efficacy of over 100lm/W after replacement. Taipei City incorporates smart lighting at indoor parking lots, where such lighting fixtures have a luminous efficacy of over 120lm/W and more than one smart lighting control function, such as automatic switch, dimming, or timing control. The luminous flux of the lighting fixtures above must meet the requirements of national standards for designated places, and the Ministry of Economic Affairs will subsidize 50 percent of the cost of each lighting fixture. As of 2019, Taipei City has approved subsidies for a total of 148 public schools at all levels, and replaced a total of 97,563 lighting fixtures. It is estimated that a total of 817,563 lighting fixtures will be replaced by 2030.

Promoting and subsidizing the replacement of old and non-energy-saving air conditioners in schools

In line with the regulations set forth by the Executive Yuan, replacement assessment shall be conducted on air conditioners that have been used for over nine years. It is recommended that priority shall be given to the use of inverter-type central air-conditioning units or air conditioners. Furthermore, in line with the "Residential and Commercial Electricity Saving Action Plan Jointly Promoted by Counties and Cities - Campus Energy Renovation Subsidy Program" launched by the Ministry of Economic Affairs from 2018 to 2020, the Taipei City Government has carried out the replacement of energy-saving air conditioners (referring to those whose rated air-conditioning capacity is less than 71kW in compliance with the requirements of the Chinese National Standards, namely CNS3615 and CNS14464, and which are included in the items subject to inspection by the Bureau of Standards, Metrology and Inspection (BSMI), Ministry of Economic Affairs) in affiliated schools, and encourages the installation of energy management systems (in which monitoring and automatic uninstallation can be set to save electricity). After replacement, the new air conditioners shall comply with Level 1 or 2 products as specified in the "Allowable Energy Consumption Standards for Ductless Air Conditioners and Labeling, Methods and Inspection Methods for Energy Efficiency Classification." As of 2019, Taipei City has approved subsidies for the replacement of air conditioners for a total of 132 public schools at all levels, and replaced a total of 5,615 air conditioners.

It is estimated that a cumulative total of 12,015 non-energy-saving air conditioners will be replaced by 2030.

Providing guidance on energy saving to government agencies and schools in Taipei City

In order to implement energy saving and carbon reduction responsibilities, Taipei City has set up energy saving guiding teams at government agencies and schools to provide them with technical guidance on improving energy efficiency and offer recommendations on energy saving and carbon reduction, including analysis of electricity usage. Besides, Taipei City also provides multi-faceted benefit assessment and suggestions, such as analysis of Taipower's pricing methods, analysis of optimal contractual capacity, power factor improvement for equipment, and replacement of energy-saving equipment, so that energy managers can apply such assessment and suggestions to energy usage in their own buildings and equipment, as well as fully understand and properly plan energy saving measures, achieving effective energy management. According to statistics on energy saving guidance, a total of 120 government agencies and schools have received such guidance from 2015 to 2019, recording a cumulative total electricity saving potential of 14.37 million kWh and a cumulative total carbon reduction of approximately 7,577 metric tons. It is estimated that the cumulative total electricity savings will reach 27.66 million kWh and the cumulative total carbon reduction will reach approximately 14,613 metric tons by 2030.

Neihu Precinct, Taipei City Police Department: Inspection of central air-conditioning unit

Taipei Municipal Hu Shih Elementary School: Discussion on electricity usage in the school

Promoting Energy Efficiency Improvement in the Residential, Commercial, Industrial, and Agricultural Sectors by Providing Free Guidance and Replacement Subsidies

Providing guidance on energy saving and carbon reduction to the residential and commercial sectors

Taipei City provides an energy saving technical service team for the residential and commercial service sectors. The purpose of on-site technical guidance is mainly to understand the operating data and rationality of energy equipment and propose specific improvement suggestions and measures. Especially for the most energy-consuming chillers, energy use diagnosis is conducted to identify the reasons for consumption and assist in the implementation of various energy saving measures. This initiative is implemented by combing various energy saving approaches, such as guidance services, technical exchanges, awards and regulatory inspection. Through the energy saving assessment and guidance initiative for the residential and commercial sectors, a total of 436 companies have received guidance since 2008, saving up to 123 million kWh of electricity. In the future, Taipei City will continue to implement the energy saving promotion program for the residential and commercial sectors, aiming to provide energy saving guidance to 90 companies and save up to 20 million kWh every year.

Energy Saving Guidance Service

Provide energy users with guidance to unearth energy saving potential, as well as introduce users who have difficulty in improving project costs or encounter complex technical levels to energy service companies (ESCO) to carry out energy saving improvement projects, in order to increase users' willingness to implement energy saving improvements.

Technical Exchange

Organize energy saving technical exchange seminars and energy manager training courses to increase the number of energy saving application technologies and spread the effects of energy saving.

Energy Saving Leadership Awards

Increase the energy saving self-management ability of companies by organizing energy saving and carbon reduction awards, such as the Energy Saving Leadership Awards, in order to encourage users to strive for outstanding performance in energy saving management through the selection of top-performing energy-saving companies.

Promotion of Regulatory Inspection

Implement on-site promotion, inspection, and energy saving testing in accordance with the energy saving regulations which shall be complied with by various types of energy users designated in Article 8 of the Energy Administration Act, as well as provide technical consultation and guidance on energy saving to users who fail to comply with these regulations or have difficulties in implementing them.

Guiding districts and villages to participate in low-carbon accreditation

Building a low-carbon city requires the implementation of low-carbon actions from the bottom up, districts and villages are set as the basic unit. Through the participation of districts and villages in the low-carbon accreditation established by the Environmental Protection Administration (EPA), low-carbon actions, which include ecological greening, low-carbon living, green transportation, resource recycling, green energy and energy saving, and sustainable management, are self-implemented in the communities. Besides, Taipei City also inspects the implementation of these measures, and gradually builds and expands the scope of districts and villages that have successfully obtain low-carbon accreditation, in order to achieve the goal of becoming a low-carbon city.

First, Taipei City stocktakes administrative villages with low-carbon potential, carries out campaigns on low-carbon accreditation and observe low-carbon communities, promotes low-carbon measures in districts and villages and organizes experience sharing sessions, as well as offers guidance on applications for low-carbon accreditation and provides administrative assistance on reviewing procedures. In addition, Taipei City subsidizes administrative villages with low-carbon potential in setting up low-carbon facilities and offers guidance on facility maintenance and management. As of 2019, a total of 12 administrative districts and 174 villages have participated in the low-carbon accreditation, with a participation rate of 60.3 percent, where 64 villages and 6 villages received bronze and silver levels, respectively. In the future, Taipei City will gradually increase the participation rate to an estimated 84 percent by 2030, and ensure that low-carbon villages can continue to maintain low-carbon accreditation or achieve a higher level of accreditation after being accredited the first time.

Subsidizing communities in energy-saving renovations and replacing energy-consuming equipment in public spaces

Rainwater harvesting: A subsidized low-carbon facility in the community - Chungshun village, Wenshan District

Old energy-consuming equipment in the residential sector, such as air-conditioning systems, chillers and lighting equipment, are often the main cause of high electricity consumption. In order to continuously promote the implementation of energy saving and carbon reduction in communities, the Taipei City Community Energy Saving Renovation Subsidy Program has been launched to carry out large-scale equipment replacement and renovation through energy-saving equipment replacement subsidies, with a view to improving the energy efficiency of public electricity usage in communities. The subsidy program consists of four plans: subsidies for building energy management systems; subsidies for replacing old air-conditioners with air-conditioners with Energy Label Level 1 or Level 2; subsidies for replacing lighting fixtures with LED lights; and subsidies for replacing old chillers in central air-conditioning systems with chillers that comply with energy efficiency standards. During the implementation of this program from 2015 to 2019, a total of 497 communities have been subsidized, saving a cumulative total of 17.57 million kWh of electricity and NT$57.99 million in electricity charges, as well as reducing a total of 93.39 metric tons of carbon emissions. It is estimated that a total of 1,267 communities throughout Taipei City will be subsidized by 2030.

Promoting Low-Carbon Transportation

Planning to Build a Complete Bicycle Road Network and Connecting it with Public Transportation to Increase People's Willingness to Use Bicycles After Taking Public Tansportation

Carrying out the Taipei City Public Bicycle Promotion Program

Public bicycles are part of public transportation. In combination with the backbone of the mass rapid transit (MRT) route network, supplemented by extensive bus transportation, Taipei City has built a comprehensive public transportation service network that offers stable, reliable and convenient services, to gradually reduce the use of private transportation.

YouBike, a public bike-sharing system in Taipei City, has set up a total of 400 stations and provides a total of 13,072 bicycles. YouBike offers transfer fare discounts in order to develop the habit of bike-sharing among the public. In 2019, YouBike hit a record high of more than 28.46 million bicycle rentals, while the cumulative number of bicycle rentals exceeded the 150 million times mark. It is estimated that YouBike will record over 33 million bicycle rentals in 2030, thereby becoming not only a mode of transportation in citizens' lives, but also a model of success in global low-carbon transportation and a highlight of urban marketing.

A station of the public bike-sharing system

Swiping the All Pass Ticket

Promoting the All Pass Ticket

In order to enhance green transportation and encourage private transportation users to take public transportation, the Taipei City Government and the New Taipei City Government worked together to roll out the "All Pass Ticket" in April 2018, to strengthen the connection service between modes of public transportation through intermodal transportation comprising MRT, light rail transit (LRT), bus and YouBike, as well as providing the public with a favorable public transportation ridership plan. In addition to giving back to existing public transportation users, this initiative also attracts private transportation users who are long-distance commuters, encouraging them to develop the habit of commuting using public transportation.

As of 2019, a total of 5.8 million All Pass Tickets have been sold, with a renewal rate of 96 percent. Public transportation volume in both Taipei City and New Taipei City grew by 3.2 percent in the year following the implementation of this initiative, with an increase of 47.77 million person-times in annual transportation volume. By 2030, Taipei City aims to achieve an annual growth of 1 percent to 2.5 percent, so that the public can move and commute within the city more efficiently.

Building an Electric Vehicle-Friendly Environment

Installing charging ports at public parking lots

In line with Taiwan's full automobile and scooter electrification policy for 2040, Taipei City is building an electric vehicle (EV)-friendly environment. Since 2017, Taipei City has been actively installing EV charging facilities in public parking lots to increase citizens' willingness to use EV. Taipei City aims to complete installation of charging ports in all public parking lots, and has allocated subsidies to promote applications for charging facilities at parking lots owned by government agencies and schools in the city. As of 2019, a total of 314 charging stations have been set up at public parking lots in Taipei City. New charging ports will be installed on a rolling basis in response to the growth trend of EV in the future.

EV charging ports

Reserving space for installing charging equipment wiring in new buildings

In conjunction with the "Electric Scooter Industry Innovation Jumpstart Project" approved by the Executive Yuan in December 2017, the "Air Pollution Control Action Plan" promulgated by the Executive Yuan in December 2018, and the future needs of the elderly population, the Ministry of the Interior amended Article 62 of Building Design and Construction under the Building Technical Regulations by adding Subparagraph 4 which stipulates that "Space shall be reserved in parking lots for the installation of equipment and devices related to electric vehicle charging in accordance with the Rules for Installation of Household Electrical Equipment, and to provide convenient access for people with reduced mobility." The implementation of this amendment began on July 1, 2019.

