Southern Taiwan Science Park Bureau,
National Science and Technology Council

2022

Southern Taiwan Science Park Voluntary Department Reviews

Content

Message from the Director-General

In 2022, Southern Taiwan Science Park Bureau (STSP) once again demonstrated its strength and resilience that impressed all. Boosted by the strong performance of the semiconductor industry, the turnover reached NTD 1483.374 billion, with an increase of 35.48%, and the number of employees was 92,601, an increase of 8,551 compared with 2021. The semiconductor cluster in Southern Taiwan continues to grow and thrive, and the major international manufacturers keep increasing their investment. A complete advanced semiconductor cluster has been constructed, which plays a role of the locomotive of the high-tech industries in Southern Taiwan and drives the economic revitalization of the surrounding areas.

To reserve industrial land and spread the effect of the mature industrial cluster of STSP, the Chiayi Science Park and Pingtung Science Park Preparatory Projects were approved in January, 2022 by the Executive Yuan. With Tainan and Kaohsiung as the core, Chiayi in the north, and Pingtung in the south, the entire cluster assists with the value-adding of the local industries, promoting the cross-domain innovation, driving the talent circulation and investment attraction, constructing a science and technology corridor in Southern Taiwan and strengthening the regional economic resilience.

STSP is committed to high-standard sustainable actions. In 2022, STSP took the lead in introducing reclaimed water into the science park. With the first reclaimed water plant of the semiconductor industry (TSMC Southern Taiwan Science Park Reclaimed Water Plant) and the Anping, Yongkang, and Rende Reclaimed Water Plants, expected in 2030, the final daily water supply can reach more than 93,000 tons per day, accounting for about 30% of the total water use in Tainan Science Park. In the future, diverse water sources will continue to be promoted to strengthen the stability of water use.

In addition to the high-quality workplace and a sustainable environment, high-quality life is also needed. In 2022, a non-profit preschool was opened in STSP, and there were as many as 50 couples in total, the highest number ever, held their group wedding at STSP. Gender-friendliness, workplace equality, and optimization of the working environment are also actively promoted in STSP. Moreover, various arts and cultural events, sports events, and other activities are also organized to help the employees strike a balance between work and life for their physical and mental health.

Looking into the future, STSP will continue to introduce academic research technologies to enrich the R&D capacity of the science park and create a new-generation science park that is exquisite, diverse, high-quality, energy-saving and sustainable so as to consolidate the competitive advantage of Taiwan's semiconductor industry. We aim at completing the new park expansion projects as scheduled with quality to gradually implement the 2023 technology vision of "innovation, inclusiveness, and sustainability" and the Net Zero Emissions Policy by 2050.

Director-General

蘇振綱

Executive Summary

The establishment of the Southern Taiwan Science Park (referred to as STSP) is aimed to facilitate the development of high-tech industries in Southern Taiwan, construct complete software and hardware public facilities, and provide high-quality investment environment to attract domestic and foreign manufacturers. Southern Taiwan Science Park Bureau, National Science and Technology Council (referred to as STSPB) attaches great importance to the integration of the four values of "Production, Living, Ecology, and Life" in the promotion of STSP to become a sustainable green park. In addition, STSPB also helps achieve the country's sustainable development goals. With the reference to Taiwan's Sustainable Development Goals (T-SDGs), the blueprint for the sustainable development of the STSP has been drawn. The visions of the sustainable development of STSP is "Generating the kinetic energy in the park, Expanding the industrial cluster, Lean and high-quality services to ensure sustainable operation, Creating a friendly environment and Attaching importance to the value of Production, Living, Ecology, and Life".

Relevant promotion work is carried out by the Environment and Labor Affair Division, which serves as the overall planning unit for the voluntary review report (VDR) of the sustainable development. Through the business inventory of all units, combined with the results of the questionnaire survey of stakeholders and senior executives in charge of decision-making, it was found in the comprehensive review of STSPB's various policies that specific contributions have been made in the cultivation resources in T-SDGs (1), economic development (4, 8, 17), environmental management (6, 12), renewable energy (7), urban and rural development (11), and climate action (13). STSPB's sustainable visions correspond to the major core goals of T-SDGs 1, 4, 8, 17, 6, 12, 7, 11, and 13. The Environment and Labor Affair Division and the ESG Editing Team handled the staff work and based on the results of identification mentioned above, the 5 major promotion directions and 17 major policy axes were formulated.

Material Goal	Linkage between the administration axes and the core goals
Strengthen social care services and economic security for the disadvantaged	• Assist manufacturers with R&D and innovation, foster startup teams, and accumulate the momentum for technical innovation in the park • Expansion of the Park Area • Driving Urban Transformation • Promoting Local Employment

Material Goal	Linkage between the administration axes and the core goals
Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all **Promote sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all**	◉ Key cultivation to reduce the gap between the industry and the academia ◉ Promote Technological Upgrading Expand Industrial Clusters ◉ Construction of a Safe and Friendly Workplace Environment

Material Goal	Linkage between the administration axes and the core goals
Establish diversified partnerships and work together to advance the vision of sustainability	◉ Domestic and Foreign Exchanges and Industrial Links ◉ Joint Participation in International Exhibition

Material Goal	Linkage between the administration axes and the core goals
Ensure environmental quality and sustainable management of environmental resources **Ensure sustainable consumption and production patterns**	◉ Implement environmental reviews 100% of wastewater and sewage is included in sewage pipeline ◉ Reduce water intensity in the park and improve stability of water supply ◉ Proper Treatment of Waste

Material Goal	Linkage between the administration axes and the core goals
Ensure access to affordable, reliable, sustainable, and modern energy for all	◉ Installation of Renewable Energy Systems to stabilize power supply in the park

Material Goal	Linkage between the administration axes and the core goals
Make cities and human settlements inclusive, safe, resilient and sustainable	◉ Construction of a stable and convenient transportation system ◉ Complete the park functions to create a LOHAS art and culture in STSP ◉ Low-carbon ecological communities and buildings for environmental symbiosis and mutual benefit ◉ Spreading awareness of ecological

Material Goal	Linkage between the administration axes and the core goals
Take urgent action to combat climate change and its impacts	◉ Intelligent disaster prevention response system to improve the resilience of the park area ◉ GHG Management

This Report was compiled based on the blueprint for the sustainable development of the STSPB, the organizational structure and promotion mechanism, major contribution core goals and promotion results, and future prospects, and with the major core goals in the sequence of 1, 4, 8, 17, 6, 12, 7, 11, and 13 that correspond to the sustainable development visions, coupled with the explanation of the relevant implementation content and promotion results of the policy axes, the process of STSPB's contribution in the assistance with the promotion of T-SDGs is systematically presented.

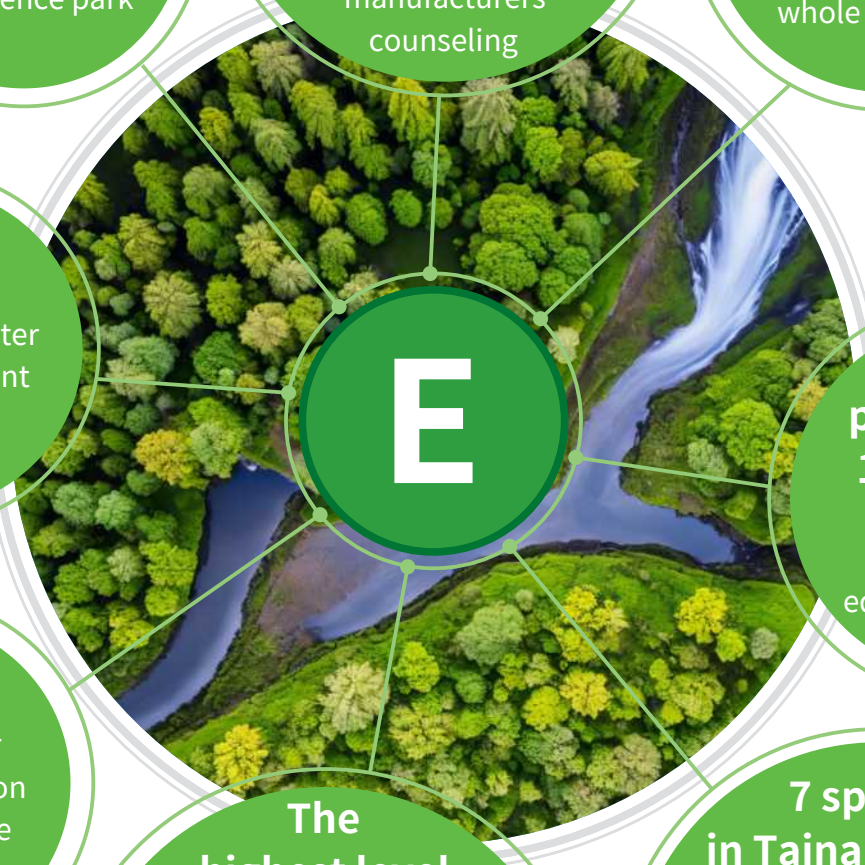
Highlights of Performance in 2022

Environment

Energy conservation 6 business units
Water conservation 5 business units
Provided park manufacturers counseling

93.19%
The reuse rate of the industrial waste in the science park

18,280,900 liters
The total amount of water recovered in the whole park area



100%
Discharged water met the Effluent Standards

405 participants 14 sessions
Organized environmental education courses

4.29 MW
Installed solar power generation system with the capacity

The highest level of Diamond Grade EWH-EC Green Building Mark
Kaohsiung Science Park obtained the renewal of the label of Ecological Community Evaluation System (EEWH-EC)

7 species in Tainan Science Park
8 species in Kaohsiung Science Park
The birds observed are the protected birds announced by the Council of Agriculture

Social

48 groups 951 people
A total of domestic and foreign visitors visited STSP

7 sessions
Carried out a total of shows in Xingan Community Culture Museum

2 sessions 46 manufacturers participated
Organized “Workplace Equality and Sexual Harassment Prevention Seminar”

100%
Overall health service rate of the science parks within STSP

77 sessions, with an accumulative of 1,583 trainees.
Occupational disaster simulation education and training

80 sessions
of on-site Counseling of Occupational Safety and Health

986 sessions
Carried out of labor inspections (including occupational safety and health inspections and working conditions inspections)

Governance

Reached 272
The cumulative validly approved manufacturers

NTD 1.483374 trillion, a 35.48% increase
The annual turnover of STSP

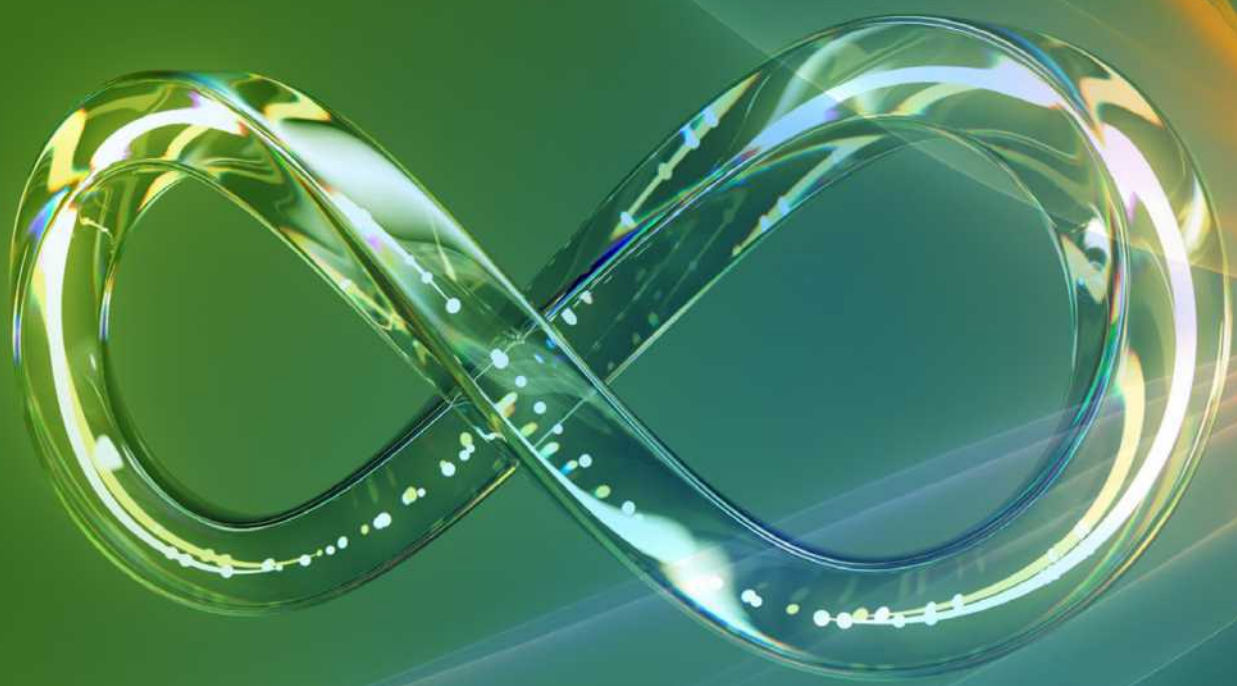
30 new manufactures NTD 55.807 billion
The investment amount

6,864 hours 42 hours/person
The total training hours of the STSPB staff

Opening of New Shopping Mall at Management 1 Zone at the KSP,
increasing the convenience of life for employees in the park

1 session More than 100 participants
anti-corruption and integrity education

Sustainable Development Roadmap



1. Vision(Establishment Purpose)

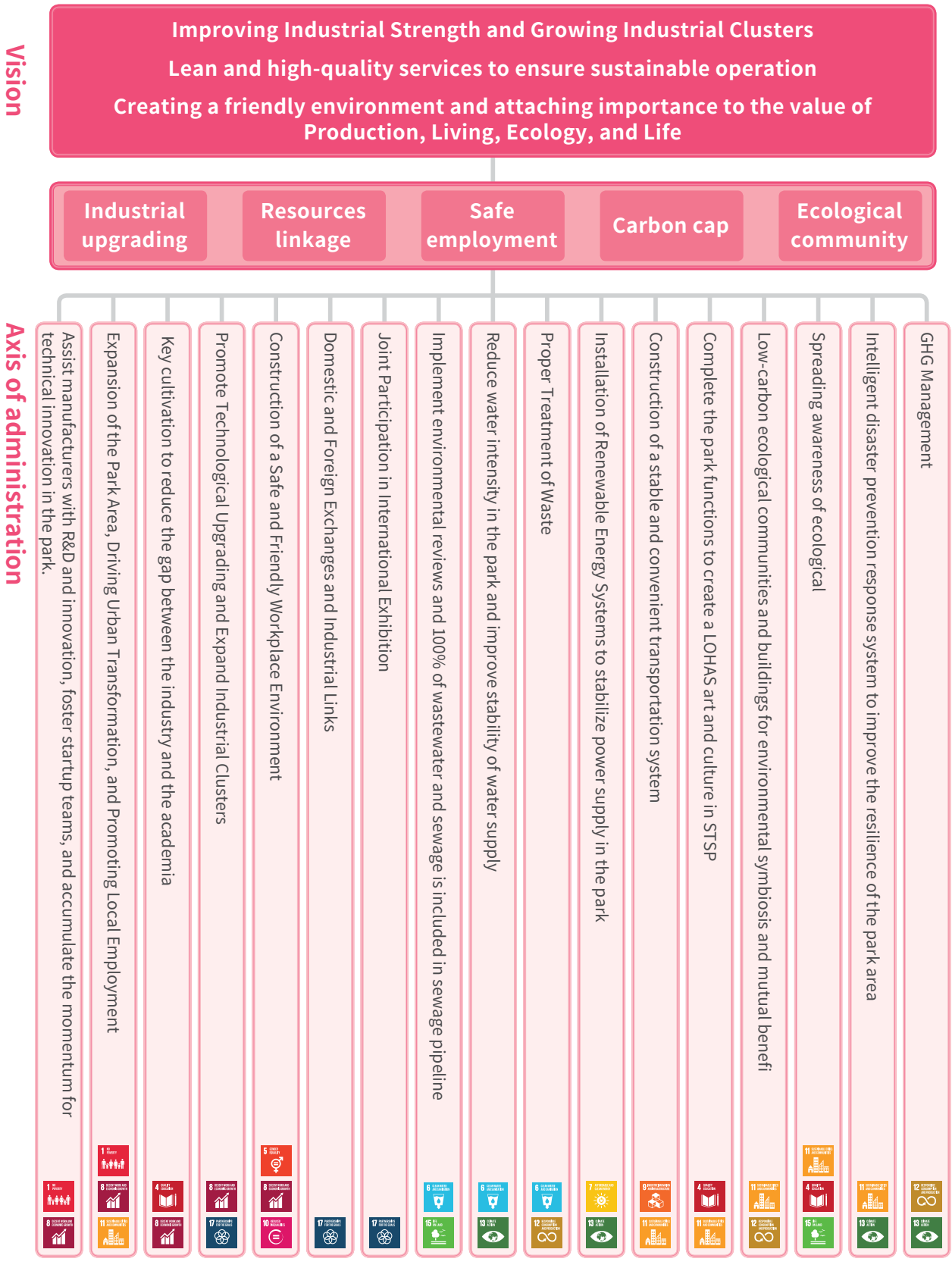
The purpose of the establishment of the science park is to establish a good development base for high-tech industry, balance regional development, and promote industrial upgrading. STSPB regards “Promoting the high-tech industrial cluster in Southern Taiwan for the construction of a Center-Satellite System” as its mission, and further expands its influence outward, striving to promote the balanced development of different aspects of the society. The vision of sustainable development of STSP is “Generating the kinetic energy in the park, Expanding the industrial cluster, Lean and high-quality services to ensure sustainable operation, Creating a friendly environment and Attaching importance to the value of Production, Living, Ecology, and Life”, and stepping toward the goal of Net Zero Emissions by 2050, constructing innovative, inclusive, and sustainable technological visions.