At present, Taipei City issues approximately 230 construction licenses every year. When reviewing construction licenses, Taipei City requires that design drawings must be planned in accordance with the Building Technical Regulations and the space for installing equipment and devices related to EV charging must be indicated in detail.

Promoting Green Energy Transportation

Promoting electric public buses

The Taipei City Government has launched the "Taipei City Electric Bus Promotion Pilot Project" since 2018, and plans to replace all gasoline-fueled buses in the city with electric buses, in line with policy goals such as full electrification of city buses by 2030 as declared by the Executive Yuan. In the early stage, Taipei City plans to implement mileage subsidy for four years by means of purchasing electric bus services in a pilot project, as well as establish the "Taipei City Operating Principles of Mileage Subsidy for the Operation of Electric Public Buses" to encourage bus operators to give priority to replacing old diesel buses with electric buses with a subsidy of NT$5 per kilometer traveled and to put more electric buses into operation. Over the long term, Taipei City plans to collect operating data during the pilot period and include the cost of electric buses into the calculation of fares, so as to improve the overall subsidy mechanism, in hopes that city buses throughout Taipei City will be fully electrified by the end of 2030.

Electric Bus No. 66

As of 2019, Taipei City has 22 electric buses on the road. In line with the newly established "Operational Directions for Highway Public Transportation Subsidies for Electric Large Passenger Vehicles" promulgated by the Ministry of Transportation and Communication in August 2019, Taipei City will continue to actively encourage all bus operators under its jurisdiction to carry out the replacement of old vehicles. It is estimated that the goal of having 3,500 electric buses in operation will be achieved by 2030.

Promoting Shared Transportation

Promoting the scooter/car sharing program

In order to decrease the ownership of private transportation and parking demand, reduce the costs of transportation facilities, and improve the urban environment, Taipei City applies the successful experience of YouBike public bike-sharing system, to the promotion of scooter and car sharing services. By bringing in scooter and car rental operators, and making use of the legal parking spaces, such as on-street and off-street parking lots, as well as establishing the "Taipei City Self-Governance Ordinance for the Management of Shared Transportation Industry", the program is implemented through privately-operated convenient vehicle rental services, which allow users to borrow and return vehicles at any time, so that the public can use vehicles when they need to, without buying vehicles.

As of 2019, scooter sharing service operators, WeMo and iRent, have provided 10,337 scooters for sharing, and it is estimated that a total of 20,000 scooters will be available for sharing throughout Taipei City by 2022. Meanwhile, car sharing service operator, iRent provides cars for sharing in the city, with a total of 500 cars provided for sharing in 2019, and it is estimated that a total of 1,500 cars will be made available by 2022. It is hoped that these services can supplement the lack of access to the public transportation system and reduce the purchase of private vehicles, thereby achieving the vision of an energy saving- and carbon reduction-friendly city.

Car sharing service operator, iRent


Scooter sharing service operator, WeMo

Promoting Shared Parking Spaces

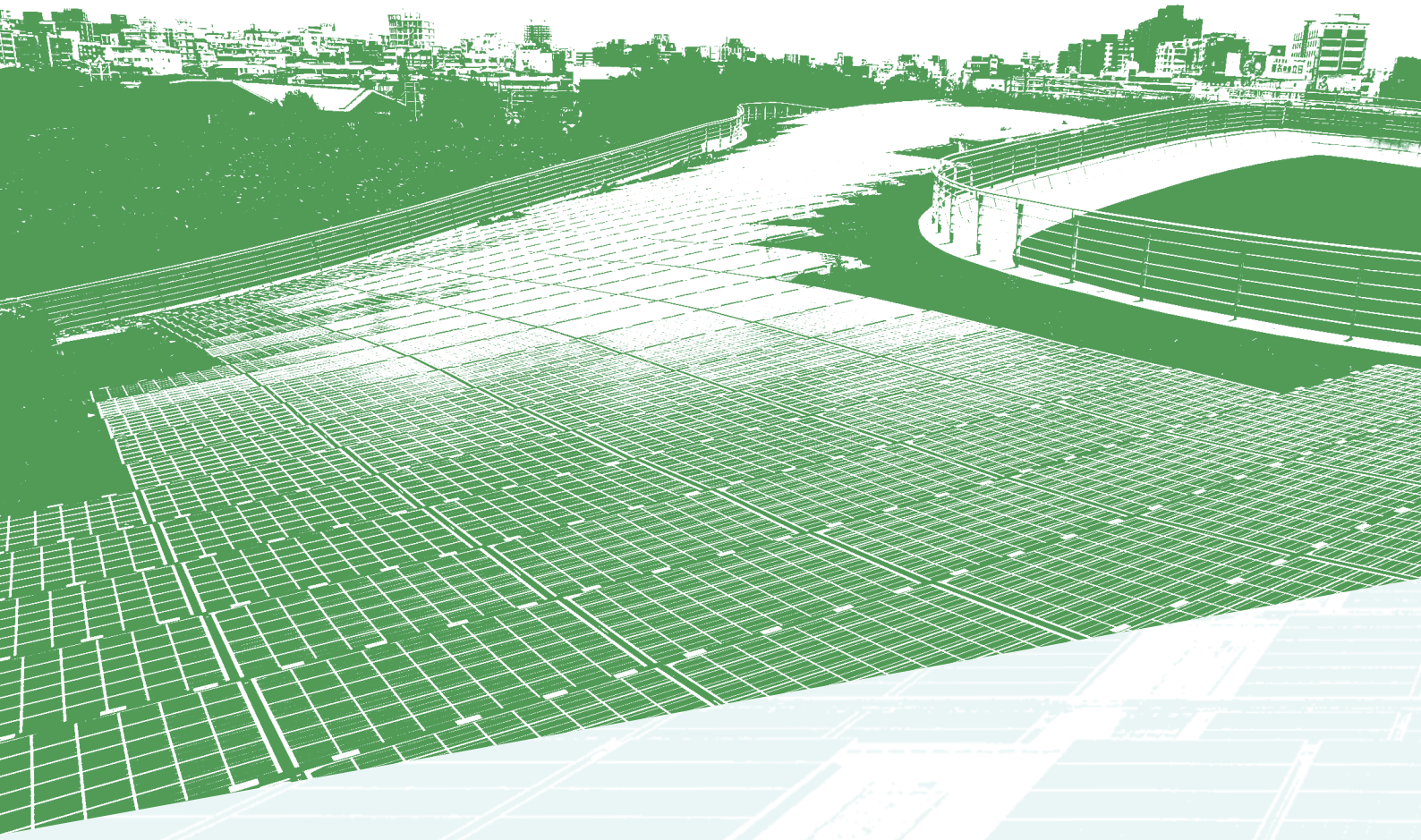

Shared parking spaces provided by USPACE

Shared parking spaces provided by UPARK

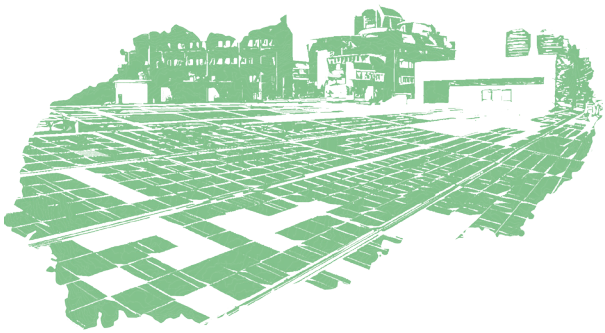
Taipei City provides shared parking spaces by taking the lead to launch the "Taipei City Government Plan for Making Parking Lots at Government Agencies and Schools at All Levels Available for Public Use." This is applied not only by using existing public parking resources and make existing parking lots at government agencies and schools available for public use, but also by seeking to build new parking lots on idle public land and ease the requirements for private parking lot operators to apply for setting up temporary off-street parking lots. In addition, Taipei City has formulated the "Parking Space Registration Program for Parking Space Sharing and Matching Service Operators 2.0" to encourage parking space sharing and matching service providers to use limited legal parking resources in a flexible manner to offer parking space matching services to the public. As of 2019, Taipei City has set up 2,495 shared parking spaces. It is estimated that by 2030, a total of 3,000 new parking spaces will be added every year, in hopes of re-allocating idle parking resources to overcome parking problems in the city.

Developing Diverse Energy Sources

Taipei City increases its energy self-sufficiency rate by developing diverse energy sources, and incorporates "smart microgrid" systems that combine solar PV, wind power generation and energy storage equipment at various sites, such as public housing, campuses, government agencies and parks. In the next four years, Taipei City will gradually complete the jigsaw puzzle of smart grid sites in the city and reduce electrical energy consumption, while promoting the use of renewable energy to reduce the burden of energy sources on the environment, and improve the stability of the overall power supply in the city.



Developing a Decentralized Energy Network



Actively Promoting the Installation of Solar Energy Systems on the Rooftops of Government Agencies and Schools and in the Private Sector

Promoting the installation of ground and rooftop solar PV equipment in Taipei City

In order to prioritize the use of local, sustainable and renewable energy, Taipei City has launched Solar Taipei to accelerate the installation of solar PV systems in the city owned real estate tenders and subsidies for private homes. In terms of city-owned real estate tenders, the land will be provided by the city government and funded by contractors to build, maintain and manage the PV system. As such, the Taipei City Government can receive feedback funds from vendors' electricity sales income.

In addition, Taipei City has launched the "Taipei Energy Hill" project to revitalize waste landfills, and established the first landfill solar power plant in Taiwan with an installed capacity of 1,996.8kW at the Fudekeng Environmental Restoration Park in Taipei City. During the second phase of the "Taipei Energy Hill" project, solar power plants have been established on the landfill of Shanshailu Eco Park in Nangang and the rooftop of Neihu Resource Recycling Center, with an installed capacity of 1,478.64kW. As of 2019, solar power plants have been established at 156 government agencies and schools, while the total installed capacity of central and private units were 28,932kW compared to 3,122kW in 2014, an increase of over nine times in the past five years.

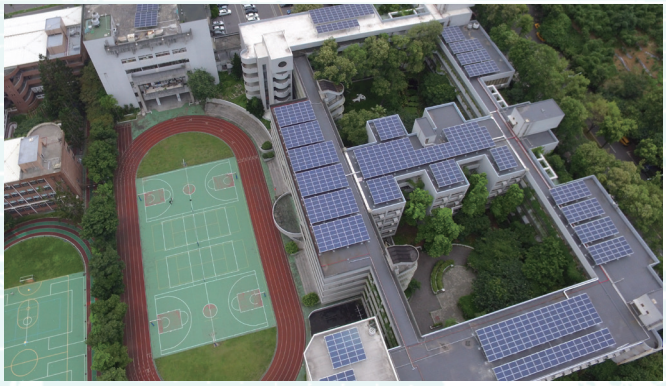
Subsidizing the private installation of solar PV

For private home subsidies, each case can receive up to 35 percent of the sum, which is the highest in Taiwan. Furthermore, Taipei City has also established a professional team and set up a single channel for accepting applications to proactively assist the public in applying for installation and subsidy. From 2017 to 2019, installation has been completed for a cumulative total of 40 applications, with an installed capacity of approximately 892.83kW. By 2030, Taipei City will continue to provide subsidies totaling NT$4.6 million every year.

Taipei City promotes the installation of solar PV in the public and private sectors, with a cumulative installed capacity up to 28,932kW as of 2019. In the future, Taipei City will continue to assess the potential for installing solar PV in idle spaces at government agencies and schools in the city, as well as subsidize both the private and public sectors and encourage the public and communities to install solar PV on the idle rooftops of buildings, in order to accelerate the installation and application of solar PV systems in the city. Taipei City aims to generate above 50MW of solar power by 2030.

Solar PV system at Lanya Elementary School

Solar PV system at Shidong Market



Solar PV system at Tianmu Junior High School

Solar PV system at Shanshuilu Eco Park in Nangang

Installing solar PV facilities on public housing rooftops

In order to accelerate the installation of solar PV equipment in public housing in Taipei City, decentralized renewable electricity generation equipment, such as solar PV, are installed dispersedly on the rooftops, walls, or other appropriate spaces of public housing. Priority is given to self-use purposes in order to increase the percentage of self-generated green electricity. As of 2019, the installed capacity of solar PV at public housing in Taipei City was 211.56kW, and this figure is estimated to reach 1,728.7kW by 2030.

Solar PV facilities at Dongming Public Housing

Setting up citizen power plants

Due to the rise of environmental awareness among the public, coupled with the wave of crowdfunding, public- and multiperson-initiated "citizen power plants" began booming in recent years. In order to assist citizens in using renewable energy, the Taipei City Government stocktakes and makes city-owned rooftops available for public use, as well as offers them to civil society organizations to participate in the establishment of demonstration sites for citizen power plants via tender, in hopes of replicating the initiative to a large-area, multi-site model and extending it to private rooftops by providing resource sharing and participation channels through the efforts of the Taipei City Government.

Besides, Taipei City has successfully helped the Xinyi Xincheng Community in Da'an District invest in the establishment of a citizen power plant with a total installed capacity of 145.7kW through consultation and matching provided by the Taipei City Government, thereby setting the precedent for citizen power plant in the City. In the future, Taipei City will continue to stocktake and assess various sites at government agencies and schools in the city that can be used to establish citizen power plants while continuously subsidizing the private sector in setting up solar PV equipment (community-based citizen power plants). Taipei City aims to complete the establishment of 21 citizen power plants on city-owned buildings and land, in order to create a good example of the citizen power plant model.

Community-based citizen power plant in the Xinyi Xincheng Community - the first case in Taipei City

Developing Biomass Energy

Establishing biomass power plants

In order to properly recycle and process food waste in the city (with approximately 170 metric tons recycled every day) and reduce the effect of food waste storage on incineration efficiency in storage pits at incineration plants, Taipei City will plan a food waste-based biomass power plant build-operate-transfer (BOT) project, in which green energy is generated using biogas produced from recycled food waste that undergoes anaerobic fermentation. The biomass power plant will be able to process 200 metric tons of food waste every day, generate a maximum of 12 million kWh of electricity every year, which can be provided to approximately 3,000 households for use, as well as reduce 6,213 metric tons of carbon emissions every year, which is equivalent to the carbon uptake of 16 Da'an Forest Parks.

Taipei City has commissioned professional consulting firms to assess the feasibility of potential sites.

Artistic impression of the anticipated biomass power plant

Continuously Upgrading Reservoir Hydropower and Incinerators

Improving the efficiency of power generation equipment at incineration plants

In order to gradually improve the efficiency of power generation at incineration plants, Taipei City offers incentives for waste-to-energy power generation equipment in compliance with the "Renewable Energy Development Act," so that such equipment will become green power generation equipment during future renovations. From 2017 to 2018, the Beitou Refuse Incineration Plant carried out refurbishment of the steam condensing system; replacement of bag filter-type dust collectors, waste-handling crane systems and ash-handling crane systems; and refurbishment of corroded equipment. From 2017 to 2019, the Muzha Refuse Incineration Plant carried out waste gas treatment and refurbishment and improvement of other facilities; upgrading of catalyst modules at catalytic reaction towers; as well as purchase, replacement and maintenance of the relevant components of the distributed control system (DCS).

Upon refurbishing incineration plants in the improvement projects, Taipei City has fully improved the efficiency of incinerators and the reliability of equipment operation. In addition to optimizing waste gas treatment equipment, reducing air pollutant emissions, refurbishing waste heat utilization equipment and improving waste heat recovery efficiency, Taipei City has also greatly reduced carbon emissions and increased power generation efficiency.

In 2019, the three incinerators generated up to 332.361 million kWh of electricity. In the future, Taipei City will continue to study the methods for efficiency improvement with reference to incineration plant technologies in advanced countries. It is estimated that a total of 310 million kWh of electricity will be generated via incineration power generation in 2022.

Refurbishment of ash-handling crane with a new operation room

Unit sequential control system at the Feitsui Reservoir Power Plant

Promoting the upgrading of the operating components of the Feitsui Reservoir Power Plant to enhance power generation efficiency

In order to make full use of water resources, the Feitsui Reservoir, which is equipped with a hydropower plant with a power generation capacity of 70,000kW, supplies water on a daily basis while generating electricity. The "Operation and Maintenance of the Feitsui Reservoir Power Plant" is routinely carried out every year, while the annual machine maintenance plan and the target value of unit availability are set at the beginning of each year. The annual internal inspection of the power plant and the maintenance of related electrical and hydraulic turbine equipment are carried out according thereto. An evaluation report on the replacement of related equipment in the power is presented upon inspection and testing. Furthermore, considering that some parts of the turbine units may experience increased wear and tear or comprise larger gaps, which will affect their power generation efficiency, an overhaul is carried out once every six to seven years, in which important components and parts are either upgraded or repaired, so as to ensure the reliability and safety of the power generation units. From 2019 to 2030, the Feitsui Reservoir Power Plant aims to maintain an annual electricity generation of over 200 million kWh, while contributing to the reduction of approximately 115,000 metric tons of carbon every year, which is equivalent of the carbon uptake of 385 Da'an Forest Parks in Taipei City, thereby greatly reducing GHG emissions.

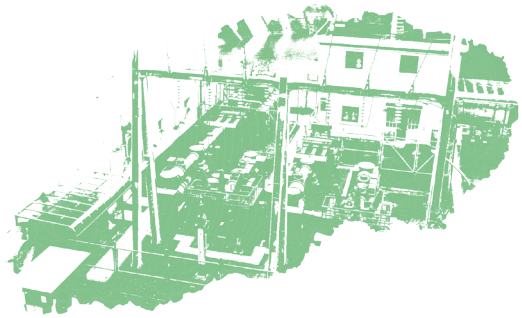
Developing Small and Micro Hydropower Plants and Studying and Analyzing the Feasibility of New Energy Sources, Such as Geothermal Energy and Hydrogen Energy

Collecting technical data related to stream hydropower and exploring suitable power generation sites

Taipei City actively promotes the development of energy saving, energy generation, energy storage and energy reserve in the city in line with the central government's new energy policy. With the easing of central government policies and regulations, small hydropower as a new force are included, in hopes that it will become a part of the decentralized energy network, thereby increasing the proportion of green energy usage in the city. In the future, Taipei City will stocktake the sewage system, tap water system and agricultural irrigation ditches in the city. Experts and scholars will also be invited to conduct on-site surveys to assess the potential and feasibility of installing small hydropower equipment in the city, thereby actively promoting small hydropower equipment in the city. In 2019, Taipei City surveyed a site with potential for electricity generation, whose installed capacity is targeted to reach 5kW by 2030.

As Datunshan District in Taipei City is rich in geothermal potential, Taipei City will seek investments for commercial geothermal power plants in conjunction with the central government's geothermal promotion target, in order to help accelerate the administrative process for establishing such plants. Taipei City aims to achieve an installed geothermal power capacity of up to 10MW by 2030.

Planning and Implementing the Construction of New Smart Energy Infrastructure

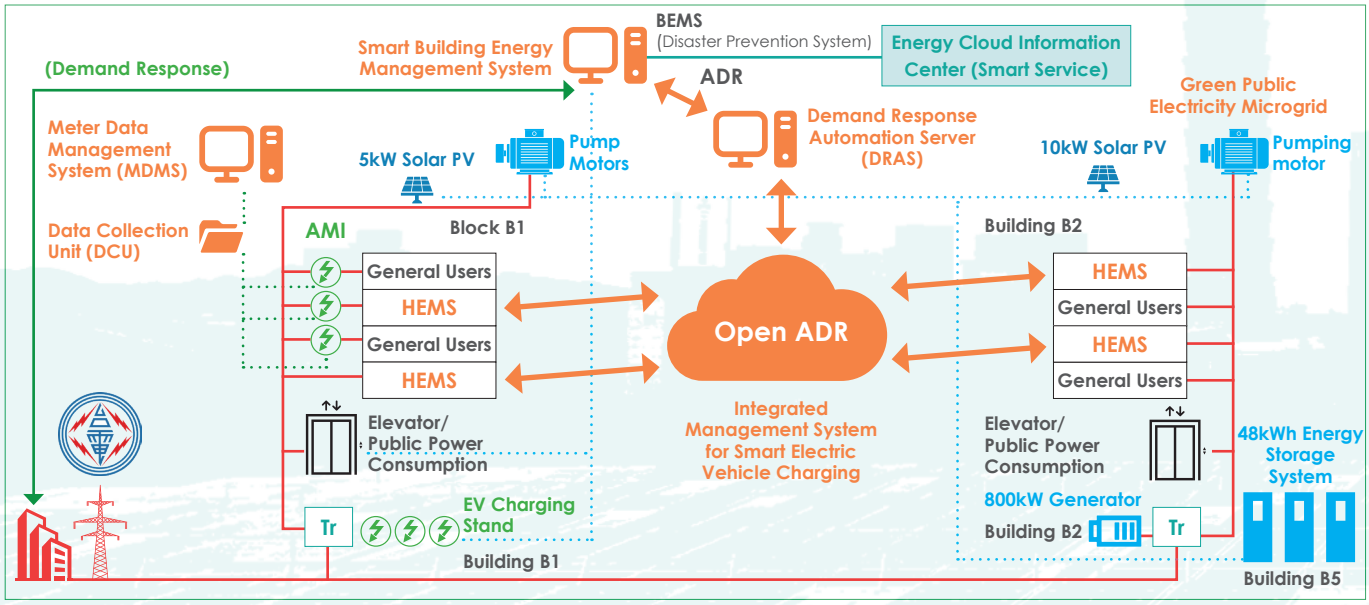


Creating Smart Grid Demonstration Sites

Creating smart public housing areas as demonstration sites

Taipei City integrates green power generation equipment in public housing, existing diesel power generators and electrical equipment in public areas (including EV charging equipment and energy storage systems) together to build a green public electricity microgrid, realizing renewable energy-based electricity generation and storage, electrical equipment control and adjustment, and strengthening electric power backup capabilities in buildings. Besides, this microgrid can also execute demand response together with user groups during peak power usage periods[3], in hopes of saving over 10 percent of energy in normal times and adjusting 20 percent of electricity usage during peak periods through the combination of demand control, equipment unloading and renewable energy storage systems.