2. Material Goal

The major contributions of STSPB to T-SDGs are cultivation resources, economic development, environmental management, renewable energy, urban and rural development, and climate action, which corresponded to the core goals of 1, 4, 8, 17, 6, 12, 7, 11, and 13. Based on the specific policy content that corresponded to the goals, the 5 major promotion directions of “industrial upgrading”, “resources linkage”, “safe employment”, “carbon cap”, and “ecological community” were developed.

3. The 17 axes pf administration

Linkage between the administration axes and the T-SDGs core goals

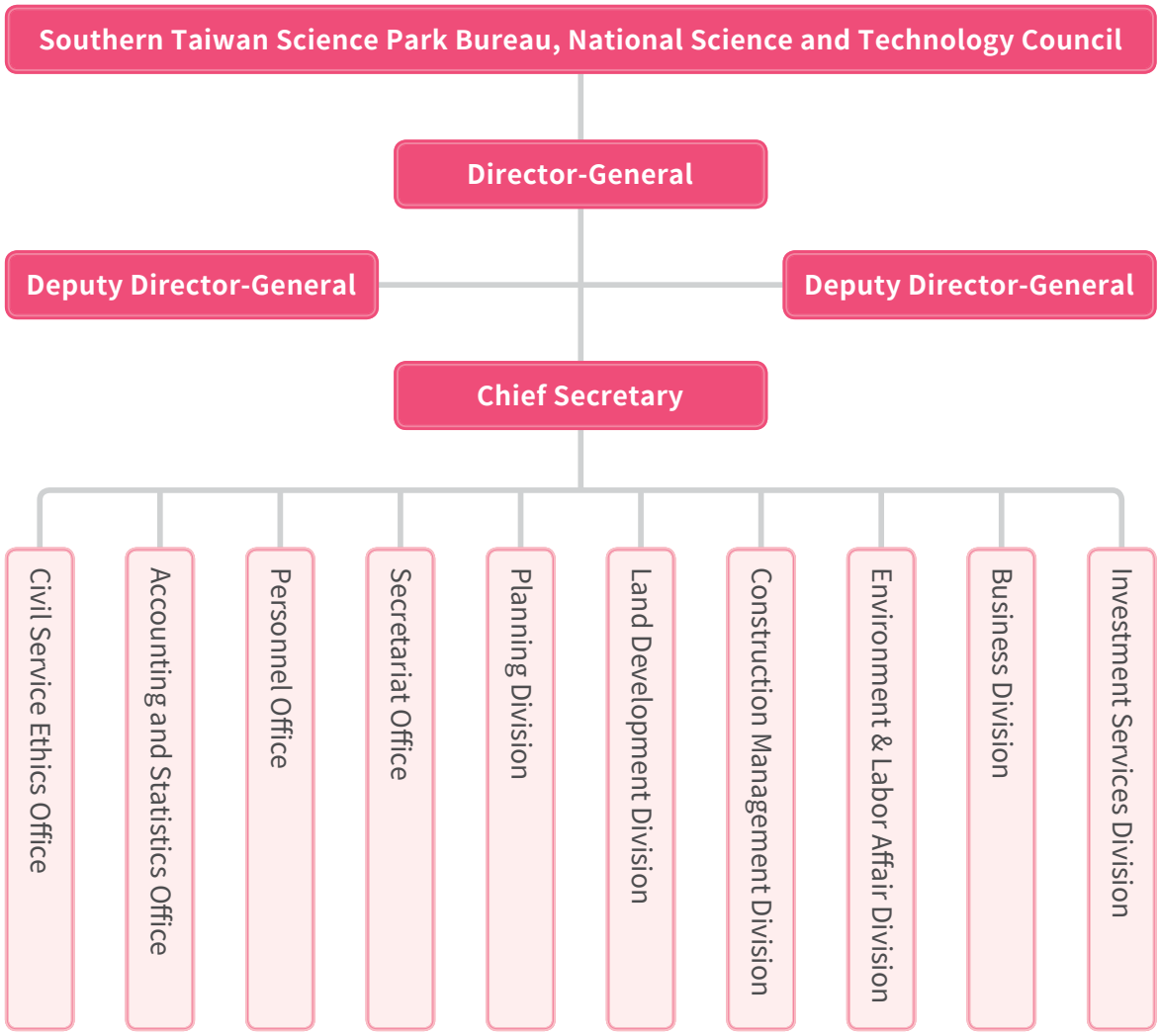


Organizational Structure and Promotion Mechanism

1. Organizational Structure、Composition of members

Southern Taiwan Science Park Bureau, National Science and Technology Council is the designated administrative agency located in the Tainan Science Park, Southern Taiwan Science Park in Tainan City, which is affiliated to the National Science and Technology Council. In accordance with the Organizational Act, the STSPB shall have one Director-General, two Deputy Director-Generals, one Chief Secretary, and 10 divisions and offices, including the Investment Services Division, Business Division, Environment & Labor Affairs Division, Construction Management Division, Land Development Division, Planning Division, Secretariat, Personnel Office, Accounting and Statistics Office and Civil Service Ethics Office, and the functions of the divisions and offices cover all the affairs in the science parks. Ruey-Hwan Chen, the former Deputy Director-General retired on June 2, 2022, and the Chief of the Construction Management Division, Hsin-Chang Lin, was promoted the Deputy Director-General.

Organizational Structure



Business responsibilities of each group

Division	Description of Service
Planning Division	**Planning Section:** In charge of the planning and promotion of park innovation, the entrepreneurial environment and important research on the development of science parks at home and abroad. **Evaluation Section:** In charge of the promotion of the administrative innovation and the service quality and the planning of the park development goals and strategies, as well as matters related to the selection and establishment of the park area. **Financial Planning Section:** In charge of the research and comprehensive planning of the public affairs and estimates of operating funds, and the management and financial analysis of the park operating funds.
Investment Services Division	**Investment Affairs Section:** In charge of the planning and promotion of the attraction of the investment in the science park, the incubation center and the preparation and approval of the application of units to be stationed in the science park. **Industry-Academic Research and Development Section:** In charge of the research and development of industry-academia cooperation in the science park and the promotion and contact affairs of talent training and cultivation as well as the business review of the grants of the R&D of innovative technology projects. **Investment Promotion Section:** In charge of the planning and promotion of the park image and the promotion of the exchanges and cooperation with international science parks and related organizations.
Environ-ment & Labor Affair Division	**Industry Safety Section:** In charge of the planning and coordination of the disaster prevention and emergency response affairs in the science park, the operation management of the 24-hour emergency response center in the science park, the business guidance of the industrial safety promotion association, and the promotion of the health promotion in the workplace within the science park. **Labor Relations Section:** In charge of the counseling and assisting/inspection of labor relations in the science park and the handling of labor disputes. **Environmental Protection Section:** In charge of the planning and promotion of the environmental protection work in the science park, the monitoring and test, analysis and information management of the environment quality of the science park.
Business Division	**Industrial and Commercial Services Section:** In charge of the planning and implementation of the industrial and commercial registration of the park manufacturers (including company registration, factory registration and registration of chattel secured transactions), the deliberation and counseling management of the industrial and commercial services entering the science park, and the coordination of the business in relation to the experimental high school in the science park. **Foreign Trade Section:** The research and draft of the laws and regulations of the trade/bond and the collection of the park business management fees and the deliberation and counseling management of the life service industries entering the science park.

Division	Description of Service
Construction Management Division	**Civil Engineering Section:** In charge of the medium-to long-term annual budgeting of public construction projects and the establishment of park land development projects. **Water, Electrical & Traffic Section:** In charge of the management and rules of park transportation facilities maintenance, the overall planning, coordination and management of water and electricity in the science park, and the review of water and electricity plans as well as the issuance of electric technology license. **Facility Maintenance Section:** Maintenance and management of park/green landscape planting and the establishment and maintenance of the geographic information system (GIS) of the science park.
Land Development Division	**Land Planning and Construction Management Section:** In charge of the review and change of the urban planning in the park, the review and revision of non-urban land, and the planning, development and management of the ecological protection area in the science park. **Land Acquisition and Rental Services Section:** The acquisition, expropriation, appropriation, cooperative development and land management of the land in the science park. **Architectural Section:** The establishment and management of the public art in the science park.
Other	**Secretariat:** In charge of receiving and sending of official documents, the file application and procurement affairs services. **Personal Office:** In charge of personnel administration related affairs. **Civil Service Ethics Office:** In charge of the integrity services and other related affairs. **Accounting Office:** In charge of annual budget, accounting, and statistics affairs.

Scale of Budget

As a public agency, the funds needed are for STSPB to promote administrative affairs, perform official duties and maintain park operations. The budgets are from the national treasure and self-fundraising.

2022 Budget scale of STSPB (NNIEHS excluded)

Item	Amount
The final amount of annual expenditure (including final amount of personnel expenses Note 1)	NTD 0.403 billion (NTD 0.171 billion)
The final account of expenditure of the total business revenues	NTD 6.795 billion
The final account of the total business costs	NTD 6.106 billion
The final account of the fixed assets construction improvement and expansion plans	NTD 2.525 billion

Notes:
1. Personnel expenses include statuary remunerations for staff members, contracted employees and technicians and janitors, bonuses, other grants, overtime pay, retirement pension and insurance.
2. All the budgets and final reports are disclosed on the STSP official website in an open and transparent manner for all to download online.

STSPB budget, monthly final and accounting reports

Staffing

We know that genial services come from happy employees, so we attach great importance to the working environment, development, care for employees and labor rights. We have established multi-directional communication channels and provided equal treatment and respect, striving to create a safe workplace for our employees. The recruitment of personnel is fully protected by laws and regulations, and the personnel's due rights for appointment, rewards and promotion should not be affected due to differences in race, religion, skin color, political affiliation, age, gender, marriage status and physical and mental disabilities.

The total number of employees of STSPB was 135 in 2022. The Director-General is appointed by the Executive Yuan to be in charge of the overall affairs of the Bureau. Two Deputy Director-Generals and one Chief Secretary are appointed by the Ministry of Science and Technology. There are 36 supervisors in total (no one from the minority groups and no foreign employees serve as supervisors). Among the employees, there are 124 regular employees, 5 employed employees, 5 mechanics/ janitors and 1 temporary employee. All the employees are residents in Taiwan, and no child labor under the age of 16 is hired. In addition, there are 28 non-employee workers in the Bureau, who are mainly to assist with the implementation of projects within the Bureau.

In accordance with Article 38 of the People with Disabilities Rights Protection Act, STSPB has actively employed employees with physical and mental disabilities and promoted measures for a friendly workplace. In 2022, the Bureau hired 3 employees with physical and mental disabilities (2 are severely physically and mentally disabled; whereas the employment of a person with severe disabilities, the person shall be calculated as 2, so the employment rate was 3.7%).

Staff Profile of STSPB in 2022

Item	Female			Male		
Age	Under 30	30-50	50 and more	Under 30	30-50	50 and more
Supervisor	0	1	10	0	7	18
Non-supervisor	4	28	11	3	38	10
Hired	0	3	0	0	1	1
Total		57			78	

Notes:

1. There were no part-time employees in 2022.
2. No child labor was used as dispatched labor to perform heavy and dangerous work.

New Staff and Turnover

All the regular employees are civil servants and are protected by the Civil Service Protection Act and Civil Service Employment Act. When employees leave the position due to retirement, promotion or changes of the job positions, and when the supervisor of the unit or when the executive of the unit have arrangements for leave, change, retirement or resignation, the complementary relationship during the period should be handled in accordance with the "Directions for Agency in Duty in Government Agencies". The contracted staff are hired on a yearly basis, and therefore do not apply to the minimum notice period stipulated in the Labor Standard Act.

Ratio of new staff and labor turnover in 2022

Item	Age	Under 30		30-50		50 and more	
	Gender	Female	Male	Female	Male	Female	Male
New staff	Number of people	3	0	5	10	0	1
	Ratio	2.22%	0.00%	3.70%	7.40%	0.00%	0.74%
Labor turnover	Number of people	0	0	2	5	1	0
	Ratio	0.00%	0.00%	1.48%	3.70%	0.74%	0.00%

Notes:

1. Employment rate= Number of new staff/Total number of staff at the end of the current year.
2. Turnover rate= Turnover number/Total number of staff at the end of the current year.

2. Clear Division of Labor and Responsibilities

To implement the Taiwan Sustainable Development Goals (T-SDGs), STSPB has been promoting various sustainable development work and expanded 3 visions to 17 items that clearly correspond to the major core goals involved in the business of STSPB, and each division and office is in charge of the promotion work in accordance with the business relevance to each unit. Relevant implementation results are reported to the competent authority on a regular basis, and irregular meetings and exchanges of official documents are also used to discuss the implementation status.

Vision

Improving Industrial Strength and Growing Industrial Clusters

Axis of administration	Business related units
Assist manufacturers with R&D and innovation, foster startup teams, and accumulate the momentum for technical innovation in the park.	Planning Division、Invest-ment Services Division、Industry-Academic Research and Develop-ment Section
Expansion of the Park Area, Driving Urban Transformation, and Promoting Local Employment	Evaluation Section、Civil Engineering Section
Promote Technological Upgrading and Expand Industrial Clusters	Industry-Academic Research and Development Section
Key cultivation to reduce the gap between the industry and the academia	Industry-Academic Research and Development Section Industrial and Commercial Services Section
Construction of a Safe and Friendly Workplace Environment	Labor Relations Section、Industry Safety Section Industrial and Commercial Services Section
Domestic and Foreign Exchanges and Industrial Links	Investment Promotion Section、Industry-Academic Research and Development Section
Joint Participation in International Exhibition	Investment Promotion Section、Industry-Academic Research and Development Section

Vision

Lean and high-quality services to ensure sustainable operation

Axis of administration	Business related units
Implement environmental reviews and 100% of wastewater and sewage is included in sewage pipeline	Environmental Protection Section
Reduce water intensity in the park and improve stability of water supply	Environmental Protection Section、Water, Electrical & Traffic Section
Proper Treatment of Waste	Environmental Protection Section
Installation of Renewable Energy Systems to stabilize power supply in the park	Architectural Section、Water, Electrical & Traffic Section

Vision

Creating a friendly environment and attaching importance to the value of Production, Living, Ecology, and Life

Axis of administration	Business related units
Construction of a stable and convenient transportation system	Water, Electrical & Traffic Section
Complete the park functions to create a LOHAS art and culture in STSP	Foreign Trade Section、Labor Relations Section、Land Planning and Construction Management Section、Industrial and Commercial Services Section
Low-carbon ecological communities and buildings for environmental symbiosis and mutual benefit	Facility Maintenance Section、Civil Engineering Section、Architectural Section
Spreading awareness of ecological	Land Planning and Construction Management Section、Environmental Protection Section
Intelligent disaster prevention response system to improve the resilience of the park area	Water, Electrical & Traffic Section、Industry Safety Section
GHG Management	Environmental Protection Section

3. Promotion of T-SDGs decision-making, implementation, and monitoring process

STSPB has been actively promoting sustainable development and has released 10 Sustainability Reports. To better demonstrate results related to T-SDGs, STSPB compiled the Voluntary Department Reviews (VDR) for the first time to systematically collect the specific contributions of the activities in the science park to the sustainable development in Taiwan, which was also supported by the highest decision-making level (the Director-General, two Deputy Director-Generals, and the Chief Secretary). The Environment and Labor Affair Division and the ESG Editing Team jointly developed the details to implement the VDR and explained the VDR-related work to our associates in all units to concretely link T-SDGs with the normal daily businesses in the park. The Environment and Labor Affair Division then compiled relevant policies and promotion results provided by all units, followed by the review and check of the content in the VDR by the first-level supervisors of each unit and division. Finally, the VDR will be issued upon the signature of approval by the General-Director. This is to ensure that the decision-making level and the business execution units have consistent goals to jointly reach the vision of the sustainable development of STSPB.