As of 2019, a total of five public housing areas have been set up as smart community demonstration sites. Smart grids have been built for 24 households and 301 households in Block 1 and Block 2 of Xinglong Public Housing in Wenshan District. Three types of smart meters (water, electricity, and gas meters) have been installed for 507 households in Jiankang Public Housing in Songshan District, 273 households in Qingnian Public Housing in Wanhua District, and 700 households in Dongming Public Housing in Nangang District. Taipei City aims to set up 54 public housing areas as smart community demonstration sites, catering to a total of 15,880 households, by 2030. Taipei City hopes to expand the use of green energy in buildings, improve the efficiency of public power consumption among residents and their willingness to save electricity through this initiative. In addition, Taipei City can also work in concert with the power company on its demand-side grid adjustment and management measures, and adjust part of power consumption at public housing areas in conjunction with peak electricity usage.



Smart Grid Architecture for Xinglong Public Housing Block 2

Government agencies and schools participating in Taipower's cluster-type demand bidding[4]

To promote smart grid, Taipei City has taken the lead by launching the Taipei City Hall flagship project, which targets a total of 13 government buildings within 1.5 km of Taipei City Hall, to build the Taipei City Hall Smart Grid. An energy management system (EMS) has been set up in various government buildings, while data are collected using a cloud platform for the purpose of power management and control. As of 2019, a total of 13 buildings have been equipped with the system and also participated in Taipower's joint demand bidding. In the future, Taipei City will continue to promote works related to the Taipei City Hall Smart Grid to provide concrete evidence of good power management and control, as well as expand this initiative to 12 administrative districts year by year.

Meanwhile, as of 2019, smart energy saving and green power generation measures have been incorporated in four government agencies and schools, including Zhongzheng Senior High School, Wenlin Elementary School, Taipei Astronomical Museum, and Taipei City Fire Department Baoqiao Station, where a 6kW solar PV system, a 55 kWh energy storage systems, and four sets of power management systems have been installed as demand-side power resources that can participate in Taipower's demand response program.

Note 3: Demand response is a type of service, product, or electricity tariff that prompts users to respond to tariff changes at different times and change their normal electricity usage patterns, or one that offers preferential incentives to reduce electricity use when wholesale electricity prices increase or the electric power system is in emergency.

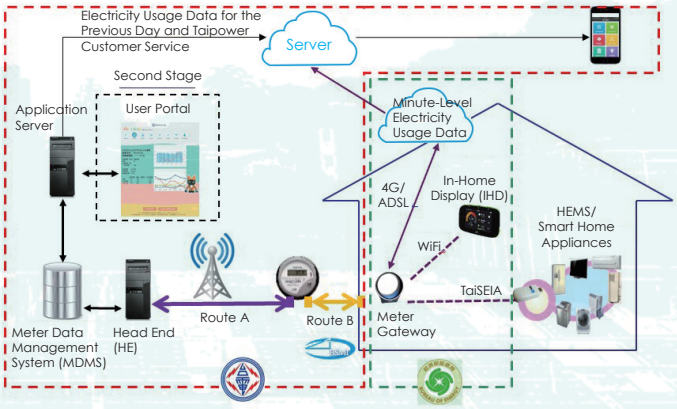
Note 4: Demand bidding refers to a mechanism that enables users to sell the electricity they save back to Taipower during high load in the power system, and to participate in bidding.

Establishing a Smart Energy Management System

Establishing the Small-Scale Regional Energy Management System and Cloud Management Platform

In order to convert scattered and tiny power resources in the metropolitan area to supplementary service resources, such as backup capacity, frequency regulation or voltage adjustment, to assist power company's system dispatchers, Taipei City has established the "Small-Scale Regional Energy Management and Cloud Management Platform" to create a virtual power plant using the concept of user integrator. This cloud platform can perform data collection and remote management of power information and platform maintenance at various sites, collects and stores data from various demonstration sites by means of communication, as well as offers various functions, such as monitoring, query, and data download via visual methods such as web and app. Since it is able to receive real-time control parameters, it can open the remote control to perform the equipment regulating control function.

As of 2019, Taipei City has completed the pilot scheme and established five small-scale regional energy management systems and cloud management platforms. In the future, Taipei City will continue to increase the number of sites that interface with the small-scale regional energy management system and cloud management platform, and aims to interface 50 sites and gradually build a city-level hierarchical smart energy integration platform by 2030, realizing energy autonomy and strengthening power management in the city.



Schematic diagram of Jiankang Public Housing energy visualization

The Small-Scale Regional Energy Management System and Cloud Management Platform

Building smart meters and energy visualization environment for public housing

Taipei City has planned and designed various energy-saving and low-carbon electricity usage and generation equipment for public housing, as well as built a demand-side integrated power monitoring and management network using information, telecommunications, and automation technology, in order to emphasize automation, safety, and close coordination between the demand-side and supply-side. Taipei City connects various data connection devices in buildings to green power generation equipment, electrical equipment, and storage systems, as well as realize functions, such as electricity usage visualization, energy consumption monitoring, electricity scheduling, and smart scenario setting, via human-machine interface, to effectively manage electricity usage in public areas and individual households.

Establishing a campus energy management system

Taipei City has established the campus energy management system for school users in accordance with the "Energy Saving Action for the Residential and Commercial Sectors Jointly Promoted by Counties and Cities" promulgated by the Bureau of Energy, Ministry of Economic Affairs, to measure and analyze the status of energy usage, as well as compile information for management and decision-making purposes. Taipei City calculates the optimal contract capacity through big data analysis and assessment, as well as assist in effective unloading during peak electricity usage in summer, ensuring electricity saving.

Each school with a contract capacity of less than 800kW will receive a subsidy of NT$500,000. As of 2019, Taipei City has approved energy management system subsidies for a total of 24 schools. Taipei City aims to subsidize a total of 237 schools under its jurisdiction to install the system by 2030.

Promoting Shifting of Electricity Demand Spikes

Installing energy storage systems in public housing to perform peak-shaving and valley-filling in electricity usage through charging at night and discharging during peak periods

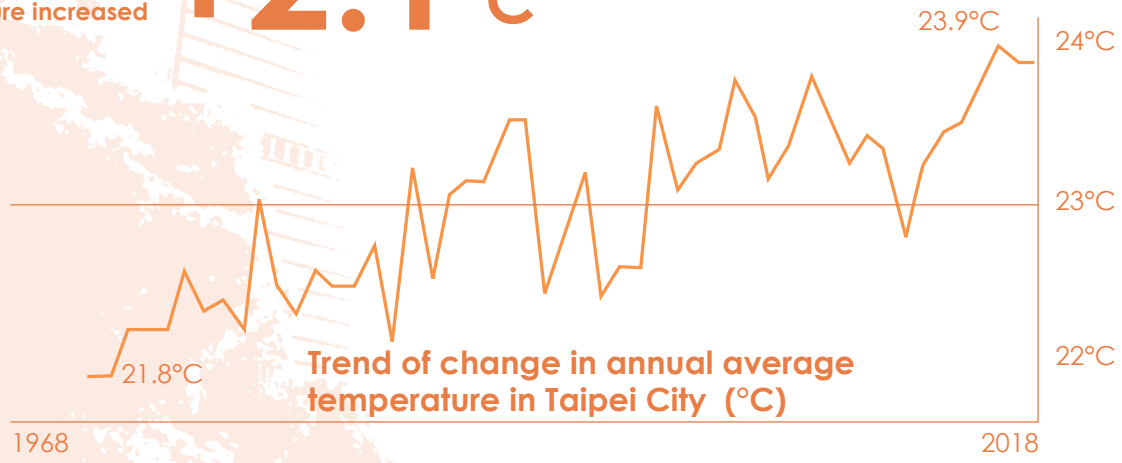
Taipei City installs energy storage systems, combined with the use of renewable energy, in public housing which is equipped with various functions such as power quality maintenance and power consumption regulation. In combination with the existing power grid, this system not only can be used as emergency backup power, but is also able to improve the efficiency of power consumption, as well as perform peak-shaving and valley-filling for electricity usage according to time-of-use tariffs, in order to reduce electricity expenses.

Adapting to Climate Change

As global warming and extreme climate become increasingly severe, the temperature in Taipei City has continued to rise in recent years, and the number of days with high temperatures of over 38°C in summer will increase significantly.
In order to reduce the urban heat island effect, Taipei City has actively promoted the adoption of urban permeable pavement and rainwater storage system, as well as expanded the area of green resources, in hopes of building a sponge city to lower the temperature of Taipei City.

From 1968 to 2018, total annual average temperature increased

+2.1°C



Trend of change in annual average temperature in Taipei City (°C)

Source: Department of Budget, Accounting and Statistics, Taipei City Government

Sustainable Utilization of Water Resources

Promoting Permeable Facilities

Promoting permeable pavements on sidewalks and in parks, parking lots, and campuses

In the past, various public constructions focused on function, convenience, use, and safety as the priority of planning and design, and used high-strength impervious materials as the main materials, thereby resulting in severe urban heat island effect. Therefore, Taipei City promotes the adoption of permeable pavements on sidewalks, park roads, and plazas, so that rainwater can penetrate into roadbed soils through the pavement materials to conserve groundwater. In fine weather, groundwater can also penetrate through the permeable pavements to reduce the temperature of pavements and the urban heat island effect. Moreover, permeable pavements can also prevent water accumulation and provide high-quality walking space. As of 2019, a cumulative total of 139,000 square meters of permeable pavements have been completed on sidewalks, while a cumulative total of 75,000 square meters of permeable pavements have been installed in parks.

For campuses, existing impervious open spaces are adjusted to become grass lawns and flowerbeds, or shrubs and trees are planted, in order to increase the area of green spaces. Also, these spaces are upgraded to permeable flooring, thus enabling rainwater to return to the soil. From 2005 to 2019, a total of 179 campus-times of permeable pavement improvements have been completed, covering an area of 57,359 square meters, such that campus lands can restore their original vitality. In addition, Taipei City has also upgraded permeable pavements by renovating and maintaining parking lots year by year, to replace pavements that were previously made of asphalt, rigid concrete, and epoxy resin, so that rainwater can be conserved or penetrate roadbed soils. As of 2019, a cumulative total of 21,585 square meters of permeable pavements have been laid in parking lots.

Taipei City will build 25,000 square meters of permeable pavements every year, and aims to build a cumulative total of over 610,000 square meters of permeable pavements by 2030.

Permeable pavements on the sidewalks around Tianmu Baseball Stadium

Permeable pavements in Nangang Park

Water Reclamation and Reuse

Rainwater harvesting and storage capacity

In order to build a sponge city, Taipei City has incorporated the principles of runoff allocation and outflow inhibition into the planning and design of park construction and reconstruction. Rainwater harvesting facilities, rainwater gardens, wildlife ponds, and grassed waterways were installed in parks, to increase rainwater infiltration and conserve groundwater sources. Rainwater can be guided into rainwater harvesting facilities in a timely manner when responding to heavy rainfall in a short period of time by allowing the drainage system to discharge road runoff first, reducing the burden on the regional drainage system. At the same time, rainwater can also be recycled and used for planting in parks and watering street trees. On sunny days, rainwater evaporates to adjust microclimates, thus achieving effective use of water resources. As of 2019, rainwater harvesting facilities with a rainwater storage capacity of 1,600 cubic meters have been installed in 27 parks. Taipei City aims to achieve a rainwater storage capacity of more than 6,600 cubic meters by 2030.

A brick-type rainwater harvesting facility in Xiangshan Park

Controlling the Urban Heat Island Effect

Adapting to Microclimates

Increasing the greening coverage of public housing rooftops and installing automatic irrigation systems and establishing a microclimate monitoring system to provide a basis for future improvements

In order to alleviate the increasingly severe heat island effect in the city, Taipei City gives priority to public housing when carrying out planning and design using roof spaces, under the condition that the assessment does not affect the purpose, safety, and appearance of existing spaces, and regulations, as well as sets up automatic irrigation systems, in order to create smart farms on rooftops.