In the future, through the compilation of the VDR, the changes in the external environment and the attentive status of the self-defined indicators can be regularly reviewed. Rolling review is conducted to revise the content of sustainable development work promoted by STSPB.

Major core goals and results of promotion

Vision：Improving Industrial Strength and Growing Industrial Clusters

The STSPB incorporates industrial innovative development with the world's digital transformation trends, to strengthen industrial key R&D technologies and lead the way for industrial transformation and upgrading. By targeting specific investment recruitments, the STSPB works to close the gap between the supply chains of the IC, the medical device and aerospace industries, to continuously boost the competitiveness of industrial clusters at the STSP.

Specific corres-ponding goals	Target 1.4 Enhance the protection and equality of all citizens, particularly the vulnerable,those impaired, in starting business, employment, loan, financing, housing,and land ownership.
	Target 4.4 Enhance youth' s obtainment of information and communications technology (ICT) skills, and increase the opportunities of youth to gain relevant professional techniques and vocational skills.
	Target 8.2 Increase the value addition of industries and promote the high-value development of the loT and digital economy.
	Target 8.6 Realize knowledge-action integration and training to strengthen youth employability.
	Target 8.7 Promote work environment safety and protect the right to participation in labor unions of women workers.

Core Goal 1

Goal 1 Strengthen social care services and economic security for the disadvantaged

Specific corresponding goals	Self-defined tracking indicators	Authority
Target 1.4 Enhance the protection and equality of all citizens, particularly the vulnerable,those impaired, in starting business, employment, loan, financing, housing, and land ownership.	The Start-up Workshop cultivates at least 2 start-up teams to establish companies every year.	Planning Section
	To provide guidance to at least 4 start-up teams to participate in the From IP to IPO Program (FITI) and to enter the final selection.	
	The target is to introduce 20 new manufacturers (including 4 start-up companies).	Investment Affairs Section

Challenges/opportunities faced

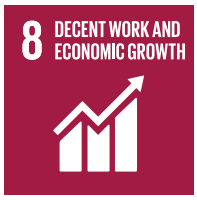
To accelerate the growth of high-tech industries and balance regional development, STSPB not only invites enterprise investors but also strengthens the cultivation of innovative high value-added enterprises, encourages start-ups to invest in the development and self-manufacturing of AI robot industry and products. We provide resources such as entrepreneurship counseling, professional instructors form the industry, linkage with the industry and capital matching to foster cross-field innovative talents and introduce new start-ups into the science park to deepen the root of technology in the science park and revitalize the development of STSP.

In addition, due to the fact that the existing land lease rate at STSP has reached the upper limit, we now make use of the spillover effect of the semiconductor industry in Tainan and reserve industrial land by handling the third-phase expansion project of Tainan Science Park and the preparatory work for the establishment of new facilities in Ciaotou, Pingtung, and Chiayi Science Parks as well as the preparatory work of the Nanzi Science Park to construct a science and technology corridor in Southern Taiwan and strengthen regional economic resilience.

Specific actions and promotion highlights

+ Assist manufacturers with R&D and innovation, foster startup teams, and accumulate the momentum for technical innovation in the park

Other core goals involved



Implementation content and promotion results

1. The Start-up Workshop

STSPB has set up the Start-up Workshop and introduced a one-stop matchmaking platform for entrepreneurial resources, providing start-up teams with a field for entrepreneurial development, coupled with the cooperation with the manufacturers and industry experts, basic prototype trial production equipment and resources, exclusive guardian and application for project grants, enabling these start-up teams to successfully start their own business under the assistance of STSPB.

To assist start-ups to obtain start-up capital, STSP Start-up Workshop and National Cheng Kung University joined hands to facilitate the matchmaking of these start-ups with Headwater Capital, Smart Capital, Excellent Water Appraisal Intelligence (EWAi) and other venture capital institutions and angel investors. On May 27, 2022, the Start-ups Matching Exhibition was held to serve as a bridge between the start-up teams and the venture capital institutions. By gathering the potential teams cultivated by STSPB together, we made a strong pitch to obtain opportunities for fundraising matchmaking.

The grand scene of 7 venture capital institutions and angel investors and 10 potential start-up teams gathering together at the event

STSP Start-up Workshop was also linked with the 5 colleges and universities of the GLORIA 2.0 X South Platform and joined the BIO Asia–Taiwan held between July 28-21, 2022, and a total of 8 STSP start-up teams participated in this event. These start-up teams specialize in the development of long-distance digital rehabilitation systems, drugs for cancer treatment, detectors, infant prosthetics, new coronavirus variant protein chips, peptide skin care products, wearable detection products, etc., with diversified and innovative technologies and fruitful results.

8 start-up teams from STSP participated in BIO Asia–Taiwan and demonstrated their innovative technologies

The Start-up Workshop cooperates with MOST's From IP to IPO Program (FITI) to bridge the gap between innovation and entrepreneurship, implement the goal of promoting innovation economics and tech transformation, and actively coach and train start-up teams to participate in FITI program. The main fields include biomedical industry, innovative technology and design, and information application and services, with each session lasting 6 months. It is hoped to link entrepreneurship counseling resources in the 6-month systematic training to help young students move toward the path of innovation and entrepreneurship, and to further drive the domestic trend of entrepreneurship. In 2022, STSPB coached 5 teams to win the Startup Potential Award (Mag Technology, Charcoal Incredible}, Alloytek, High Voltage Electrostatic Field (HVEF)System for the Fresh Fruits and Vegetables, and Liggle), with a total ofNTD1.9 million as the start-up funds, and the range of tutoring and coaching extended to colleges and universities all around Taiwan.

Group photo of the winning teams from STSP

From IP to IPO Program (FITI)

2. AI_ROBOT Base at STSP

With the advantages of the smart machinery in STSP, combined with the park manufacturers and surrounding scientific research institutions, STSP's AI_ROBOT Base focuses on AI, robotics, and other related technologies, using the self-production field and facilities to assist with development. With the concept of sharing resources, the well-constructed sites and multiple equipment instruments are shared with manufacturers in need, and tutoring and coaching are provided to start-up companies to cooperate with enterprises for the co-creation to facilitate growth and creation. We encourage start-up companies to become science business to keep the roots of technology in the science park.

(1) STSP's AI_ROBOT Base joined hands with Start-up Workshop to guide the development of scientific start-ups

STSP's AI_ROBOT Base and the Start-up Workshop jointly held the "STSP's AI_ROBOT Base Resources Application Results Sharing x Matchmaking Meeting" on October 25, 2022, and resources matchmaking was carried with the themes of smart manufacturing and smart medicine (eHealth) to provide multiple software and hardware resources to the start-up teams while at the same time publicized STSP's overall resources for innovation and start-ups, increasing the exposure of STSP's service platform of innovation and start-ups services. In the two sessions of event, the sales manager of the Lean Smart Automation and the CEO of the Location Intelligence for Mobile that STSPB is currently cooperating with were invited to share the actual achievement of technical cooperation. The base capacity and space equipment guide was also provided, followed by resources matchmaking and exchanges among groups.

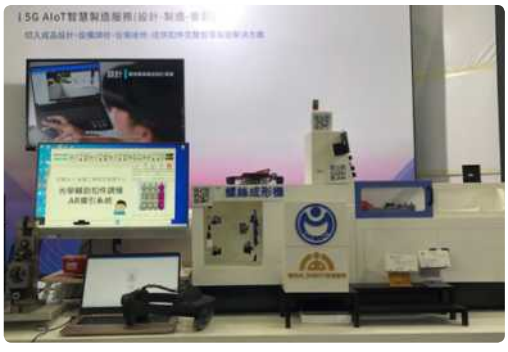
Smart manufacturing results sharing and matchmaking meeting

(2) Building a 5G Field to Assist Industrial Technology Innovation

STSP's AI_ROBOT Base continues the achievements of the 5G AIoT field demonstration project promoted previously and conducted the value-added integration of the innovative technology in smart manufacturing, including AR maintenance and repair technology, Vibration sensing technology, and the base's information security and real-time monitoring technology to create a 5G AIoT total solution. Special counseling is provided to manufacturers to solve problems of remote after-sales services of equipment, risks of business trips due to the pandemic, and inability to effectively monitor machines, and so on.

The successful model was extended and applied in Startup Terrace Kaohsiung. STSP's AI_ROBOT Base led the Lean Smart Automation System Co., Ltd, and Cavern Treasury Tech Innovation., Ltd. to participate in the 2022 Meet Greater South X 5G AIoT Expo held by the Kaohsiung City Government on August 26-27 to share the experience cooperating with start-

up companies and proposed solutions for the shortage of workers and talent gaps in the fastener-related industries, including solutions through AI data analysis and introduction of AR technology. We look forward to the cooperation with the start-up teams by assisting in and jointly discussing the industrial digital transformation issues with the enterprises and introduce the resources into STSP start-up incubation base to jointly promote business opportunities to achieve the win-win situation. STSP's AI_ROBOT Base will continue to expand its 5G technology application services and introduce the actual industrial application end so as to facilitate industrial upgrading and transformation while supporting start-up companies.



5G AIoT Smart Manufacturing Service

2022 Meet Greater South X 5G AIoT Expo

AI_ROBOT Base

3. STSP's TAIRA Accelerator

The TAIRA Accelerator uses the cooperation mode of large-scale businesses working with small scale corporations and the provision of R&D subsidies and business cooperation opportunities attract high-quality start-ups to Southern Taiwan for co-creation of innovation with businesses, linkage with international resources to access to the international cooperation network, assisting these entrepreneurs with rapid growth in the most direct way.

June 24	Taiwan AI x Robotics Accelerator (TAIRA) worked with Taiwan Electrical and Electronic Manufacturers' Association (TEEMA) and Taiwan Information Security Association (TWISA) and organized an exchange meeting on Enterprise Digital Innovation and Information Security Energy in the TAIRA Space, inviting a number of enterprises and our start-up partners to discuss issues in relation to information security, manufacturing services, and so on. In addition, enterprises such as Advantech co., Ltd. and NexAIoT were invited to have one-on-one discussion for possible cooperative opportunities with the start-ups.

July 26, August 12	In the 2022 1-on-1 Business Matchmaking Meeting organized by TAIRA, enterprises including Castec International Corp., Taiwan Stipendiary Co., Ltd., Show Chwan Memorial Hospital, Advantech AiCS, AllRing-Tech (ART), HannStar Display Corporation and so on had one-on-one matchmaking meeting at TAIRA SPACE to enable excellent start-up partners with advance technologies to have a face-to-face business meeting with corporate executives so as to speed up order and field verification possibilities.
November 17-19	We led STSP TAIRA Start-ups, including Yallvend, InfinitiesSoft, Profet AI and so on with Mizuho Bank to Tokyo, Japan, for matchmaking and contacting Japanese market. Mizuho Bank even arranged meetings with well-known Japanese enterprises, Tokyo Metropolitan Government and other units to assist the start-up teams to connect with local enterprises and resources faster. STSPB, StarFab and Mizuho Bank worked together for the start-ups to obtain international business opportunities.

TAIRA and TEEMA organized an exchange meeting to assist start-ups to demonstrate total solutions for digital transformation and information security

At 2022 1-on-1 Business Matchmaking Meeting organized by TAIRA, the vice president of Taiwan Stipendiary Co., Ltd., Mr. Kuo-Lun Weng, and the start-up partner discussed possibilities of smart medical application together

Three TAIRA start-ups heading for Tokyo for business opportunities with the assistance of TAIRA and Mizuho Bank

＋ Expansion of the Park Area, Driving Urban Transformation, and Promoting Local Employment

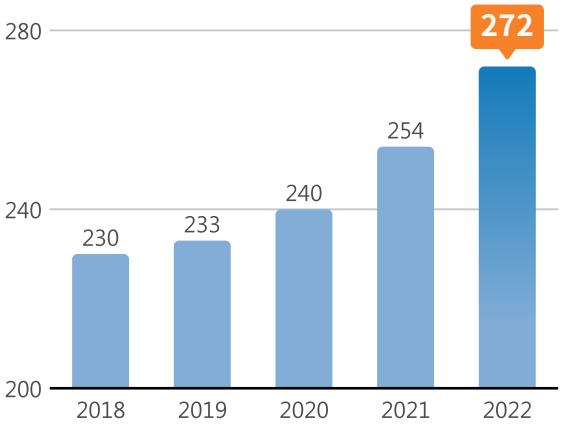
Other core goals involved

Implementation content and promotion results

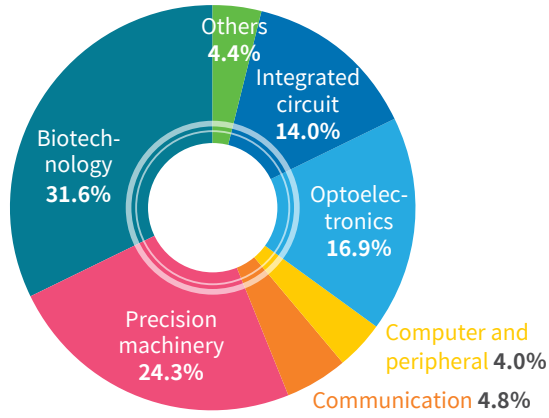
1. Overview of Development

In 2022, 30 manufacturers (including 12 start-up companies) were introduced into STSP, with an investment amount of approximately NTD 55.807 billion. Among the new manufacturers, 8 have the unit output value per hectare more than NTD 1 billion. There were 6 plant construction projects in the same year. The cumulative number of validly approved manufacturers as of 2022 reached 272, showing that the investment attraction power of STSP continues to grow.

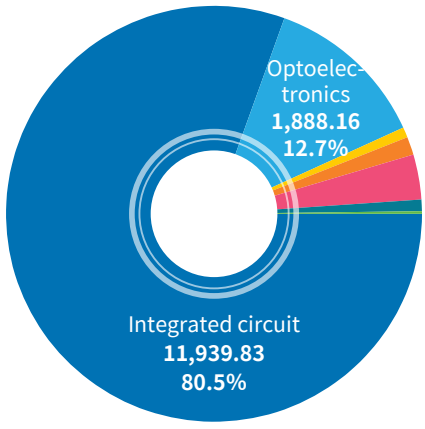
Number of validly approved manufacturers



Number of validly approved manufacturers in 2022 by industry



2022 Turnover by industry

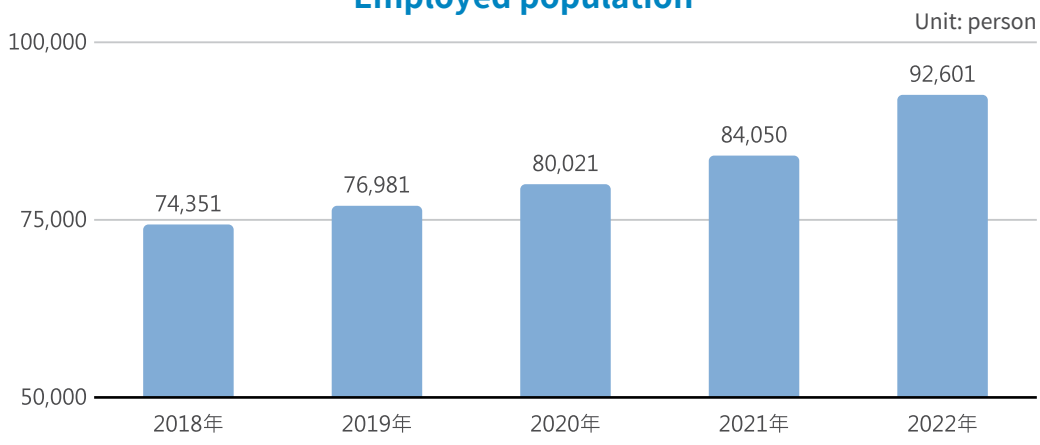


Computer and peripheral **115.86** **0.8%**
Communication **211.21** **1.4%**
Precision machinery **519.13** **3.5%**
Biotechnology **127.31** **0.9%**
Others **32.25** **0.2%**

2. Growth in Employment

The industrial clusters in STSP are thriving. To assist the park manufacturers in finding good talents and help the job seekers with employment opportunities, STSPB works with the local government and other business units to co-organize a number of talent recruitment activities every year. As of December, 2022, the total number of employees in STSP has reached 92,601, an increase of 10.17% compared with the same period in 2021. We hope to attract more excellent talents to join STSP and bring vitality to the science park.

Employed population



STSP has organized recruitment activities with many units in the park, providing an opportunity for those who are away from home to return and work in their hometown.

Winter Camp- A Visit to STSP

The 2022 Winter Camp- A Visit to STSP was held during winter vacation. The themes of the winter camp included environmental engineering, biomedical technology, semiconductors, and optoelectronics, allowing students majoring in relevant departments to “visit STSP and learn about what is needed for future employment” and have a basic understanding of the industry. During the peak of the COVID-19 epidemic, we strictly adhered to the epidemic prevention regulations and held the visit activities in small scales. During the winter and summer vacations, the number of visitors was 131 and 108 respectively.

The winter camp was held in Tainan Science Park and Kaohsiung Science Park. In addition to the introduction of the living environment of the science parks, STSP Employment Service Station and Gangshan Employment Service Center also explained the situation of talent needs at STSP.

We also planned multiple itineraries in different sessions, including the visit to iBIOMED FLAGSHIP HALL in Kaohsiung Science Park (biomedical technology theme), and the Resource Recycling Center and wastewater treatment plant in Tainan Science Park (environmental engineering theme). Manufacturers including Huang Liang Technologies, Merck KGaA, TSMC, UMC, and others to have exchanges with the students.

Visit the iBIOMED FLAGSHIP HALL

Exchanges between the manufacturers and the visiting students

Work in Kaohsiung Job Fair

STSPB and Labor Affairs Bureau of Kaohsiung City Government co-organized the 2022 large-scale on-site job fair on July 23, with 38 manufacturers providing 1,300 job opportunities. Eight well-known manufacturers in STSP Kaohsiung Science Park, including Taiwan Tohcello Functional Sheet, Inc., Zacros Group, Taiwan Nitto Optical Co., Ltd, Passive System Alliance, Ares Green Technology Corp., Magnate Technology Co., Ltd., and others were also invited to the job fair and were well received by the job applicants on site. In addition to providing on-site job interviews, the Career Personality Aptitude System (CPAS) was also arranged to help the job seekers find a good job.

Many new graduates came to apply for jobs, and there were many job opportunities offered by local companies.

Living and Working in Tainan Job Fair

The distinguished guests commonly wished the event a great success.

STSPB and Labor Affairs Bureau of Tainan City Government co-organized the 2022 Living and Working in Tainan Job Fair on March 26 in Shanhua Community Center. There were 83 manufacturers providing 7,077 job opportunities, and among them, 3,643 job opportunities were provided by the manufacturers in the science park. Many well-known manufacturers, including TSMC, UMC, InnoLux, Wiwynn, and Wistron NeWeb Corp. (WNC) also participated in the event to recruit talents, attracting talents from various fields to settle down and work at STSP.

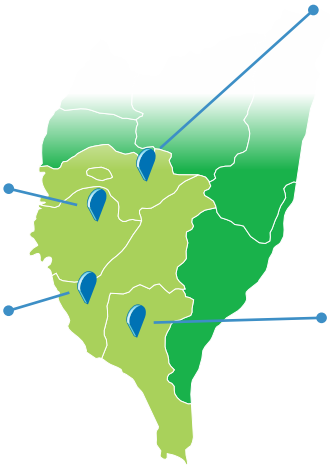
3. Expansion of the Park Area

According to the land lease statistics, as of the end of December, 2022, the lease rate of Tainan Science Park was99.75% while that of Kaohsiung Science Park was97.78%. To cope with the challenges of industrial development, the Bureau has prepared the industrial layout in advance to prepare land for industrial development and gather resources for industrial development. In addition, the development thinking incorporated with innovation, sustainability, and inclusion is introduced to assist in the upgrading of local industries, making the science park the driving force for Taiwan's new economy.

The promotion of newly established expansion parks is estimated to create at least NTD 202.2 billion in output value, providing approximately 22,100 job opportunities, expanding the existing effect of industrial clusters, driving innovation of local industries by integrating software and hardware resources, strengthening regional economic resilience, and completing the technology corridor in southern Taiwan.

Profile of Tainan Science Park Phase III Expansion Project

Chiayi Science Park



Ciaotou Science Park

Pingtung Science Park

Ciaotou Science Park

Ciaotou Science Park, the second park area of STSP Kaohsiung Science Park is planned to be established on an exclusive industrial zone within the expropriation area of the Kaohsiung New Town Second Phase Development Area. The groundbreaking ceremony for the zone expropriation project was organized in September, 2022, and land was provided to manufacturers to simultaneously construct plants. It is planned to introduce semiconductors, aerospace, smart machinery, precision health, industrial innovation and other industries. With the upgrading of local industries and the virtual-physical integration strategies, it will move toward AIoT field as the development direction to lead the trend of future industrial development.

- A total area of 262.39 hectares, 163.94 hectares for plant establishment
- It was provided to manufacturers to build plants in September, 2022
- Expected to create an annual output of approximately NTD 100-180 billion and create 7,500-11,000 job opportunities

Notional diagram of the industrial planning in the Ciaotou Science Park

▸ “Scientific and Innovative Kaohsiung Led by the Ciaotou Science Park”- The simultaneous commencement of the zone expropriation project of the Ciaotou Science Park and the groundbreaking ceremony of manufacturers

The Ministry of Interior, National Science Council, and Kaohsiung City Government co-organized the Launch Ceremony for zone expropriation and groundbreaking for manufacturers at Ciaotou Science Park on September 2, 2022. Four manufacturers including Caware Filtering Corp., E&R Engineering Corp., Sync-Tech System Corp., and ASC-Allied Supreme Corp. announced the groundbreaking simultaneously with the zone expropriation project. The Premier Tseng-Chang Su, Interior Minister Kuo-Yung Hsu, Minister of National Science and Technology Council Tsung-Tsong Wu, Kaohsiung Mayor Chi-Mai Chen and many industry representatives participated in this groundbreaking ceremony, and the public work of the Ciaotou Science Park and the groundbreaking of the plants of park manufacturers were simultaneously launched.

Under the joint cooperation of the Ministry of Interior, the Ministry of Transportation and Communication, Council of Agriculture, and Kaohsiung City Government, central and local governments and agencies worked together for the development of the Ciaotou Science Park. Two years and nine months have passed since the Executive Yuan approved the planning and design of the Ciaotou Science Park in December, 2019, and the progress of the development was on schedule with quality expected. The development of the Ciaotou Science Park is an example of cross-ministerial coordination and integration. In the future, digital complex buildings will be built here to provide start-ups to station here, aiming at nurturing the future major industries and making the science park a world-class one.

The Launch Ceremony for zone expropriation and groundbreaking for manufacturers at Ciaotou Science Park

Tainan Science Park Phase III Expansion Project

The Tainan Science Park Phase III Expansion Project (hereinafter referred to as Phase III Project) is located in Kanxi Farm on the southwest side of Tainan Science Park, and the expansion project was approved by the Executive Yuan in April, 2020, and the review of environmental impact assessment and changes in urban planning have been completed and entered the substantive development stage. Semiconductors, smart machinery, precision health, industrial innovation and other industries will be introduced to shape the effect of industrial clusters.

- A total area of 84.51 hectares, 38.91 hectares for plant establishment
- Expected to be provided for manufacturers to enter and set up plants in May, 2023
- Expected to create an annual output of approximately NTD 39.2 billion and create 4,900 job opportunitie

Notional diagram of the Tainan Science Park Phase III Expansion Project

Pingtung Science Park

Pingtung Science Park is located in the designated area for Pingtung High Speed Railway. The preparatory design was approved by the Executive Yuan in January, 2022, and the plaque unveiling ceremony of the preparatory office was conducted in March the same year. The environmental impact assessment and non-urban development plan have been reviewed and entered substantive development stage. We will actively introduce industries such as smart agriculture and medicine, green materials, space technology, and other emerging technologies to lead the transformation and upgrading of local industries and accelerate the formation of technology industries.

The plaque unveiling ceremony of the Pingtung Science Park Preparatory Office was held on March 26, officially announcing the launch of the Pingtung Science Park.

- A total area of 73.83 hectares, 38.17 hectares for plant establishment
- Expected to be provided for manufacturers to enter and set up plants in May, 2023
- Expected to create an annual output of approximately NTD 30.5-36 billion and create 4,800~5,400 job opportunities

Notional diagram of the industrial planning in the Pingtung Science Park

STSPB and Pingtung County Government organized the Forum on Investment Invitation and Academia-Industry Exchange for Pingtung Science Park on August 12, 2022, and the Summit Forum and Research Demonstrations on October 31, inviting manufacturers intending to enter Pingtung Science Park and experts from industry and academics, as well as teams from the surrounding universities to demonstrate their R&D results. In the future, Pingtung Science Park will combine the foundation of the existing industrial clusters in Southern Taiwan and introduce industries such as smart agriculture and medicine, green materials, space technology, and other emerging technologies to realize the vision of “Setting off in Pingtung, Renovation for Pingtung”.

Forum on Investment Invitation and Academia-Industry Exchange for Pingtung Science Park

Chiayi Science Park

Chiayi Science Park is located in Taibao Farm in Taibao City. The preparatory project was approved by the Executive Yuan in January, 2022, and the plaque unveiling ceremony of the preparatory office was conducted in April the same year. The environmental impact assessment and non-urban development plan have been reviewed and entered substantive development stage. We will actively introduce industries such as precision health, intelligent vehicles, smart agriculture and other emerging technologies to drive the transformation of local industries in Chiayi Region.

The plaque unveiling ceremony of the Chiayi Science Park Preparatory Office was held on April 3, and Chiayi was ready to take off!

- A total area of 88 hectares, 40.68 hectares for plant establishment
- Expected to be provided for manufacturers to enter and set up plants in May, 2023
- Expected to create an annual output of approximately NTD32.5-38 billion and create 4,900~5,700 job opportunities

Notional diagram of the industrial planning in the Chiayi Science Park

STSPB and Chiayi County Government organized the Forum on Investment Invitation and Academia-Industry Exchange for Pingtung Science Park on August 12, 2022, and the Summit Forum and Research Demonstrations on October 28, inviting manufacturers intending to enter Chiayi Science Park and experts from industry and academics, as well as teams from the surrounding universities to demonstrate their R&D results. In the future, Chiayi Science Park will combine the surrounding industrial parks and introduce industries such as precision health, intelligent vehicles, smart agriculture and other emerging technologies to realize the vision of “Getting Ready & Taking Off for Chiayi”.

Forum on Investment Invitation and Academia-Industry Exchange for Chiayi Science Park

Note: The above data was gathered as of the end of March, 2023.

Advanced Planning

STSP mainly focuses on the fields of biomedicine, innovative technology and design and information application and services to assist and train the start-ups to bridge the gap between innovation and entrepreneurship and also tutor them to participate in the From IP to IPO Program (FITI). However, despite the excellent results achieved by the participating teams over the years, there are only a relatively small number of teams that can withstand the challenges in the market to successfully expand the scale and become resident businesses in the science park. Therefore, STSPB is aware that nurturing start-ups requires long-term efforts. It is hoped that over time, the quantitative changes will facilitate the qualitative changes so as to foster another emerging industry that will be the leading industry in the future.

With the development of the industrial clusters, STSP will continue to link relevant resources and prepare industrial land to expand to Chiayi and Pingtung areas. In addition to bringing employment opportunities, industries such as precision health, intelligent vehicles, smart agriculture, green materials, space technology, and other emerging industries are planned to be introduced to drive the upgrading of local industries and strengthen the resilience of the regional economy. In addition, other science parks can be connected to create aa science and technology corridor in Southern Taiwan to facilitate co-prosperity of technology and the environment, creating an exquisite, diverse, high-quality, energy-saving and sustainable smart science park.

Core Goals 4 and 8

Goal 4 Ensure inclusive and equitable quality education and promote lifelong learning opportuni-ties for all

Goal 8 Promote sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all

Specific corresponding goals	Self-defined tracking indicators	Authority
Target 4.4 Enhance youth' s obtainment of information and communications technology (ICT) skills, and increase the opportunities of youth to gain relevant professional techniques and vocational skills. Target 8.6 Realize knowledge-action integration and training to strengthen youth employability.	Continue to handle the subsidies for industry-university collaboration training courses (Science Park Talent Cultivation Subsidy Program), subsidizing at least 10 modular courses annually.	Industry-Academic Research and Development Section
	Continue to organize training for technical talents in the park (Professional and Technical Talent Training Plan), offering at least 300 hours of courses every year.	
Target 8.2 Increase the value addition of industries and promote the high-value development of the loT and digital economy.	Continue to promote the review of subsidy of innovative technology and R&D projects (Science Park Emerging Technology Application Project) and provide subsidies to at least 6 projects every year.	Industry-Academic Research and Develop-ment Section
Target 8.7 Promote work environment safety and protect the right to participation inlabor unions of women workers.	Implement at least 3 sessions of propaganda on gender equality publicities.	Labor Relations Section
	Implement at least 70 sessions of labor condition inspections	

Goal 8 Promote sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all

Specific corresponding goals	Self-defined tracking indicators	Authority
Target 8.7 Promote work environment safety and protect the right to participation inlabor unions of women workers.	Continue to handle the subsidies for industry-university collaboration training courses (Science Park Talent Cultivation Subsidy Program), subsidizing at least 10 modular courses annually.	Industry-Academic Research and Development Section
	Continue to organize training for technical talents in the park (Professional and Technical Talent Training Plan), offering at least 300 hours of courses every year.	

Challenges/opportunities faced

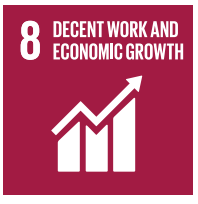
To assist with the development of industrial clusters, STSPB cooperates with the National Science and Technology Council's development plan and actively assists with the upgrading of industries. In addition, we also assist the manufacturers in linking the international market and resources by constructing a high-quality environment for R&D to facilitate the application of the scientific research results in the industries to meet the industrial needs to give full play to the synergy of the integration of the resources in the industry, government, academia, and research institutions, promoting the industrial innovation and enhancing the international competitiveness with a sound and innovative ecological environment.

During the process of industrial transformation and upgrading, the capacity of talents can facilitate the stable operation of an enterprise, and it is even a key resource for sustainable management. Therefore, STSPB also actively assists with the cultivation of high-tech professionals. At the same time, we also encourage enterprises to establish a safer and more stable labor conditions through counseling and inspections so as to attract more talents to work in STSP.