A green-roof vegetable farm in Xinglong Public Housing

Increasing Urban Greening Coverage

Promoting green roofs: Promoting roof greening in public housing to comply with the Self-Governance Ordinance for Green Buildings

According to the "Taipei City Self-Governance Ordinance for Green Buildings," the green area of roof terraces in public housing should reach 50 percent. As of 2019, Taipei City has built green roofs in public housing areas with an area of up to 3,934 square meters. By 2030, roof greening will be completed in a cumulative total of 54 public housing areas, covering an area of up to 38,509 square meters.

Promoting green roofs: Promoting roof planting in schools below general and vocational high school level

As regards the promotion of the "Little Farm Experience Learning and Green Roof Planting Project," Taipei City uses spaces in campuses, such as rooftops and terraces, to cultivate green plants or set up vegetable farms, in order to increase the greening coverage of campuses. At the same time, Taipei City implements farm courses and food and agricultural education, so students can understand the link from the place of origin to the dining table, establish the concept of safe eating, and cultivate awareness toward environmental sustainability, thereby achieving the goal of realizing green campuses and becoming a garden city. As of 2019, Taipei City has set up rooftop gardens in 236 schools, with an estimated green area of 40,167 square meters.

Rooftop farm in Dongming Public Housing

Datun Elementary School (Green-roof little farm)

Shilin Junior High School (Green-roof little farm)

Promoting green buildings: According to the Taipei City Self-Governance Ordinance for Green Buildings, newly-built public buildings shall be awarded a green building label based on the range of construction cost, whereas non-public buildings shall be awarded a green building label based on whether they are high-rise buildings, or the range of increased floor area applied.

In order to promote green buildings, the Ministry of the Interior has established a higher design standard--the "Green Building Labeling System," which is currently only applicable to new public buildings with a total construction cost of more than NT$50 million. Taipei City requires newly-built public buildings with a total construction cost of more than NT$30 million and NT$50 million to obtain a green building label with a green building rating above the pass level and bronze level, respectively, in accordance with the "Taipei City Self-Governance Ordinance for Green Buildings."

As the concept of green building becomes increasingly prevalent and the industrial environment becomes more mature, a green building labeling system should be adopted for new non-public buildings in stages. Considering that new non-public buildings that apply for increased floor area or that are high-rise buildings will consume more energy and affect the carrying capacity of the external environment at all stages of their life cycles, Taipei City requires these buildings to obtain at least a green building label with a green building rating of the pass level, in hopes of improving the effectiveness of energy saving and carbon reduction and creating a healthy ecological environment. According to statistics from 2014 to 2019, green building labels have been issued to a total of 184 construction licenses, to which the "Taipei City Self-Governance Ordinance for Green Buildings" is applicable. Taipei City aims to have up to 690 construction licenses awarded a green building label by 2030.

Diamond-level green building - Beitou Library

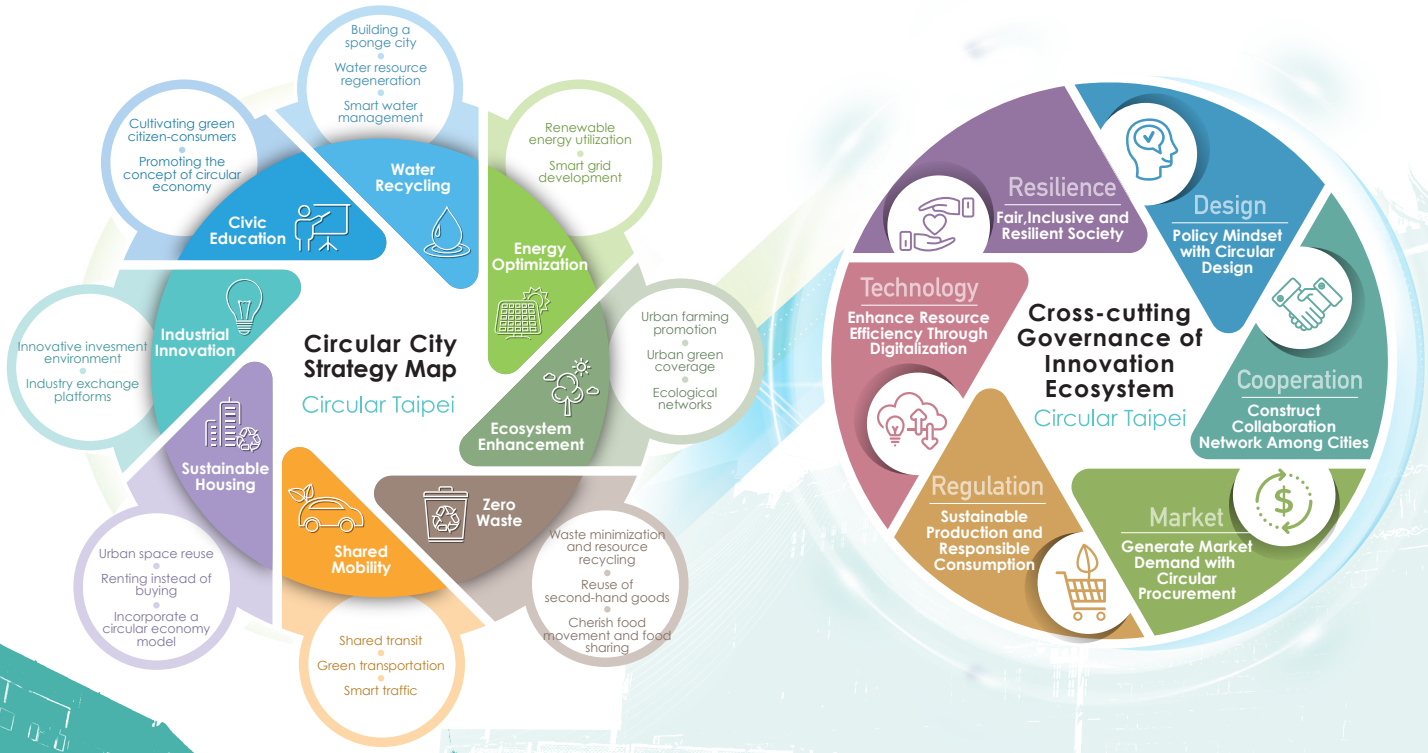
Creating city gardens: Constructing parks and green spaces, as well as greening and beautifying idle, empty public spaces

Parks and green spaces are the "lungs of cities." In order to improve the quality of citizens' living environment and reduce the urban heat island effect, Taipei City actively constructs parks and green spaces throughout the city. In addition to various green resource spaces, such as existing scenic areas, Yangmingshan National Park, Hebin Park, and slopeland conservation areas, the Taipei City Government also actively plants trees and shrubs on safety islands, sidewalks, and spaces under MRT viaducts, in order to connect urban green corridors into a green ecological network. Taipei City also carries out greening and plants edible plants on idle and vacant public spaces, as well as the balconies and rooftops of buildings and schools, through the city's Garden City Promotion Project, building an edible urban landscape. As of 2019, the cumulative area of green spaces in Taipei City was 140.06 million square meters. Taipei City aims to achieve 140.37 million square meters of green spaces by 2030.

Developing a Circular Economy

Taipei City's advantage in economic and technological development, as well as solid infrastructure, combined with Circular Taipei, the governance mindset of circular economy, will be acore competitiveness in building a livable urban life circle with recoverable, renewable, and shared resources, as well as driving industrial innovation and development, thereby moving toward sustainable development in areas such as resources, environment, economy, culture, and society.

The Strategic Framework for Circular Taipei 2.0



Building a Low-Carbon Green Industrial Environment

Promoting the Sustainability Concept of Green Industries

Organizing circular economy forums

To promote the launch of circular economy in the city and be connected with international development trends, Taipei City shares its development experience with international cities through mutual visits and exchanges and by organizing themed forums or trade shows. Mayor Ko led a city government delegation to visit Amsterdam, the Netherlands in 2018, as well as London, England and Hamburg, Germany in 2019, to learn from the experience of other cities, thereby injecting the energy of forward-looking development into the city's circular economy and urban energy policies. At the same time, Taipei City organizes circular economy forums and exhibitions related to industrial exchanges every year, in order to conduct joint discussions and exchanges with country and capital representatives from the UK, Germany, France, the Netherlands, and Denmark, as well as domestic and foreign experts. Moreover, Taipei City markets its achievements in circular economy as a highlight of city diplomacy and establish cooperation platforms to further seek opportunities for cooperation between cities and industries.

Taipei Vision: Developing towards a Circular City International Forum in 2018

Taipei City Mayor led a delegation to visit the Netherlands

Taipei International Water Environment Forum in 2018

Site visits to circular buildings(left : PLACE /Ladywell ; right : Park 20 | 20)

Encouraging Green Procurement to Expand the Green Consumption Market in Taiwan

Organizing briefing sessions and providing on-site guidance and consultation to assist companies in formulating green procurement plans and encourage companies to engage in energy saving and carbon reduction, thereby reducing operating costs and building a circular economy