Specific actions and promotion highlights

+ Key cultivation to reduce the gap between the industry and the academia

Other core goals involved

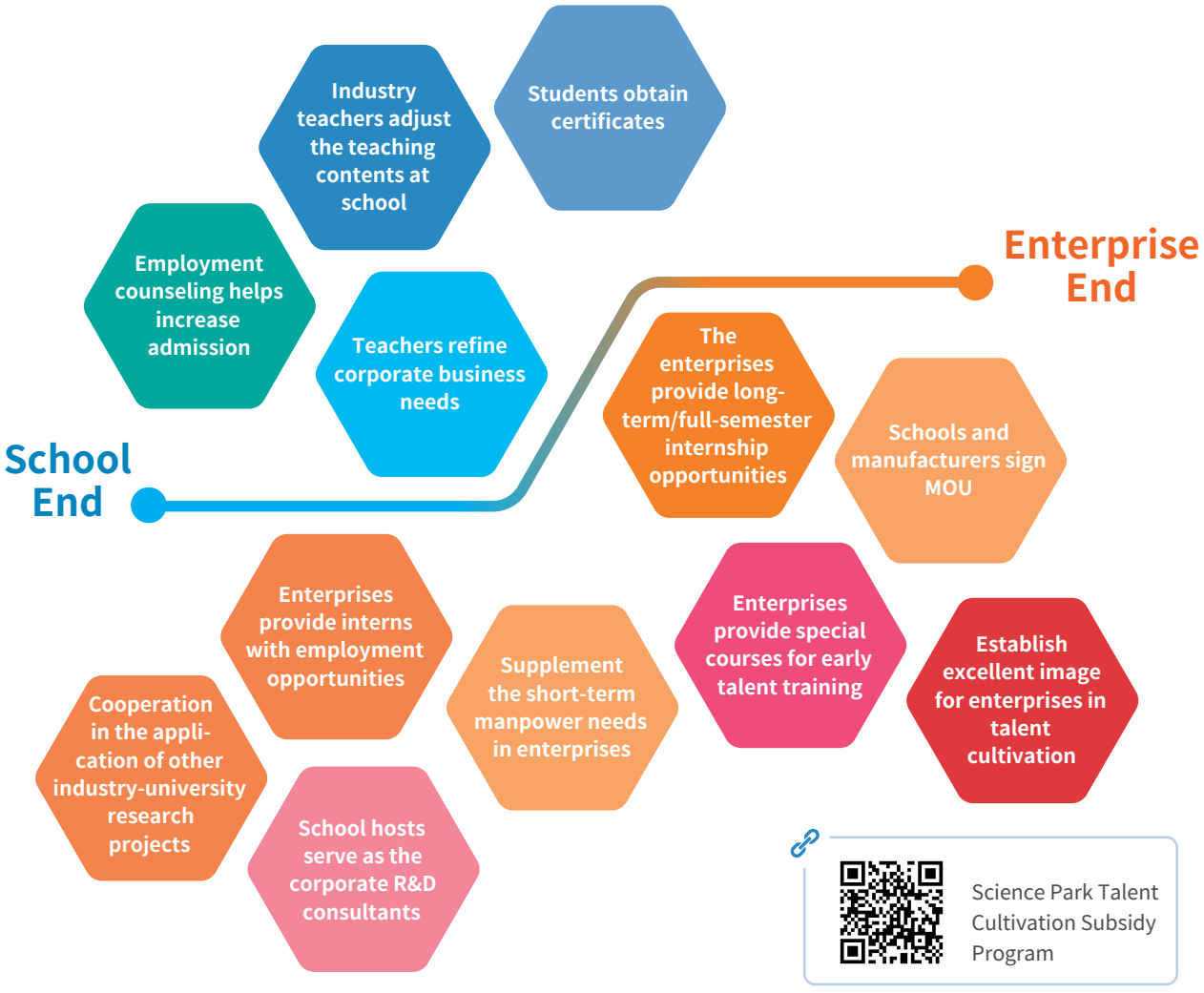


Implementation content and promotion results

1. Science Park Talent Cultivation Subsidy Program

To encourage the sustainable innovation and R&D of the manufacturers and assist the cultivation of high-tech professionals, STSPB encourages the colleges and universities near the science park to organize professional module courses that are in line with high-tech industries to enhance the professional skills of the graduates-to-be. Furthermore, theoretical teaching and practical experience are combined through internships to shorten the gap between learning and application among talents in the technology industry to establish an effective industry-academia matching mechanism for the park manufacturers.

This program facilitates exchange opportunities between schoolteachers and the industry in teaching and researching through industry-university collaboration projects, which further increases the employment opportunities for students. In 2022, STSPB has confirmed 12 projects, with a total subsidy of NTD 7.92 million. A total of 8 schools actually implemented the talent cultivation projects, providing 12 module courses and corporate internship courses, cultivating 894 people. In addition, the cultivation results included 4 competitions, 4 categories of certification, 96 certificates in total, 4 session of results presentation and 3 industry-university collaboration projects.



Science Park Talent Cultivation Subsidy Program

A visit to TSEC Corporation (Pingtung Plant) by students from Cheng Shiu University

A course given by an instructor from Metal Industries Research & Development Centre

The student intern was getting samples for analysis in protective equipment in ScinoPharm Taiwan, Ltd.

Students having the hands-on training of EMC-EMI

UMC's briefing in the matchmaking meeting to recruit interns

2. Professional and Technical Talent Training Program

To improve the professional and technical knowledge and capabilities of the park employees and to reserve the capacity of talents for the future advancement of the park, multiple professional courses in the fields of semiconductor, optoelectronics, precision machinery, information communication, and management that are needed for park employees and the exchange and matchmaking events were held to reserve all kinds of talents needed by the park industries and enhance the park employees' competitiveness, the innovative management thinking, and the R&D capacity. Through the construction of an exchange platform for industry-academia services at STSP, various resources of industry, government, academia, and research institutes can be more effectively utilized and integrated to give full play to the maximum benefit of resource sharing to serve the park.

(1) A total of 330 hours of courses were provided in 2 professional modules, semiconductors and smart manufacturing, with a total of 22 public classes and 21 corporate customized classes, with 1,162 trainees in total. Nearly 65% of the participants were the employees in the science park, and the lecturers from the industries accounted for 60%. The courses linked 21 enterprises and legal persons to provide services for the talents and meet the training needs at STSP.

(2) STSPB organized 3 comprehensive and 2 large-scale matchmaking activities and themed forums, with a total of 480 participants from 17 schools around Taiwan, more than 20 enterprises in the science park and surrounding areas. Through the sharing of a female leader in the high-tech industry, cross-university talent matchmaking, sharing of senior fellows, demonstrating academic and research capacities and achievement and other diverse activities, we assist enterprises to grasp the talents in multiple schools and R&D capabilities in various fields.

(3) We organized a symposium for exchanges between HR and senior executives. A total of 58 HR and business executives attended the meeting. The unveiling of the self-driving car field was arranged to let the manufacturers understand how much the talent issues are paid attention to and how we subsidize resources at STSP. In addition, the TTA South Team was introduced for the exchanges with the park manufacturers. It is hoped that through the dialogue and interaction during the event, the enterprises' needs can be grasped while at the same time, the relationship and bond can be established.

Course training- demonstration of soldering wire by the instructor

Large-scale matchmaking event- Cross-university X School of Science Research Results Presentation and Technology Exchange with STSP Enterprises – Manufacturers and the students discussed the research project results

The break time of the Sharing of Senior Fellows- the senior fellow from the InnoCare Optoelectronics interacted with a participating student

Group photo of the symposium for exchanges between HR and senior executives

3. Take Roots Downward in Education

To provide a high-quality education environment for the STSP employees' children and to lay an educational foundation for the local development, STSPB has actively preparing the experimental high schools which include the senior high school department, junior high school department, primary school department, bilingual department, and kindergarten. This is a rare system in Taiwan, and the curriculum focuses on the 12-year continuity, combining the park and social resources with the adaptation of innovative teaching model for the development of a forward-looking and internationalized benchmark school focusing on science education based on humanistic foundation, attracting international talents through the establishment of the bilingual department. In addition, we cooperate with the national bilingual plan, deepening bilingualism and internationalization to enhance student's international competitiveness. At the same time, with the expansion of the science park, we actively plan the experimental high school with proper planning of kindergarten to senior high school, and bilingual education is set up, making the experimental high school a cradle for nurturing talents and integrate industrial industry and education into life.

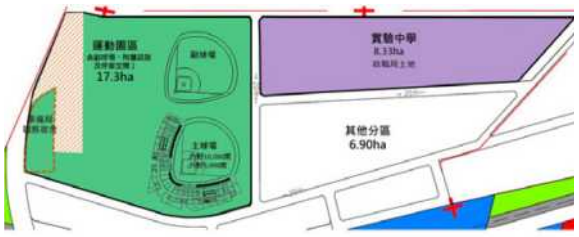
▸ The experimental high schools in Pingtung and Chiayi Technology Corridor Belt for the Nurturing of Talents

To cope with the development of the science park, the newly constructed Pingtung Science Park and Chiayi Science Park will attract investment, and a large number of technology talents at home and abroad will be attracted to the science parks, promoting the sustainable development of high-tech industry and the science parks, facilitating the prosperous development of local industries, which will greatly increase the demands for living functions and at the same time cultivate high-tech talents of the country for the future. STSPB included the promotion of the experimental high schools within (or outside) the newly constructed science park to create a sustainable living and educational environment. The plan for the establishment of the National Experimental High School At Pingtung Science Park & National Experimental High School At Chiayi Science Park was approved by the Ministry of Education on December 29, 2021, and it was agreed to establish the Preparatory Offices for the two experimental high schools on January 26, 2021. The selection of the director of the Preparatory Offices was scheduled to be held on February 25 and the directors would take office on March 1. The preparatory work was conducted actively and rapidly.

The location of the experimental high school was initially chosen to be on the north side of Pingtung Science Park with about 8-10 hectares that is close to the future sports and leisure industrial park in the high-speed rail special zone, with residential and commercial and station functions for National Experimental High School At Pingtung Science Park; for National Experimental High School At Chiayi Science Park, it is in the south side of within Chiayi Science Park base with about 8-10 hectares in area, with the Gugong Blvd. in the south, close to the services functions of the county-level special district, both with very good location conditions.

The planning of the experimental high schools and the construction of the school buildings are expected to be tendered and constructed in 2023. The first phase school buildings are expected to be completed in 2025, and the whole schools are expected to be completed in 2026. It is planned to start enrollment in 2024, and the schools are expected to start in September, 2024.

Location of the experimental high school in Chiayi Science Park



Location of the experimental high school in Pingtung Science Park

▸ FIRST Robotics Competition

To cultivate the talents the new generation of industries need, STSPB cooperates with the National Nanke International Experimental High School (NNKIEH) and actively assists the participating teams in the FIRST Robotics Competition (FRC) with the courses and exchanges as well as guidance from professional teams. The hand-on courses, intensive training camps, and the FRC simulation competitions are arranged every year to enable the education of self-manufacturing to take root downward to cultivate students to be the leaders in the fields of science and technology.

NNKIEH participated in the 2022 RFC (FIRST Robotics Competition) in Houston, USA from April 20-22, and stood out from the 454 top teams from all over the world and won the Quality Award. Before the world competition, Minister Tsung-Tsong Wu of National Science and Technology Council, the Director-General of the STSPB, Chen-Kang Su and the representative team were summoned by the president on April 12, and the vice president Ching-Te Lai presented NNKIEH with the flag and encouraged the students to keep working hard and continue to become Taiwan's pride with technology and cooperation. NNKIEH's FRC6998 Team was the only winning team from Taiwan in this world competition. When the teachers and students at NNKIEH learned the news of winning an award, they were all excited by the great results in the world competition.

Group photo of NNKIEH's FRC6998 Team at the Presidential Office

NNKIEH won the Quality Award in the 2022 RFC


總統賀電

Congratulatory message of the award-winning news

In the second half of the year, the advancement and FRC-related training continued. A 5-day STSP FRC Summer Training Camp led by two NNKIEH teachers, Wen-Hung Tai and Yun-Shan Liu and co-planned by Dr. Ching-Tsai Wu of the Metal Industries Research & Development Center was held from August 8-12. Professional lecturers from TFRCG (Taiwan FRC Graduates) were hired to design and plan the FRC learning courses, and the content of the courses included introduction of FRC, introduction of basic tools and processing machines, mechanism design and manufacturing, robot programming and robot production. At the same time, an alliance competition was also arranged so that the students could not only learn the professional knowledge and skills of FRC but also experience the FIRST competition spirit. The students came without knowing too much when they first arrived. However, on the last day when they completed the robot team competition, their imagination and creativity stimulated by the STEM education can be seen. Although it was planned and implemented during the epidemic period, it was gratifying to see that the students all showed confidence and had smiles on their faces.

The closing & award presentation ceremony of the Alliance Competition on Day 5

+ Promote Technological Upgrading and Expand Industrial Clusters

Other core goals involved

17 PARTNERSHIPS FOR THE GOALS

Implementation content and promotion results

1. Precision Health Industrial Cluster Promotion Project in Southern Taiwan

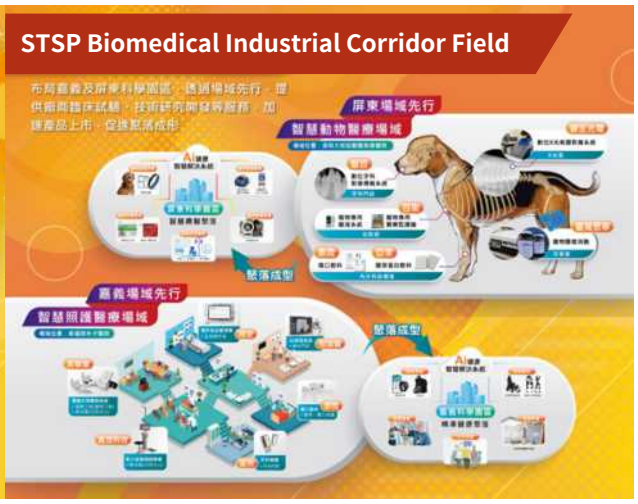
There are currently around 90 manufacturers stationed in the biomedical cluster in STSP, which is one of the domestic biomedical clusters for key development. During the past decade of development, the biomedical manufacturers at STSP have been successively assisted to pass the verification of Taiwan Food and Drug Administration (TFDA) and Medical Device Quality Management System (QMS), and also obtained the FDA and CE certification. In order to support manufacturers to continue to take root locally and grow steadily, and to lead the medical material cluster to step toward the international stage, it is imperative to assist manufacturers to break through the marketing difficulties.

To construct a STSP-centered medical device cluster with characteristics

To promote trust-based clinical experience

To develop innovative technologies and products based on precision health industry

To establish an integrated industrial alliance- based marketing model



The Precision Health Industry Cluster creates more than NTD10 billion in the output value every year (the turnover in 2021 was NTD 13.4 billion and 12.7 billion in 2022). To promote the cluster development, STSPB continues to promote MIT medical materials through the Precision Health Industrial Cluster Promotion Service Platform in Southern Taiwan, and has established 12 experimental diagnosis lines in 8 medical institutions, and an education and training center in 7 medical schools. In addition, the park biomedical manufacturers were also led to participate in Healthcare Expo Taiwan, Bio Asia-Taiwan Exhibition, Dental Show Announcement, and MEDICA and other domestic and foreign trade fairs. In addition, the overseas operation base of the Southern Taiwan Science Park Medical Device Promotion and Operation Center was established in Malaysia, contributing to the signing of Memorandum of Cooperation among Metal Industries Research & Development Centre, Denway, Kuala Lumpur International Dental Centre (KLIDC), and Formosa Association for the Promotion of Oral Biotechnology and Medical Devices (TAPO). In the future, we will continue to connect resources from different parties to strengthen Taiwan's medical material industry so as to align with international standards. At the same time, the STSP Digital Dental Demonstration Clinic was established in Taipei Denway Clinic in northern Taiwan and Tungs' Taichung MetroHarbor Hospital in central Taiwan. Under the influence of the COVID-19 epidemic, STSPB assisted manufacturers with promoting products via multiple marketing modes online and off-line. Moreover, to install the Smart Care Medical Fields" and

"Smart Animal Medical Fields" in Chiayi and Pingtung Science Parks, services such as clinical trials and technology R&D are provided to manufacturers in a field-first manner to accelerate the launch of products, facilitating the formation of a cluster while extending the Biomedical Industrial Corridor in southern Taiwan.

▸ STSP Industry-Academia-Medical Exchange Platform

STSPB and the Medical Device Innovation Center, NCKU jointly established the STSP Industry-Academic-Medical Exchange Platform. The first biomedical exchange and matchmaking event was held on March 31, with doctors and nurses from National Cheng Kung University Hospital and representatives from outstanding biomedical manufacturers at STSP, such as AcuSense BioMedical Technology Corp., Hung Chun Bio-S Tech, Healthconn, TAICEND TECHNOLOGY, Tung Sin Biomedical, and Hwa Meei Optical.