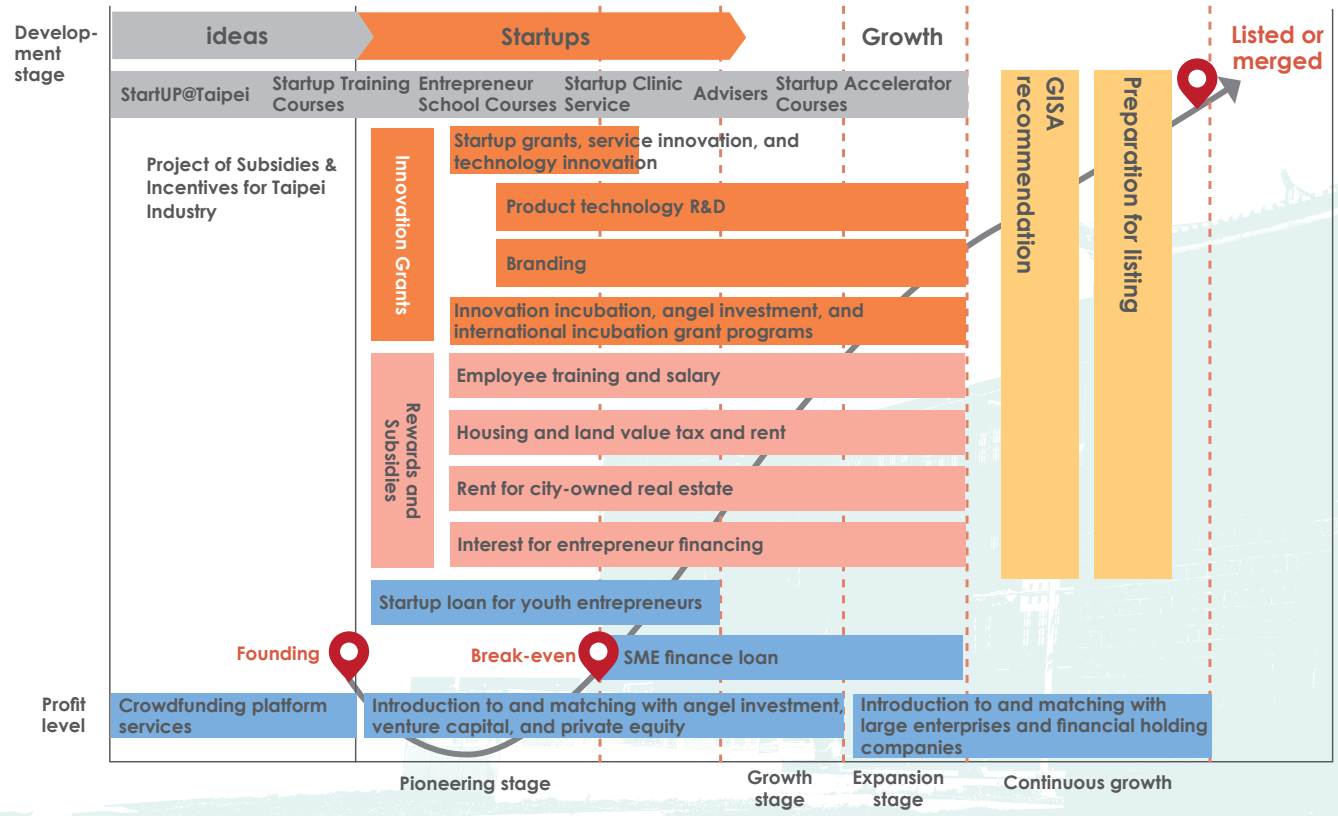
In order to promote the concept of sustainable resource use and resource regeneration, through the government's huge procurement power, priority is given to the purchase of "low-pollution, recyclable, and resource-saving" eco-friendly green products that have less impact on the environment. The Taipei City Government promotes green procurement at government agencies and schools in cooperation with the EPA under the Executive Yuan. Since 2007, Taipei City has started promoting the "Green Procurement Plan for Private Enterprises and Organizations," which is jointly carried out by various units, such as factories, companies, non-profit organizations, hotels, restaurants, hospitals, private schools, religious groups, and community organizations, in order to improve the public's recognition of green consumption and awareness toward eco labels, thereby giving priority to the procurement of eco-friendly products. In 2019, citizens and organizations in Taipei City engaged in green procurement worth up to NT$12.6 billion, with the cumulative amount of green procurement exceeding NT$50 billion so far, which is the highest in Taiwan. It is hoped that this will drive the trend of green consumption and lead private companies to engage in green production. Furthermore, in order to promote the concept of reduction at source and resource recycling, Taipei City has also set up auction markets in Neihu and Wanhua to enable citizens to purchase recycled furniture, as well as created Yanhui Bookstore to extend the life of books and help the disadvantaged, thereby creating new value for waste recycling.

Encouraging the Development of Low-Carbon Green Startup Industries

Rewarding Innovation Investments in Green Industries

Providing rewards and subsidies and various innovation grants for research and development (R&D), branding, incubation, and entrepreneurship in accordance with the "Taipei City Self-Governance Ordinance for Industrial Development," driving innovation investments by private companies to participate in the development of the circular economy industry in the city.

In order to support innovation development in the city's circular economy industry, as well as promote innovative entrepreneurship and seek investments, Taipei City provides investment incentives and subsidies, as well as various innovation project grants for innovation R&D, brand building, angel incubation, and innovative entrepreneurship, in accordance with the "Taipei City Self-Governance Ordinance for Industrial Development," using one-stop service provider StartUP@Taipei. Since its implementation till 2019, a total of 35 companies have been subsidized, amounting to approximately NT$43.19 million in various areas, including green energy building materials, eco-friendly materials, smart energy saving, and sustainable agriculture, which can drive private enterprises to make innovation investments totaling approximately NT$110 million and participate in the development of the circular economy industry in Taipei City.



Stimulating Green Trading and Creating a Green Financial Market

Encouraging government agencies and schools to apply for the renewable energy certificate, in order to drive the development of green energy industry

In response to promoting green trading, Taipei City invigorates the green electricity trading market through "renewable energy certificate[5]." As of 2019, a total of 749 renewable energy certificates have been awarded to six locations, namely Pavilion of Dreams and Pavilion of Future in Xinsheng Park, Shidong Market, Xinglong Market, former site of the Flora Expo Park at the Employment Services Office, and Lihu Elementary School. In the future, such certificates can be traded through a trading platform. Taipei City aims to issue up to 2,400 renewable energy certificates by 2030. In addition, Taipei City collaborates with banks to promote green energy financing to inject green energy funds and provide companies and citizens with a more diverse range of sources for green energy installation, in hopes that the financial sector can support green energy industries and the green economy can drive the development of green finance.

Solar PV equipment at the Pavilion of Future in the Flora Expo Park - the first government agency to receive a renewable energy certificate

Note 5: The renewable energy certificate is proof of electricity generation using renewable energy. This certificate will indicate the source of electricity, the location of electricity generation, and the time of generation.

Complementary Policy Measures (Building an Energy Saving Culture)

- Citizen Engagement
- Energy Map
- Talent Cultivation
- Civic Education

Citizen Engagement

Organizing Energy Policy-Related Forums, Energy Workshops, Citizen Cafes and Briefing Sessions

With regard to citizen engagement in issues related to renewable energy, it is important to provide a friendly environment; communicate with citizens through cooperation platforms, as well as public engagement and dialogue; and organize events such as energy workshops and citizen cafes, in order to encourage citizens to actively discuss new opportunities for the use of green energy and expand citizens' engagement in renewable energy. Since drafting the Taipei City Energy Policy White Paper in 2018, a total of four professional consultant and committee member consultation meetings have been convened, thus laying the foundation for citizen engagement in the possible development direction and promotion strategies of the city's policy in the future. The three major directions for promoting the policy include deepening public awareness, expanding citizen engagement platforms, and establishing resource connection platforms.

On the promotion of citizen engagement, years 2019 and 2020 have been set as the "environment-building period," where the main focus is to drive the idea of public engagement and establish a normative platform via community empowerment using various approaches such as energy workshops and citizen cafes, so as to gather consensus and action trends associated with citizen engagement in energy. On the other hand, years 2020 to 2022 will serve as the "promotion-enhancing period," where the main focus is to establish complete channels and resource connections. Taipei City will establish a citizen power plant resource platform, combined with corporate resources and space, in order to assist in the establishment and utilization of citizen power plants, as well as achieve corporate obligations. Besides, Taipei City will also assist citizens in participating in energy activities. Years 2022 to 2030 will serve as the "promotion-deepening period," with the goal of expanding the power of civic engagement and completing 21 citizen power plants.

Deepening public awareness

Use demonstration cases to enhance community empowerment and raise public awareness, as well as conduct proposal simulation activities to express community issues based on power plant revenue.

Expanding citizen engagement platforms

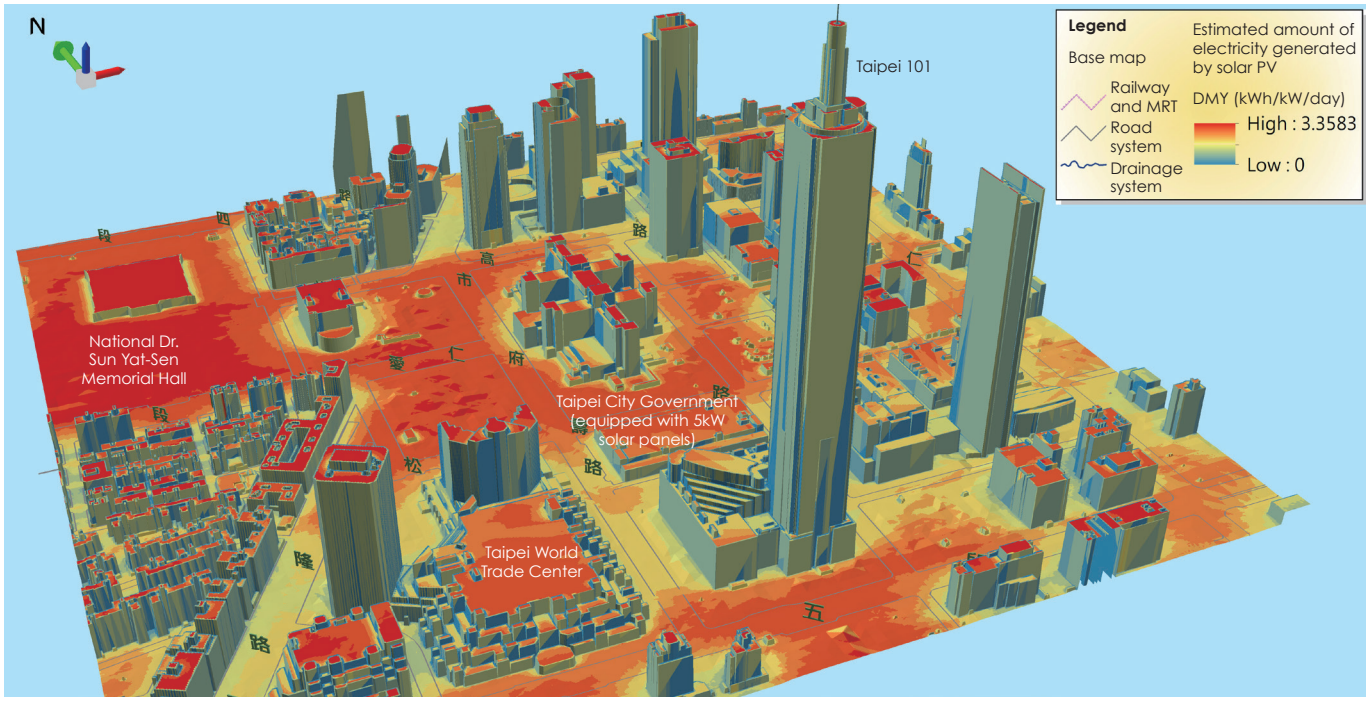
Establish a regular communication platform to address issues related to citizen engagement in energy, using various approaches such as organizing awareness and briefing events, energy workshops, and citizen cafes, so as to connect to citizens' concerns and views on energy and provide opportunities for expressing and stimulating ideas.

Establishing resource connection platforms

Link and integrate various resources: Combine CSR resources from companies and people's needs, as well as continue to stocktake public spaces and make them available to organizations that are interested in setting up citizen power plants.

Energy Map

Creating Energy Maps Using Big Data Analysis

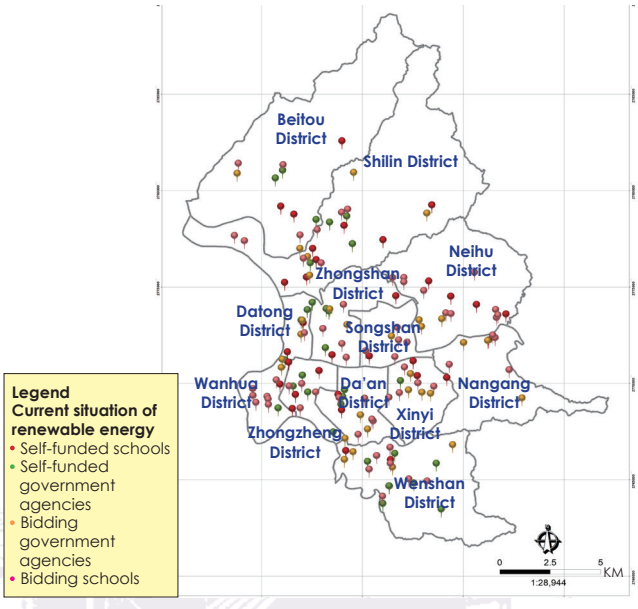


Taipei City Government Special District Solar PV Potential Grading Map

In order to master the urban energy distribution and enhance the people's autonomy in energy planning, Taipei City fully discloses the current energy situation and potential hot spots in the city by visualizing energy information, in order to provide a reference for energy strategy planners, manufacturers, and the public who want to build energy facilities, as well as increase their willingness to participate in setting up such facilities. Besides, the city's scientific decision-making with regard to renewable energy infrastructure planning can be improved using the information integration capability of the energy map, thereby speeding up energy promotion and increasing decision-making accuracy.