STSP Industry-Academic-Medical Exchange Platform is the first exchange and matchmaking platform with the biomedical manufacturers in STSP and the medical team of National Cheng Kung University Hospital, connecting the fields in the industry, academic, and the medicine. The purpose is to enhance the familiarity with and trust in medical material products manufactured at STSP for future physicians, forming a smooth product trial channels for the access to the hospital procurement system, enabling future physicians to understand the medical materials made domestically for the promotion of the localization of medical materials.

Through the platform matchmaking, the STSP biomedical manufacturers, the nurses and physicians from National Cheng Kung University Hospital, and the professor teams can make more effective exchanges and collection of the needs and feedback of the users to discover the unmet clinical needs for the joint discussion on solutions. In addition, the medical material manufacturers are also assisted in finding the technical R&D direction to jointly promote the upgrading of the domestic smart medical industry.

The first exchange and matchmaking event held by the STSP Industry-Academic-Medical Exchange Platform

2. Science Park Emerging Technology Application Project

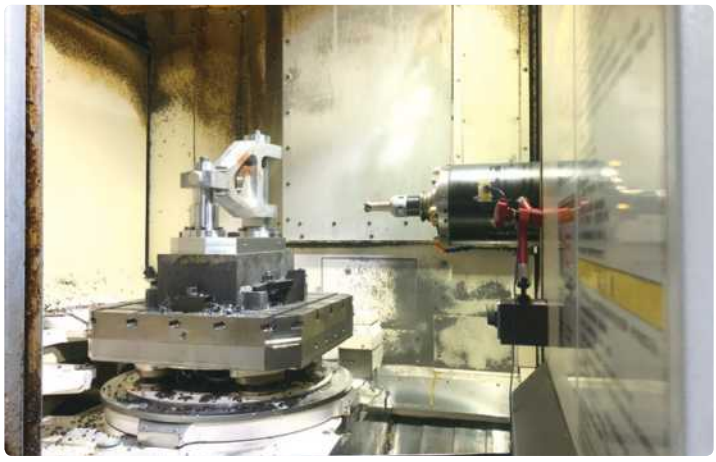
To implement the main axis of the high economic efficiency and industrial innovation policy to encourage scientific businesses to form alliances with different industries or the academic circles to jointly engage in the R&D of emerging technologies, STSPB started the promotion of Science Park Emerging Technology Application Project in 2021 to introduce the energy from academic and research institutes while forming industry alliances based on industrial needs to facilitate the joint engagement in the development of industrial integration and key technologies. The aim is to promote talent cultivation for innovative technology, solve market problems, nurture start-ups and create talent value to achieve the win-win situation for innovative transformation of industries and the synergy of derivative industries.

The final decision was made to approve subsidies to the 2022 R&D projects of 8 manufacturers in biotechnology, optoelectronics and precision machinery, with a total subsidy amount of NTD 26.98 million.

Number of journal papers (including technical reports)	Number of talents cultivated by academic and research institutions	Number of derivative patents		Number of technical transfers	Science Park Emerging Technology Application Project
		Number of application	Number of patent obtained		
61	33	18	2	0	

▸ Emerging Technology Application Project Opens up a New Era of Digital Optimization

In the next 20 years, the global demand for single- aisle passenger aircraft will account for more than 70% of the civil aviation market. The Airbus A320/A321 series belongs to the single-aisle passenger aircraft, and is the main model of Airbus. Magnate Technology Co., Ltd. is a manufacturer of STSP Kaohsiung Park, which stepped into the aerospace field and started to manufacture the civil aircraft parts in 1995. The global aerospace industry supply chain was impacted by the COVID-19 epidemic. In 2021, the aerospace industry-related products declined from about 75% of the revenue in previous years to 47%. By applying for the STSP Emerging Technology Application Project, Magnate Technology worked with the research team of professors of NCKU and developed the intelligent tool wear monitoring technology that is applied in the production line of Airbus A320/A321 series civil aircraft landing gear parts. In this project, smart manufacturing technology was introduced for the digitally optimization process to monitor the wear and service life of the key tools in the production line, which greatly reduces the occurrence of emergencies that need to be handled in the case of tool abnormalities, improving the production technology capabilities of civil aircraft landing gear components and expanding the strategic partnership with international major manufacturers for increased cooperation oppor-tunities.



A microphone is set up inside the machine to monitor and detect the status of the tool

+ Construction of a Safe and Friendly Workplace Environment

Other core goals involved

Implementation content and promotion results

1. Advocacy on Gender Equality in Employment

The number of employees in STSP has reached 92,601 in 2022, including 57,999 males and 34,602 females, with the ratio of male to female at about 6:4. To promote gender equality at work and establish a more stable working conditions and environment, the park manufacturers' knowledge and understanding of the Act of Gender Equality in Employment and the prohibition of employment discrimination are strengthened. In addition to making gender equality promotion short films, STSPB also organized workshops inviting professionals to have lectures on the Act of Gender Equality in Employment and Case Study of Sexual Harassment in the Workplace and Employment Discrimination. These workshops can be useful for HR personnel to handle related issues in the future. The publicity was also strengthened in large-scale events with promotional posters and publicity materials provided. Business units were also encouraged to actively participate in publicity briefings to further assist them to build a friendly workplace and facilitate labor-management harmony.

(1) Slogans and messages concerning gender equality in employment are shown on the electronic bulletin board in the science park from time to time, and relevant propaganda and materials about gender equality in employment and a friendly workplace are posted on Facebook Fanpage and published in the Southern Taiwan Science Park Newsletter.

(2) Materials are made for the promotion of gender equality cases (including propaganda short film) to provide HR staff in the science park with materials for law propaganda targeting at labors and basic-level management for them to abide by the laws and regulations. In 2021, 8 sessions of playing the propaganda short film on gender equality before the movies were arranged on STSP Movie Night, and the contents of the short film included parental leave without pay, childcare allowance and CEDAW promotion to strengthen the promotion of the gender equality concept.

(3) In 2021, the Cheering Station for Gender Equality in Employment was established in 3 sessions of large-scale events(1/16、3/26、7/2), and questionnaire was designed to interact with the public on the spot, coupled with explanations of laws and regulations concerning gender equality in employment and employment discrimination (approximately 465 copies of questionnaire were completed in total).

(4) We planned a “Workplace Equality Zone” in large-scale talent recruitment events to introduce the winners of park manufacturers implementing workplace equality, sharing various friendly measures and practical experiences to enhance the corporate image of the manufacturers.

(5) We organized 2 sessions of “Workplace Equality and Sexual Harassment Prevention Seminar” in Tainan Science Park and Kaohsiung Science Park each on June 15 and October 21 respectively, with 56 representatives from 46 manufacturers participating. Attorneys and judges were invited to have lectures on relevant laws and sexual harassment prevention through case study, hoping to enhance these business personnel’s professional knowledge and facilitate equality in the workplace.

Propaganda short film on gender equality played before the movies on STSP Movie Night

Propaganda on the friendly workplace on the Facebook Fanpage

STSP Newsletter published reports on gender equality in employment

Cheering Station for Gender Equality in Employment

Workplace Equality Zone

Workplace Equality and Sexual Harassment Prevention Seminar

▸ Promotion of Recognition of Workplace Equality in the Science Park

To safeguard labor rights, promote a friendly working environment, facilitate harmony between labor and management to reduce labor disputes, and to commend park employees for their contribution to the construction and economic development of STSP, the Bureau organizes the Award-Giving for Promotion of Work Equality in the Workplace for excellent business units and Excellent Employees in Southern Taiwan Science Park to encourage enterprises to actively implement labor laws and regulations and construct a harmonious working environment. In 2022, a total of 68 excellent employees and 4 manufacturers promoting work equality in the workplace won the awards.

▸ Gender Discrimination Cases

To provide legal assistance for employees or job seekers who are in gender equality lawsuits, the Bureau has set a fund of NTD 50,000 for legal assistance in gender equality lawsuits and set up a review team for legal assistance of gender equality cases. The committee is composed of 7 committee members, with 3 female and 4 male representatives, including 4 external experts, and is in charge of reviewing relevant subsidies of lawsuits. There was no application for the fund in 2021.

In 2022, the Bureau convened 1 sessions of Gender Employment Equality and Employment Discrimination Review Committee to discuss issues concerning Act of Gender Equality in Employment, discrimination cases violating Employment Service Act and complaints of sexual harassment in the workplace as well relief channels to safeguard the rights and interests of the complainants. Among them, the reviewing process of 3 case of sexual harassment in the workplace were completed to safeguard the rights of the complainant to promote a friendly workplace and environment in the science park.

2. Family Care and Support

The establishment of the childcare facilities is conducted in accordance with the amended Act for Establishment and Administration of Science Parks. It is open to childcare institutions outside the science park to establish appropriate childcare facilities in the science park. The Bureau provides the venue for rent at preferential rates for the childcare facilities to enable the employees to arrange childcare so that they can concentrate on their work while working, achieving a balance between work and the family.

The Bureau also provides counseling for the park business units to provide childcare measures and breastfeeding rooms to implement a friendly workplace. A total of 30 park manufacturers received the counseling in 2022. In addition, subsidies for childcare facilities and measures are also budgeted every year to assist business units to handle these measures, encouraging them to create a safe workplace and family life for the workers at STSP. As of December, 2022, a total of 73 business units with 100 employees and more have provided childcare measures and breastfeeding rooms in accordance with regulations.

▸ High-quality education and childcare setting the employees' mind at peace

To create a friendly working environment in the park, Tainan Science Park and Kaohsiung Science Park have set the Little Bear Baby Care Center specially designated for the growth and learning of 0-2-year-old babies. In 2022, with the provision of friendly preschool education services as the starting point, it is expected to further provide parents with kindergarten childcare services for children aged 2-6 years old. The parents will pay NTD2,000 for 1 child per month, NTD1,000 for the second, and free of charge for the third child or above or children from low-income families. Extended childcare services are also provided to reduce the burden of parental childcare so that parents working in the science park can go to work with peace of mind.

Tainan Science Park

Nonprofit Kindergarten for Children of Community Center Employees	STSPB will turn the private My Dear STSP Kindergarten in the community center to a non-profit kindergarten, and the TMD EAPA was entrusted to be in charge of the education and childcare services starting on August 1, 2022. At 15:00 pm on August 17, the opening ceremony was organized, starting to provide childcare services for the employees' children.

STSP Lianyuan Non-Profit Kindergarten	STSPB and UMC jointly built the STSP Lianyuan Non-Profit Kindergarten, officially opened on October 17, 2022. Peng Wan-Ru Foundation is entrusted to provide the friendly education and childcare services with “high-quality education and childcare, affordable price, communication integration, and integration of professional resources”. The classrooms are spacious, comfortable and bright, and looking out from the windows, the students and teachers are surrounded by the greenery, enabling physical and mental comfort.

Ribbon-cutting ceremony of the Nonprofit Kindergarten for Children of Community Center Employees


The environment of the STSP Lianyuan Non-Profit Kindergarten is spacious, comfortable, bright, and warm.

Kaohsiung Science Park

Luer Childcare Center	STSPB introduced Luer Childcare Center into the park through bidding and self-construction for the establishment of a high-quality childcare center. The groundbreaking ceremony was held in the mornining on April 7, 2022, and it is scheduled to be open for operation in August, 2023. Priority will be given to enrolling the children and grandchildren of employees in Kaohsiung Science Park. It there is still quota, children of residents living around the Kaohsiung Park will aslo be accepted. In the future, quasi-public kindergartens will aslo be added so that parents and children can enjoy affordable, high-quality, diversified, and stable development of education and childcare services.


The groundbreaking ceremony of Luer Childcare Center was a great success

Park manufacturers also have their own kindergartens and cooperate with the National Experimental High School that provides high-quality education environment for employees' children aged 6-18. In the future, it is also planned to open kindergartens and experimental high schools in newly established science parks so that the talents can work with peace of mind in the science park for their development while their needs for living and for children's education can also be met.

3. A Safe and Healthy Park

STSPB is devoted to creating a safe and healthy science park and developing high-quality labor force to enhance the employees' attention to and efforts for a safe and healthy working environment in the workplace. In terms of the occupational safety and health, STSPB focuses on creating a sustainable working environment of a healthy and safe smart park.

▸ Increase health care penetration rate

The Employee Clinic of Southern Taiwan Science Park is the first medical service team from private medical center to be introduced among government-developed industrial zone and science parks, providing medical services and health consultation for employees of park manufacturers and the neighboring residents. The Employee Clinic of Southern Taiwan Science Park provides timely professional consultation and epidemic prevention guidance for park manufacturers from pulmonary tuberculosis in the past, to SARS, H1N1, H5N1 and even to the outbreak of the COVID-19 pandemic. It provides a full range of medical services, successfully playing the role of family physician in the big family of STSP.

The firstly established workplace ecosystem in the health park combines the strengthening of workplace safety and health of the Occupational Safety and Health Administration of Ministry of Labor, the Healthy Workplace Certification of the Health Promotion Administration of Ministry of Health and Welfare, and Sports Enterprise Certification of the Sports Administration of Ministry of Education. In 2018, the "Health Park, The First Year of Sports" was promoted to establish a healthy workplace ecosystem in the science park. We invited Tai Tzu-Ying as the spokesperson from the year 2019 to 2021 and organized neighborly ball games and night runs to create a healthy and sporty atmosphere at STSP.

In addition, in accordance with Article 22 of the Occupational Safety and Health Act, we focus on whether the manufacturers that should hire or employ contract medical personnel have allocated medical personnel as prescribed by law and whether they have handled labor health protection matters such as conducting labor health management, prevention of occupational diseases and handling health promotion. STSPB organizes the workplace health promotion counseling and established the STSP Safety and Health Guidance Group whose member includes doctors from park clinics, senior nurses from park manufacturers, and experts in the academia to provide on-site counseling on the management and protection of workers' physical and mental health in the manufacturing and construction industries in the park.

The number of counseling sessions in the plants for the past 3 years (2020~2022) reached 178

Manufacturing safety and health	Construction industry	Health promotion projects
39 sessions	113 sessions	26 sessions

In addition, according to the statistics of the Labor Health and Protection Management Reporting Information System of the Health Administration of Occupational Safety and Health Administration of Ministry of Labor (as of the end of December, 2022), the overall health service rate of the science parks within STSP has reached 100% (the number of manufacturers that should employ or contract medical personnel was 117 to serve a total of 88,920 employees. Among them, 117 manufacturers completed system filing, serving 88,920 employees. The service rate was 88,920/88,920 ＝ 100%).

▸ Improvement of the Safety of Working Environment through On-site Counseling

STSPB has been devoted to the disaster prevention and relief work through actively counseling and on-site inspection of the park manufacturers, which will effectively reduce the occurrence of occupational disasters and will be of great help in the protection of the life, safety and health of the employees in the science park. On-site counseling mainly targets at the key points in the construction and manufacturing industry in the science park. The more business units that are stationed in the science park, the more plants that are going to be built.

In response to the high frequency of occupational disaster in places with high risks, such as Class A and C dangerous workplaces and the construction sites in the park, we started to promote the “On-site Counseling of Occupational Safety and Health” by integrating resources in the industry, government and academia to form an Industrial Safety Counseling Team to assist with the implementation of self-management of occupational safety and health at high-risk places so as to reduce the occurrence of occupational disasters. In 2022, a total of 80 sessions of counseling were conducted, which included:

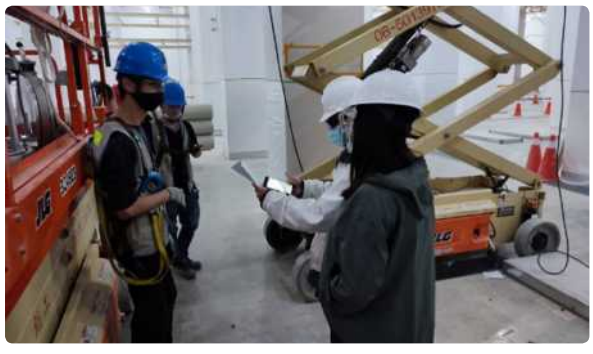
1. 1 sessions of on-site counseling of occupational safety and health in Class A and C dangerous workplaces.
2. 10 sessions of on-site counseling for physical and mental health management and protection.
3. 16 sessions of on-site counseling of occupational safety and health in the manufacturing industry.
4. 53 sessions of on-site counseling of occupational safety and health in the construction industry.