Taipei City has established the "Taipei City Renewable Energy Resources Information System," which includes maps of various themes, such as the current status of solar PV installation for public-owned real estate tenders, the distribution of electricity generation at self-funded PV sites in Taipei City, the distribution of major electricity consumers in Taipei City, the distribution of geothermal resources, and the distribution of average wind speed at a height of 10m. For industries, Taipei City has also launched the initiative for hot spots, including demonstration areas such as the Taipei City Government Special District, Neihu Technology Park, Nangang Business Park, Shezi Island, and Beitou-Shilin Technology Park, as well as creating the "3D Solar Power Generation Potential Grading Map" with a spatial resolution of 1m x 1m, in order to disclose information on solar PV potential areas or sites in the demonstration areas located in Taipei City.

In the future, Taipei City will expand the use of the 3D Solar Power Generation Potential Grading Map, and create at least one solar power generation potential grading map in each administrative district, and also create thematic maps for wind energy and geothermal energy with grid capacity. In 2019, the map has been created for five administrative districts, with the number of administrative districts having such maps increasing year by year. By 2030, all the administrative districts will have such maps. In this way, urban energy data can be made available, which will then drive the participation of the government and the system, direct or transfer energy suppliers, and the citizens, thereby facilitating the promotion of a national energy autonomy system.



Current situation of solar PV installations for city-owned real estates in Taipei City

Talent Cultivation

Conducting Energy-Saving Training for Energy Managers in Charge of Energy Users in the Industrial and Commercial Sectors with Electricity Contract Capacities below 800kW

Energy management staff training

In order to assist energy users, which are specified in Article 8 of the Energy Administration Act, in Taipei City and develop technical skills related to energy saving management in energy users with electricity contract capacities below 800kW with Taipower, Taipei City has planned a series of courses related to energy saving and carbon reduction for factories, businesses, offices and other places where electricity is used,. so as to nurture designated personnel in energy management and assist energy users in planning energy saving and carbon reduction, so that industrial and commercial companies implement energy saving and carbon reduction, thereby achieving the purposes of reducing energy expenditure and improving energy efficiency.

The energy saving and carbon reduction training classes for energy managers will compile the reasons as to why businesses fail to implement energy saving when carrying out energy-saving improvements as discussed during on-site guidance and energy saving and carbon reduction seminars. Besides, Taipei City also proposes corresponding courses that can truly comply with the implementation of energy saving in various sectors, while providing industry and business owners with current energy saving-related laws and regulations, enriching new energy saving technologies and energy management regulations, and enhancing energy self-management capabilities in the industrial and commercial sectors.

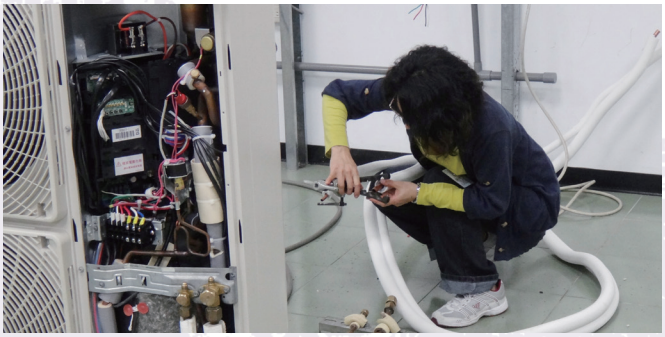
From 2011 to 2019, the cumulative number of energy managers that have undergone the Taipei City Industrial and Commercial Energy Management Staff Training Course was 1,209 person-times. Considering the energy manager training capacity in the city, Taipei City aims to achieve a target number of energy managers trained totaling to 60 person-times per year in the future.

Conducting Energy-Saving and Eco-Friendly Refrigeration and Air-Conditioning Services/Energy Saving-Related Courses for Community Property Managers

The Taipei City Vocational Development Institute (VDI) under the Department of Labor, Taipei City Government is the only vocational training institution for water, electricity, refrigeration, and air-conditioning services, as well as the national test site for Level B and C technicians in North District. Courses related to energy-saving and eco-friendly refrigeration and air-conditioning are conducted every year to provide the unemployed with competency (or pre-employment) training courses and advanced competency training courses, so as to improve the development of energy-related talents in Taipei City and establish a green energy talent chain, thereby meeting companies' demand for technical talents. From 2014 to 2019, the cumulative number of talents related to energy-saving and eco-friendly refrigeration and air-conditioning trained by VDI was 404 person-times. Considering the refrigeration and air-conditioning vocational training capacity at VDI in the city, Taipei City aims to achieve a target number of energy-saving and eco-friendly refrigeration and air-conditioning talents trained totaling 70 person-times per year in the future.

Additionally, Taipei City nurtures green property managers to become the seeds of energy saving and carbon reduction in the community, in order to convey the concept of energy saving and carbon reduction and assist communities in reviewing and implementing low-carbon management. Therefore, Taipei City plans training courses for green property managers and train 60 person-times each year, in order to strengthen the professional knowledge and concept of low-carbon community transformation among property managers. The content of these training courses not only include environmental greening, resource recycling, and electricity saving in life, but also promotes and explains information related to energy saving and carbon reduction subsidies in Taipei City, in hopes of getting more communities to participate in energy saving and carbon reduction measures, thereby jointly creating a sustainable development environment in Taipei City.

Energy-saving and eco-friendly refrigeration and air-conditioning course



Civic Education

Educating the General Public about Energy and the Concept of Green Consumption by Setting Up Booths in Various City Government Events

As global environmental issues become increasingly severe, implementing green consumption and living have currently become an important environmental protection issue. In view of the contributions of social education, Taipei City carries out green consumption and living training and promotion in collaboration with companies, organizations, communities, villages or schools, in order to nurture environmental citizens and environmental learning communities. Promotional activities are mainly targeted at 12 administrative districts and 456 villages in Taipei City. Personnel can be sent to villages when local village or neighborhood chiefs organize village meetings or gatherings, or when organizations, such as community building management associations and community development associations, organize assemblies. The themes of these promotional activities mainly revolve around green living, green consumption, and green procurement, to provide the right concept of green consumption and encourage the implementation of green procurement.

As of the end of 2019, the cumulative number of people participating in green consumption education and awareness activities was 349,000 person-times. In the future, Taipei City will continue to conduct related activities and courses, in order to make the public aware of green living through environmental education, reduce resource waste, and lessen environmental impact, thereby achieving the purpose of promoting green consumption.

Green consumption awareness activity

A talk on green consumption and environmental protection in life

Incorporating the Concept of Energy Education into Teaching and Promoting It at Elementary Schools, Secondary Schools and Community Colleges

Since 2016, Taipei has been promoting the "Little Farm Experience Learning Project" to introduce farming experience and green campus to schools, so that students can participate in creating the landscape of a little campus farm. In addition to the implementation of farming experience, Taipei City has also promoted projects, including the Green Campus (solar panels, green planting, energy saving and carbon reduction), the Smart Campus (digital management such as power improvement and contract capacity), as well as cooling facilities and equipment (e.g., green walls, sprinkler cooling systems, and improvement of shading facilities), based on the mindset of green campus, which can guide students to reflect on the relationship between humans and the environment in combination of life contexts, thereby forming active environment protection actions and implementing the concept of energy saving and sustainable environment.


Experiential education on the green roof at Shilin Junior High School

Development Indicators

Energy Saving and Carbon Reduction

Strategy: Improving Energy Efficiency to Achieve a Low-Carbon Model

Promoting and subsidizing the replacement of old lighting fixtures in schools
97,563 units in 2019
817,563 units in 2030

Promoting and subsidizing schools in replacing old and non-energy-saving air conditioners
5,615 units in 2019
12,015 units in 2030

Providing guidance on energy saving to government agencies and schools in Taipei City
14.37 million kWh in 2019
27.66 million kWh in 2030

Subsidizing communities in energy-saving renovations and replacing energy-consuming equipment in public spaces
497 units in 2019
1,267 units in 2030

Providing guidance on energy saving and carbon reduction to the residential and commercial sectors
123.48 million kWh in 2019
343.48 million kWh in 2030

Strategy: Promoting Low-Carbon Transportation

Promoting the use of public bicycles
28.46 million person-times per year in 2019
33 million person-times per year in 2030

Promoting electric public buses
22 buses in 2019
3,500 buses in 2030

Promoting car sharing
500 cars in 2019
1,500 cars in 2030

Promoting scooter sharing
10,337 scooters in 2019
20,000 scooters in 2030

Promoting shared parking spaces
2,495 parking spaces per year in 2019
3,000 parking spaces per year in 2030

Developing Diverse Energy Sources

Strategy: Developing a Decentralized Energy Network

Promoting the installation of ground and rooftop solar PV equipment
28.93MW in 2019
50MW in 2030

Setting up citizen power plants
Announcement in 2019
21 power plants in 2030

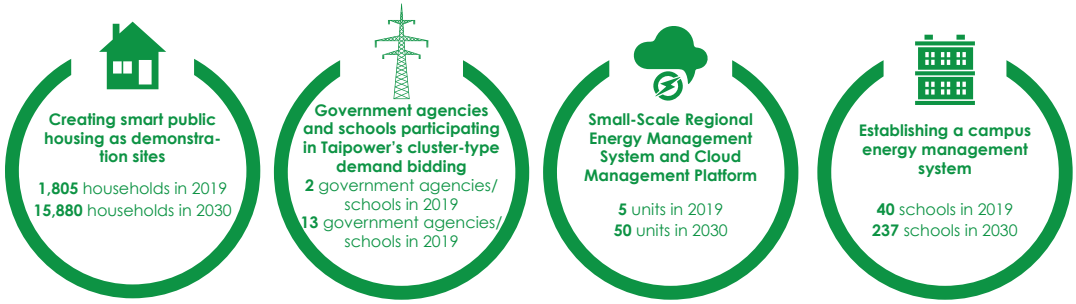
Establishing biomass power plants
Feasibility assessment and tender in 2019
12 million kWh per year in 2030

Improving the efficiency of power generation equipment at incineration plants
330 million kWh per year in 2019
310 million kWh per year in 2030

Enhancing the electricity generation efficiency of the Feitsui Reservoir Power Plant
200 million kWh per year in 2019
200 million kWh per year in 2030

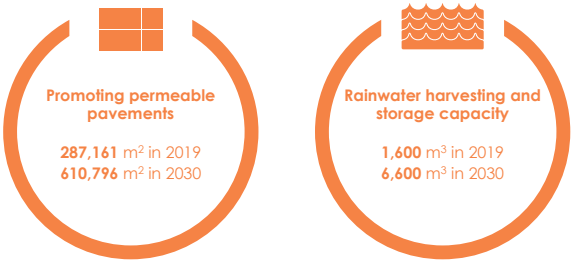
Developing Diverse Energy Sources

Strategy: Planning and Implementing the Construction of New Smart Energy Infrastructure