On-site counseling in Class A and C dangerous workplaces

Counseling of physical and mental health management and protection

Counseling of manufacturing industry

Counseling of manufacturing industry



Manufacturing Industry/ TSMC Fab 18 New Construction Project (P7)

Manufacturing Industry/Garuda Technology Co., Ltd. (Counseling of manufacturing industry)

A total of 3 sessions of propaganda meetings were held, focusing on not only the explanation of the key points of on-site counseling but also the education and training concerning the scaffolding construction standards and operation safety, open excavation work safety, regulations for anoxic work in confined spaces that often occur in the construction sites, explanation of labor health protection regulation amendment, matters to be noted in practical promotion, recommendation and guidelines for the disclosure of SDGs of sustainable health and safety in the workplace, etc. It is hoped that through the comprehensive propaganda meetings, the quality of the business units and the employees in the science park can be enhanced, their self-health management can be improved and the occupational accidents in the science park can be reduced, reaching a win-win-win situation.

Occupational Safety and Health Promotion Seminar

Safety and health symposium for senior -executives at the construction site in the park

Workplace sustainable health and SDGs promotion seminar

▸ Excellent Industrial Safety Unit (Personnel) Award

The Bureau promotes occupational safety and health in the science park through advocacy, guidance, and implementation of labor inspections to effectively improve the safety and health standards in the science park. Through the pre-assessment mechanism, the business units' self-management can be enhanced and the full participation mechanism can be expanded to promote the efficiency of the labor health and labor inspection so as to construct a safe, healthy and humanized working environment. To publicly commend the business units and employees with excellent occupational safety and heath management to encourage the improvement of workplace safety standards and promote labor health and safety so as to carry forward the diligent and sociable spirit and the excellent tradition of moral character, we commend excellent employees and business units every year. In 2022, 4 manufacturers and 10 employees in the science park won the award.

Group photo of the winners

4. Maintaining the death rate per million workers in major occupational disasters at 20 and lower (reaching Japanese standards)

We have been devoted to the promotion of various disaster reduction plans and investigations to have thorough grasp of the high-risk places in the science park and advocate the importance of occupational disease prevention. To ensure the occupational safety of the workers, we further help the construction sites implement the establishment of self-management, which effectively reduces the potential disasters in the park while on the other hand improves the industrial safety standards in the science park.

In 2022, a total of 986 labor inspections were completed (including 896 sessions of occupational safety and health inspections and 90 sessions of labor condition inspections), The occupational disaster rate per thousand people in the science park in 2022 was 1.33‰ .

Item	2018	2019	2020	2021	2022
Occupational disaster rate (per thousand people)	1.39	1.14	1.08	1.09	1.33
Disabling Frequency Rate (FR)	1.30	0.55	0.55	0.55	0.68
Disabling Severity Rate (SR)	17.20	7.80	5.30	44.80	11.4
Death rate of major occupational disaster (per million people)	0	0	0	11.9	0

Note:

1. Disabling frequency rate (FR) and disabling severity rate (SR) were calculated based on the announcement stipulated by Occupational Safety and Health Administration.
   (1). FR = (Total number of people injured x 1,000,000) ÷ total hours worked
   (2). SR = (number of work days lost x 1,000,000) ÷ total hours worked
2. The unified data does not include construction industry figures, as construction workers in the industrial park are not employees of the park's business units.

Labor inspection

In 2022, there were accidents where object collapsed and the worker was crushed, and accidents where workers were hit and fell in the park ,STSPB dispatched personnel to the site for labor inspection and demanded that the work suspended in accordance with the emergency response procedures for major disaster accidents in the park, followed by relevant procedures for notification of workplace disaster and related investigation and punishment in accordance with the Occupational Safety and Health Act. Business units were also advised to strengthen works for occupational safety and health protection as well as management of various operations.

1. Analysis of the causes of accidents

Collapse of objects	The retaining support was not provided in the excavation work of a construction project.
Accident where worker was hit	When the workers were engaged in hanging steel materials and preparing the safety nets, there was no commander at the scene, so the victim was accidently collided when the 12.5-ton forklift moved backwards.
Accident where worker fell	The worker was conducting the return air duct installation on the 1st floor, and such worker did not wear high-altitude protective gear and did not pay attention to the opening in the area, resulting in his fall to the ground of Basement Level 1.

2. Follow-up improvement measures:
   (1) Collect and prepare information of the disaster cases in the park and strengthen the key points in labor inspections and publicity meetings for relevant business units to prevent similar accidents from happening again.
   (2) Regularly arrange experts and scholars to assist in occupational safety and health inspections of the park factories and construction projects and strengthen the guidance for manufacturers that had occupational accidents for improvement, such as planning the traffic flow and guiding the personnel, adding a rear-view camera to the forklift to assist with the drivers' visual blind spots.

5. Advanced Disaster Education and Training Center

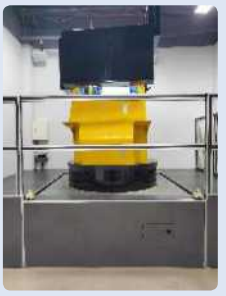
To enhance the workers' occupational safety and health knowledge and the ability to identify hazards, the Occupational Safety and Health Administration of Ministry of Labor and STSPB jointly promote the "Occupational Safety and Health Multi-somatosensory Extended Reality (XR), Disaster Prevention Simulation Training Field Project". The existing buildings of Kaohsiung temporary storage site was used and refurbished. After 3 years of installation of relevant hardware and software equipment, the first-class domestic Occupational Safety and Health Multi-somatosensory Extended Reality (XR), Disaster Prevention Simulation Training Field was established. Through the high technology of VR, AR, MR, AIoT, high-risk operations in places like the roofs, construction frames, high-altitude operation vehicles, chemicals, forklifts, confined spaces, and hanging cages can be simulated for learners to receive the interactive and immersive training in a safe environment. It is hoped that the trainees can work safely in their workplace after the training.

XR Field Space Planning

After completing the establishment of the XR software platform and 4 sets of occupational accident simulation training courses, including confined space operation, construction framework operation, high-altitude operation vehicles, silane gas cylinder replacement operation, technologies such as VR and AR as well as the equipment enable the trainees to be familiar with the standard operating procedures of these operations. These trainees' safety awareness is strengthened because they learn that if the safety measures are not fully implemented, occupational accidents may occur. In 2022, a dynamic platform and corresponding occupational accident simulation training courses were further established, including the simulation of the common forklift operation, the use of robotic arms to simulate the hanging cages used in high-altitude operations that have been commonly used in recent years, as well as the establishment of a 360-degree rotating somatosensory machine to simulate the roof operations that are prone to falling accidents. The dynamic equipment built in the field is combined with each other to enable the trainees to know the potential dangers in the workplace.

1.Simulated forklift

Forklifts are indispensable material handling equipment in various industries. However, occupational accidents often occur due to the excessive operating speed, obstructed driving vision, and unidentified working environment and work hazards. In view of this, the simulated forklift operation is applied for the trainees to improve their hazard identification abilities and the cultivation of good operating habits to effectively prevent forklift operation accidents.


The exterior of the simulated forklift


3D modeling of the exterior of the simulated forklift


The simulation content of the training module

2. Robotic arm

There are more and more high-rise buildings with curtain glass, and the temporary and dynamic operations such as exterior wall cleaning or repair also increase. The robotic arms can simulate the most commonly used hanging cages for the trainees to experience the hazards of falling from high altitudes, and their independent safety management is also strengthened to eliminate risks and avoid occupational accidents.

The exterior of a robotic arm

3D modeling of the building exterior

Contents to check before the operation

3.The 360-degree rotating somatosensory machine

Due to the convenience of construction and the climate in Taiwan, lightweight materials such as asbestos tiles, corrugated plastic sheets, and lighting covers are widely used on the roofs of residential buildings and factories. However, these materials are fragile, easy to age and become brittle, and therefore, it is very easy to “step through” them when working on the roof, resulting in a falling accident. The 360-degree somatosensory machine is used for trainees to understand the potential hazards and related operating procedures for the prevention of falls.

The exterior of the 360-degree somatosensory machine.

3D modeling of the roof work

A total of 77 sessions of education and training were organized in 2022, and the cumulative number of trainees was 1,583. There were 22 sessions of visits from schools and government agencies, with a total of 659 visitors. The XR field will continue to develop courses for the Occupational Safety and Health Multi-somatosensory Extended Reality (XR) Simulation Training and continue to promote the cooperation among the industry, government, academia and cross-ministerial collaboration to create a safe, healthy and sustainable high-tech industrial corridor in Southern Taiwan.

Advanced Planning

STSPB is dedicated to creating high-quality investment and employment environment. Through rewarding innovative research and development and deepening industry-academia collaboration, the output value of the park and quality of talents have increased. With the improvement of the public's quality and labor awareness, workers not only pay attention to their career development aspects, but also the conditions such as occupational safety, labor rights, education, health care and others when they make overall consideration of employment. Therefore, STSPB also actively promotes gender quality in the workplace, labor inspections, occupational safety and health counseling, and training of disaster prevention to make STSP a smart, innovative, and healthy park.

In addition, to solve the problem of schooling for employees' children, in addition to the existing NNKIEH and the National Experimental High School at Chiayi Science Park and National Experimental High School at Pingtung Science Park that are still under planning, STSPB also responds to the government's policy of encouraging childbirth by opening appropriate locations for childcare institutions outside the park to set up childcare facilities in the park area to assist employees in the park achieve a balance between work and family.

Core Goal 17

Goal 17 Establish diversified partner-ships and work together to advance the vision of sustainability

Self-defined tracking indicators	Authority
Exchanges and sharing are made through receiving visitors at home and abroad and participating in various large-scale exhibitions	Investment Promotion Section、Industry-Academic Research and Development Section

Challenges/opportunities faced

To enable the park to achieve sustainable operation and assist the development of industrial clusters, STSP Bureau attaches great importance to establishing close relationships with partners in all sectors, linking international markets and resources, participating in international exhibitions and fairs, as well as having exchanges with overseas enterprises to understand the development trends of the industry and the latest technologies and discuss possibilities for cooperation opportunities and common development, so as to attract more foreign enterprises to enter the park, facilitating the internationalization of the park and promotion of the park development.

Specific actions and promotion highlights

+ Domestic and Foreign Exchanges and Industrial Links

Implementation content and promotion results

As the condition of COVID-19 epidemic eased, STSPB faced a peak of visitors at the end of 2022. The semiconductor and biomedicine industries in the park continued to show strong development momentum, attracting many visiting groups to STSP for exchange. According to statistics, a total of 48 groups with 951 visitors visited STSP in 2022 alone, an increase of 30% compared with the previous year. This also demonstrated the importance and influence of STSP in the industry. STSPB will continue to strengthen cooperation and exchanges with all parties to promote the innovative development and upgrading of the park.

Jan	The Winter Camp for college students- A Visit to STSP
Feb	The Winter Camp for college students- A Visit to STSP (Sandra Oudkirk)Director of American Institute in Taiwan, Ms. Sandra Oudkirk, led the visiting group to visit STSP Principal and teachers of Kaohsiung Municipal Cieding Primary School
Mar	Alpha Ring International (WI Harper) Former Director-General of Construction and Planning Agency Yi-Hou Lin and distinguished guests Vice CEO of Tunlin-Chiayi-Tainan Joint Services Center, Executive Yuan and distinguished guests
May	Department of Electrical Engineering, National Chiayi University Director-General of German Institute Taipei, Mr. Jörg Polster, led the visiting group Department of life science, National Chung Hsing University

Jun	Mr. Chih-Cheng Yeh, Director General of Department of International Cooperation and Science Education, NSTC, and three Division Directors of Diplomatic Missions paid an official call on STSPB
Jul	The Summer Camp for college students- A Visit to STSP
Aug	The Summer Camp for college students- A Visit to STSP Rotary Club
Sep	Exchange students from Academy of Innovation Semiconductor and Sustainable Manufacturing, NCKU Cross-Strait Relations Young Student Camp
Oct	Department of Electrical Engineering, National Chiayi University Delegation led by German-Taiwan Parliamentary Friendship Group Chairman Klaus-Peter Willsch Department of Urban Planning of NCKU Hsing Hwa Senior High School of Chiayi City
Nov	Workshop on Smart Epidemic Prevention of Medical Device Innovation Center, NCKU Teachers and students from Semiconductor Optoelectronics Process Program of National University of Kaohsiung Dept. of Information Management, Hsiuping University of Science and Technology EMBA relocation teaching in the south, National Changhua University of Education Chung-cheng Chen, Director General of Taiwan-Japan Relations Association led the visiting group to pay an official call on STSPB

Director of American Institute in Taiwan, Ms. Sandra Oudkirk, led the visiting group to STSP Tainan Science Park and paid an official call on Director-General of the STSPB, Chen-Kang Su (2022.02.18).

Director-General of German Institute Taipei, Mr. Jörg Polster, led the visiting group to STSP Tainan Park (2022.05.17)

Mr. Chih-Cheng Yeh, Director General of Department of International Cooperation and Science Education, NSTC, and three Division Directors of Diplomatic Missions paid an official call on STSPB (2022.06.17)

Exchange students from Academy of Innovation Semiconductor and Sustainable Manufacturing, NCKU (2022.09.01)

Smart Healthcare and Technology Visiting at Luzhu Science Park and the iBIOMED FLAGSHIP HALL by Workshop on Smart Epidemic Prevention of Medical Device Innovation Center, NCKU (2022.11.04)

EMBA relocation teaching in the south, National Changhua University of Education and visited STSP Tainan Science Park (2022.11.07)

Chung-cheng Chen, Director General of Taiwan-Japan Relations Association led the visiting group to pay an official call on STSPB (2022.11.26)

Stéphane Lessard, Executive Director of Global Affairs Canada and Science, Technology & Innovation led a group of distinguished guests to pay an official call on STSPB (2022.12.2)

CEO of Wiwynn, Li-Ning Hong, led the visiting team to pay an official visit to STSPB and Tainan Science Park (2022.12.7)

Ambassador of the Republic of Honduras, Harold Burgos and a group of distinguished guests paid an official call on STSPB (2022.12.13)

Honorary Special Advisor, TOSHIHIKO Kanayama of NSTC-JST Workshop, National Institute of Advanced Industrial Science and Technology (AIST) led a group of distinguished guests to visit STSP Tainan Science Park (2022.12.20)

Aviv Doron, Economic Consul, Head of Israel Economic and Trade Mission in Taipei visited STSP Kaohsiung Science Park (2022.12.23)

▸ Visit by German-Taiwan Parliamentary Friendship Group

German-Taiwan Parliamentary Friendship Group Chairman Klaus-Peter Willsch led a parliamentary delegation to Taiwan, and the delegates included five deputy chairs of the parliamentary friendship group, accompanied by the German Institute Taipei. The delegation visited Tainan on Day 4 (October 5). In addition to meeting Tainan City Mayor Wei-Che Huang, the delegation also visited Anping Old Fort and STSP Tainan Science Park. In view of the fact that the net zero emission policy has played an important role in the world, coupled with the long years of implementation of energy transition policy in Germany, the delegation members and STSPB exchanged a lot of experience on green energy issues. STSPB also introduced the delegation the high-tech corridor of Southern Taiwan, science park development and the construction of a sustainable environment. The two sides had exchanges on issues such as Taiwan's science park's operating model, information security, innovation, and talent cultivation.

During their visit to STSP, the German-Taiwan Parliamentary Friendship Group also visited Chieftech Precision Co., Ltd, a park manufacturer specializing in precision machinery manufacturing. The company demonstrated the front-end technology of miniature linear guide components manufacturing and explained the industrial development, and it is hoped that there will be more opportunities for cooperation with related industries in Germany. While visiting the Museum of Archaeology, the delegation member also expressed their strong interest in Taiwan's history and culture, and they also praised the achievement of preserving prehistoric culture and assets and the research on it. At the end of the visit, Chairman Klaus-Peter Willsch exchanged gifts with the Director-General of the STSPB, Chen-Kang Su, and he also expressed his expectation to continue deepening relevant exchanges and cooperation between Taiwan and Germany.