Adapting to Climate Change

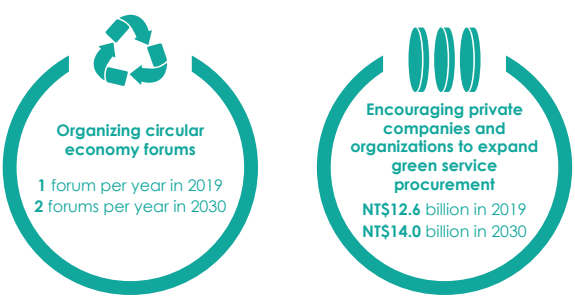
Strategy: Sustainable Utilizationof Water Resources



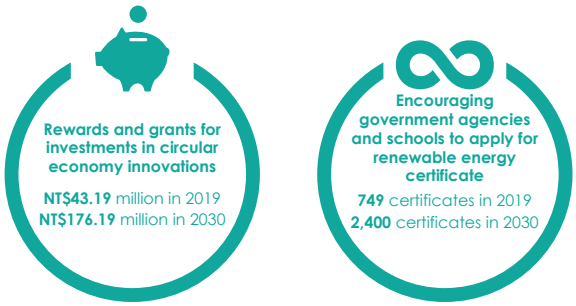
Strategy: Controlling the Urban Heat Island Effect

Developing a Circular Economy

Strategy: Building a Low-Carbon Green Industrial Environment



Strategy: Encouraging the Development of Low-Carbon Green Startup Industries



Note: 2019 numbers indicate actual performance; 2030 numbers indicate the estimated target.

List of Measures

Energy Saving and Carbon Reduction

Improving Energy Efficiency to Achieve a Low-Carbon Model

Promoting energy-saving improvements at government agencies and schools	· Subsidizing schools in replacing old lighting fixtures. · Subsidizing schools in replacing old and non-energy-saving air conditioners. · Providing guidance on energy saving to government agencies and schools.
Promoting energy efficiency improvement in the residential, commercial, industrial, and agricultural sectors by providing free guidance and replacement subsidies	· Providing guidance on energy saving and carbon reduction to the residential and commercial sectors. · Guiding districts and villages to participate in low-carbon accreditation. · Subsidizing communities in energy-saving renovations and replacing energy-consuming equipment in public spaces.

Promoting Low-Carbon Transportation

Planning to build a complete bicycle road network and connecting it with public transportation to increase people's willingness to use bicycles after taking public transportation.	· Carrying out the public bicycle promotion program. · Promoting the unlimited public transport card.
Building an electric vehicle-friendly environment	· Installing charging ports at public parking lots. · Reserving space for installing charging equipment wiring in new buildings.
Promoting green energy transportation	· Promoting electric public buses.
Promoting shared transportation	· Promoting the car sharing program. · Promoting the scooter sharing program. · Promoting the parking space sharing program.

Developing Diverse Energy Sources

Developing a Decentralized Energy Network

Promoting the installation of solar energy systems on the rooftops of government agencies and schools and in the private Sector	· Promoting the installation of ground and rooftop solar PV equipment. · Subsidizing the private installation of solar PV. · Installing solar PV facilities on public housing rooftops. · Setting up citizen power plants.
Developing biomass energy	· Establishing biomass power plants.
Continuously upgrading reservoir power generation and incinerators	· Improving the efficiency of power generation equipment at incineration plants. · Promoting the upgrading of the operating components of the Feitsui Reservoir Power Plant.
Developing micro hydropower plants and conducting research on the feasibility of new energy sources	· Collecting technical data related to stream hydropower and exploring suitable sites.

Planning and Implementing the Construction of New Smart Energy Infrastructure

Creating smart grid demonstration sites	· Creating smart public housing areas as demonstration sites. · Government agencies and schools participating in Taipower's cluster-type demand bidding.
Establishing a smart energy management system	· Establishing the Small-Scale Regional Energy Management System and Cloud Management Platform. · Building smart meters and energy visualization environment for public housing. · Establishing a campus energy management system.
Promoting shifting of elecctricity demand spikes	· Installing energy storage systems in public housing to perform peak-shaving and valley-filling in electricity usage through charging at night and discharging during peak periods.

Adapting to Climate Change

Sustainable Utilization of Water Resources

Promoting permeable facilities	· Promoting permeable pavements on sidewalks and in parks, parking lots and campuses.
Water reclamation and reuse	· Rainwater harvesting and storage capacity.

Controlling the Urban Heat Island Effect

Adapting to microclimates	· Increasing the greening coverage of public housing rooftops and installing automatic irrigation systems, as well as establishing a microclimate monitoring system to provide a basis for future improvements.
Increasing urban greening coverage	· Promoting green roofs: Promoting roof greening in public housing to comply with the Self-Governance Ordinance for Green Buildings. · Promoting green roofs: Promoting roof planting in schools below general and vocational high school level. · Promoting green buildings: According to the Taipei City Self-Governance Ordinance for Green Buildings, newly-built public buildings shall be awarded a green building label based on the range of construction cost, whereas non-public buildings shall be awarded a green building label based on whether they are high-rise buildings, or the range of increased floor area applied. · Creating city gardens: Constructing parks and green spaces, as well as greening and beautifying idle, empty public spaces.

Developing a Circular Economy

Building a Low-Carbon Green Industrial Environment

Promoting the sustainability concept of green industries	· Organizing circular economy forums.
Encouraging green procurement to expand the green consumption in Taiwan	· Organizing briefing sessions and providing on-site guidance and consultation to assist companies in formulating green procurement plans and encourage companies to engage in energy saving and carbon reduction, thereby reducing operating costs and building a circular economy.

Encouraging the Development of Low-Carbon Green Startup Industries

Rewarding innovation investments in green industries	· Providing rewards, subsidies, and innovation grants to green industries in Taipei City to drive private companies to make innovation investments and participate in industrial development in a circular economy.
Stimulating green trading Creating a green financial market	· Encouraging government agencies and schools to apply for renewable energy certificate, in order to drive the development of green energy industry.

Complementary Policy Measures

Citizen Engagement	· Organizing energy policy-related forums, energy workshops, citizen cafes and briefing sessions.
Energy Map	· Creating energy maps (including solar energy, wind energy, geothermal energy and grid capacity maps) for Taipei City using big data analysis.
Talent Cultivation	· Conducting energy saving training for energy managers in charge of energy users in the industrial and commercial sectors with electricity contract capacities below 800kW. · Conducting energy-saving and eco-friendly refrigeration and air-conditioning services/energy saving-related courses for community property managers.
Civic Education	· Educating the general public about energy and the concept of green consumption by setting up booths in various city government events. · Incorporating the concept of energy education into teaching and promoting it at elementary schools, secondary schools and community colleges.

Toward a Low-Carbon, Green Energy and Sustainable City

Saving · Efficiency · Innovation

Creating an Energy-saving Culture. ——

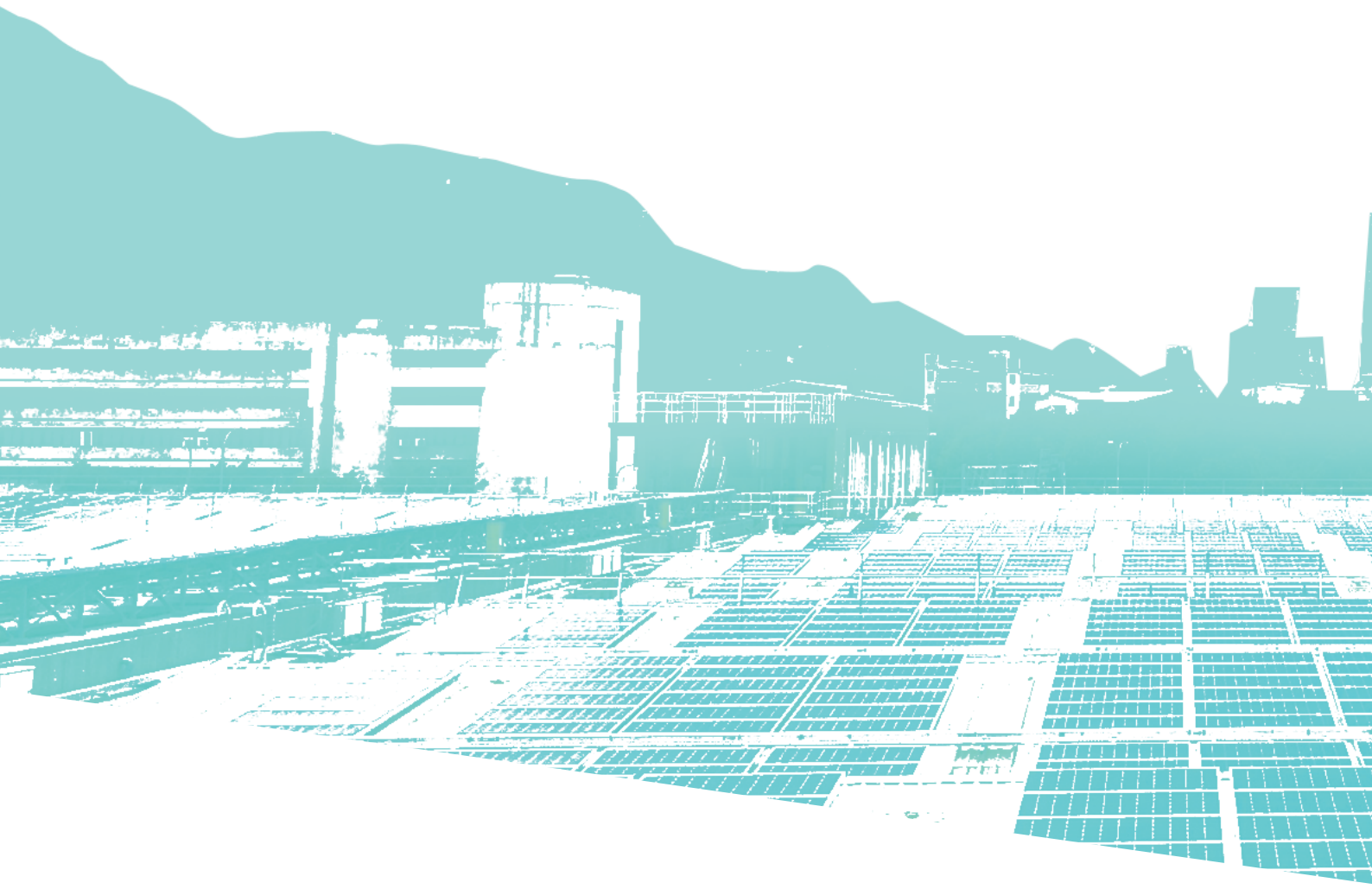
Promoting Low-carbon Energy Transition. ——

Building a Resilient, Adjustable and Livable Environment. ——

Injecting Energy into Green Economy Innovation and Development. ——

Taipei takes the lead by engaging in dialogues with citizens, linking up with the world, and moving toward the vision of a green capital and circular city, thereby leading Taiwan toward sustainable development goals.

In the future, Taipei City will formulate a longer-term vision and goals for 2050, standing shoulder to shoulder with international cities and face the responsibilities for climate change and the challenges of energy tran-sition together.



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