Group photo of the visiting group led by German-Taiwan Parliamentary Friendship Group Chairman Klaus-Peter Willsch

▸ Taiwan Display Union Association (TDUA) and Taiwan Electronic Equipment Industry Association (TEEIA) visited STSP

To promote cross-domain collaboration between the electronic equipment industry and the smart medical material industry, Taiwan Display Union Association (TDUA) and Taiwan Electronic Equipment Industry Association (TEEIA) visited the iBIOMED FLAGSHIP HALL in Kaohsiung Science Park on October 18. Deputy Director-General Ms. Hsui-Jung Cheng received the visiting group and also invited park manufacturers (GeneOne Diagnostics Corporation, Acusense, MobioSense, Acrobiomedical) to have exchanges. By giving detailed introduction of all the medical material products in the iBIOMED FLAGSHIP HALL, the visitors had a better understanding of the results of the development of the cluster of the biomedicine industry in the park.

Group photo with the distinguished guests

+ Joint Participation in International Exhibitions

Implementation content and promotion results

1. 2022 Bio Asia Taiwan

STSP Bureau joined hands with CTSP Bureau, Taiwan Instrument Research Institute of National Applied Research Laboratories and other institutions and participated in the 2022 Bio Asia-Taiwan Exhibition held on July 28-31 in Taipei Nankang Exhibition Center Hall 2. This joint participation was curated in the form of science-park-themed pavilions incorporated with the elements of “telemedicine, precision health, and industrial leaps”, and the R&D results of each institution served as the new visions of the ripple center that led the park manufacturers to expand their domestic and overseas markets by displaying high-quality products and the R&D technologies.

At the 2022 Bio Asia-Taiwan Exhibition, STSPB joined hands with the 12 park manufacturers while the Start-up Workshop led 8 start-up teams and 5 colleges and universities of the GLORIA 2.0 X South Platform to showcase the innovative technologies, displaying the cutting-edge medical materials and biotechnology products at STSP.

Huang Liang Precision Enterprise Co., LTD.

displayed dental implants, orthodontic screws, orthopedic bone screws, and bone plates. These medical grade products conform to ISO 13485 validated process for titanium color surface treatment, and their sizes are easy to be identified. These products are beautiful and distinctive.

LightMed Dental Technology Corp.

self-developed and produced the Er:YAG Dental Laser that can lower patients' fear of dental treatment, reduce postoperative bleeding, and shorten postoperative recovery period.

Chung Yo Materials Co., Ltd.

specializes in the production of titanium, cobalt-based and other mental powder. It is Taiwan's first metal powder manufacturer for 3D printing, and has the professional technology of customized metal 3D printing.

KAIWOOD Technology Co., Ltd.

specializes in the design and mass production of customized rapid test reagent readers. The application of products can be applied in the fields of medical treatment, food safety, and health care and prevention.

Bionet Corp.

obtained multi-national patents for the immune regulation mechanism of the mesenchymal stem cell (MSC), and provides the Exosome and CDMO services. It is the first company in Asia to establish an umbilical cord mesenchymal stem cell bank, and has been cooperating with more than 30 medical centers around the world with a number of cells.

LiveStrong Optoelectronics

specializes in high-end biomedical testing equipment/ technology, such as photocatalytic method for drug modification, Raman spectroscopy for bacteria count analysis, and pesticide testing that can analyze illegal additives, pesticides and so on that are added in food, helping the public to check the food safety.

KriSan Biotech Co., Ltd.

specializes in CDMO services for small molecules, nucleic acid, peptides, and ADC drugs, providing world-class professional services that can meet customers' needs from R&D, production, analysis to compliance shipments.

Charsire Biotechnology Corp.

has developed new drugs for dementia, and the products have won many awards, including the finalist award of Pharmaceutical Technology Research Award of DOH and the National Innovation Award.

Ducolege Biotechnology Co., Ltd.

specializes in extracting collagen with high biomedical activity from fish skin for wound medicine. The extraction technology retains the active ingredients of fish skin collagen, maintains high biocompatibility, degradability and low antigenicity, enhancing the moisturizing effect and helping the repair of injured tissues.

BIOTANICO, INC.

upholds the concept of developing natural, herbal, health-preserving, healthy, and pure health food. The products have passed a number of international certifications, allowing the Chinese Herbal Medicine technology in Taiwan to flourish.

Taiwan Jellyfig Biotech Co., Ltd.

specializes in the R&D and manufacturing of raw materials and solved the problems of being insoluble and low in bioavailability for health products. The health food is incorporated with the exclusive technology, enabling the drugs to be quickly absorbed by human body.

G&E Herbal Biotechnology Co., Ltd.

develops innovative drugs for cancer, the liver and the kidney. Its Hepanamin Capsules have broken through the bottleneck of the low absorption rate of the liver-protecting material “silymarin”, and the absorption rate can reach as high as 98.3%, surpassing the qualified standard of 75% dissolution rate stipulated by the World Pharmacopoeia and the 78.3% of the current active ingredient dissolution rate of the international well-known pharmaceutical factories.

2. 2022 SEMOCON Taiwan

Taiwan’s semiconductor industry plays a pivotal role in the world. To promote the semiconductor industry in southern Taiwan and to assist park manufacturers to step into the international market and enter the blue ocean for greater business opportunities, STSPB joined hands with 8 manufacturers to participate in the 2022 SEMICON Taiwan held on September 14-16 and created the STSP Image Pavilion. The participating manufacturers included Chung Yo Materials Co., Ltd., Taiwan’s first metal powder manufacturer for 3D printing; LiveStrong Optoelectronics that worked with Taiwan Space Agency in the development of satellite-related key components and technologies; PentaPro Materials Inc., manufacturer of the organometallic and specialty chemicals used for ALD and CVD process in semiconductor; AMETEK Taiwan Corp., LTD. that designs and manufactures precision measuring instruments and optical systems; Huang Liang Precision Enterprise Co., LTD. that specializes in CNC metal precision parts; APOGEE Optocom Co., Ltd. that specializes in the manufacturing of precision optical components and provided OEM services for semiconductor coatings; Coalition Technology Co., Ltd., the first professional manufacturer of precision ceramics and biomedical ceramics in Taiwan that crosses semiconductor and biomedical industries, combining technologies of Taiwan, Germany, and Japan; and ThinTech Materials Technology Co., Ltd., a manufacturer of optoelectronic materials. It is expected to create the momentum of the science park and spread the existing mature industrial cluster effect for the layout of emerging technology industries.

Group photo of the Director-General of the STSPB, Chen-Kang Su and the participating 8 manufacturers

3. MEDICA 2022

As the COVID-19 epidemic was gradually under control and countries around the world restarted overseas physical trading activities, STSPB helped park manufacturers seize opportunities and led them to participate in one of the largest medical technology trade fairs in the world, the MEDICA 2022 held on November 14-17 in Düsseldorf, Germany.

To work in line with the Six Core Strategic Industries Promotion Project and the Five Plus Two Industrial Innovation Plans, the linkages between the industry, government, academia, research, and medical sectors is enhanced to form a complete industrial cluster of precision health industry. In the post-epidemic era, the STSPB assists park manufacturers to go deep into the international medical materials market and showcase Taiwan's high-quality biomedical products. Five manufacturers, including EPED Inc., TAICEND Technology Co., Ltd., ACRO Biomedical Co., Ltd., KT Medical Inc., and HUANG LIANG Biomedical Technology Co., Ltd. formed a strong team of biomedical manufacturers to showcase the latest high-quality products and R&D technologies such as the precision health medical equipment, wound care, medical aesthetics or orthopedics. By participating in the international fairs and exhibitions, overseas business opportunities in medical and health care business can be seized for the park manufacturers to strive for more cooperation opportunities. This will help the industrial cluster of the biomedical industry at STSP thrive and grow.

Acting CEO of Metal Industries Research and Development Center, chairman and vice president of TAICEND Technology Co., Ltd., Deputy Director-General of STSPB, and the Deputy Division Chief of the Investment Division took a group photo at MEDICA

EPED Inc. demonstrates the surgical guidance system

Advanced Planning

STSPB has been dedicated to the promotion of the internationalization process of STSP, and an important part is to participate in international exhibitions and fairs. By participating in the fairs and exhibitions, park manufacturers can have exchanges and communication with international enterprises and institutions, grasp the latest industrial trends and technological development, and increase their exposure. This is the most important channel to open up international markets. Therefore, STSPB actively helps the park manufacturers participate in various international exhibitions, and continues to communicate with these manufacturers to know their needs and opinions so as to provide more effective support and services. With the continuous efforts in leading the park manufacturers to participate in international exhibitions and fairs, Southern Taiwan Science Park and the manufacturers will further flourish.

Vision：Stabilizing STSP Resources for Sustainable Operations

We constantly review the opportunities of expansion or establishment of a new science park to ensure the supply of industrial land. In the meantime, the STSPB has added new tap water resources, introduced recycled water and gradually complete power supply strategies for the short term and long term. This will ensure stable water and power supply, so as to attract the presence of high-tech industries, create economic value and job opportunities, and to achieve the vision of sustainable operations at the STSP.

Specific corres-ponding goals	Target 6.3 Improve the living hygiene of citizens by optimizing river water quality; enhance the implementation of sewage and wastewater treatment; enhance water reusability and reduce the demand for tradition resources development through the innovative use of secondary effluents from public sewage treatment plants; tighten the audit and control of industrial wastewater discharge and track down suspicious pollution sources to stop water quality pollution; optimize river water quality to protect the national health and maintain the ecosystem; and strengthen the chemical flow tracking to improve management performance.
	Target 6.4 Promote water conservation and enhance water efficiency to reduce substantial increase in average water consumption; encourage the water recycling rate of industrial park enterprises; enhance the process water recycling rate of science park enterprises; and ensure no substantial annual increase in freshwater withdrawals by enhancing water conservation and diversifying water sources, such as water reclamation and seawater desalination.
	Target 6.e Enhance recycling of industrial waste for proper waste disposal; implement total quantity control in science parks to guide park enterprises to reduce waste production and enhance waste recycling.
	Target 7.2 Increase the installed capacity of renewable energy.
	Target 12.4 Reduce waste production with green production, enhance the technical capabilities for the recycling and disposal of waste, promote high-efficiency development of the resources recycling industry, and achieve the management of chemicals and all wastes in accordance with agreed international frameworks.

Core Goals 6 and 12

Goal 6 Ensure environ-mental quality and sustainable management of environmental resources

Goal 12 Ensure sustainable consumption and production patterns

Specific corresponding goals	Self-defined tracking indicators	Authority
Target 6.3 Improve the living hygiene of citizens by optimizing river water quality; enhance the implementation of sewage and wastewater treatment; enhance water reusability and reduce the demand for tradition resources development through the innovative use of secondary effluents from public sewage treatment plants; tighten the audit and control of industrial waste-water discharge and track down suspi-cious pollution sources to stop water quality pollution; optimize river water quality to protect the national health and maintain the ecosystem; and strengthen the chemical flow tracking to improve management performance.	Implement the management of permits for cap control application, and the sewage from the park factories is 100% collected by the sewer pipeline.	Environmental Protection Section
	The discharged effluent from the sewage treatment plant was 100% in line with the Effluent Standards, and the water quality of the surface water body is inspected on a regular basis.	
Target 6.4 Promote water conservation and enhance water efficiency to reduce substantial increase in average water consumption; encourage the water recycling rate of industrial park enterprises; enhance the process water recycling rate of science park enterprises; and ensure no substantial annual increase in freshwater withdrawals by enhancing water conservation and diversifying water sources, such as water reclamation and seawater desalination.	Continue to implement coun-seling of water conservation for park manufacturers, and the recovery rate of all manufac-turers in the park is aimed to reach more than 80% in 2031.	Water, Electrical & Traffic Section
	In 2022, the park used or exchanged industrial reclaimed water of 8,000 tons/day, and the amount will reach 28,000 tons/ day by the end of 2023.	
Target 6.e Enhance recycling of industrial waste for proper waste disposal; implement total quantity control in science parks to guide park enterprises to reduce waste production and enhance waste recycling. Target 12.4 Reduce waste production with green production, enhance the technical capabilities for the recycling and disposal of waste, promote high-efficiency development of the resources recycling industry, and achieve the management of chemicals and all wastes in accordance with agreed international frameworks.	Implement the waste permit for cap control application, and the reuse rate of Resource Recycling Center maintains at more than 90%* (higher than the indicator 6.e.3 and 12.4.3).	Environmental Protection Section

Challenges/opportunities faced

The development of each park must comply with the content of the Environmental Impact Assessment (EIA) documents, review conclusions and commitments. STSPB requires enterprises to submit an estimate of the total amount of pollution before entering the park in the form of cap control and permit review so as to grasp the impact of the investment behavior on the overall park in advance. Besides, through the on-site inspection and tracking, STSPB further requires manufacturers to conduct self-management of the pollution control and prevention equipment, operating procedures and environmental protection work, as well as regular environmental monitoring, striving to reduce the environmental impact to the minimum.

With the development to industrial clusters, the overall water demand in the science park is also increasing every year. STSPB makes active management of the water consumption in the park in accordance with the Guidance and Control Measures for Water and Electricity in Science Parks of National Science and Technology Council to ensure the compliance with the cap approved by the EIA. In addition, measures for water source development, scheduling, counseling of water conservation and drought response are also carried out, striving to improve the overall water use efficiency and strengthen the stability of the water supply system in the park.

Specific actions and promotion highlights

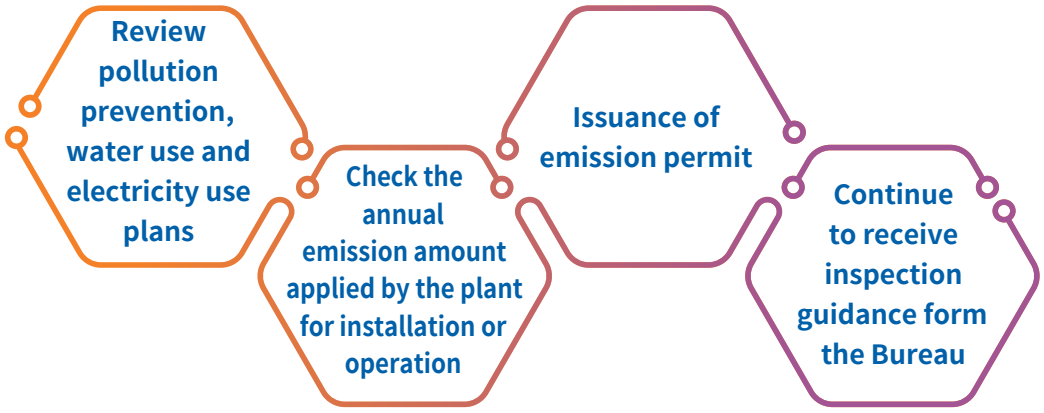
+ Implement environmental reviews and 100% of wastewater and sewage is included in sewage pipeline

Other core goals involved

Implementation content and promotion results

1. Environmental Review

STSPB plays the role of a keeper to maintain the sustainable environment of the science park. In addition to knowing whether all business units actually fulfill the content of the permit, the Bureau also needs to conduct on-site inspections and follow-up the improvement so as to further review the blind spots of the system. By regulating all business units to operate in accordance with the content of the permit through feasible methods, the Bureau can thus implement the management of permits and promotion of the cap control of various types of pollution to promote favorable environmental quality and sustainability.



Environmental permits in 2022

Review of 404	
119 permits for fixed pollution source	162 permits for waste
119 water pollution permits	4 permits for waste recycling
Note: Relevant service information and qualification for application are all available on STSPB's official website to provide open and transparent service information.	

To accurately grasp the environmental impact the pollutants cause during the construction period, STSPB has actively worked on the environmental impact assessment commitments and improvement of the review conclusions and continued to entrust professionals to handle the "Environmental Monitoring Plan During Construction Period at STSP", focusing on the investigations and tracking of the surrounding environmental quality of the park area under construction, so as to grasp the level of impact every project has on the quality of the environment, make timely adjustment of the construction method and take effective preventive measures to achieve the goal of taking care of the construction and maintaining the environment quality at the same time. Meanwhile, through the collection and analysis of the background data of the environment, a long-term environmental monitoring system and database can be established to meet the requirements of environmental tracking control.

In addition, the review of Management Regulations for Air Pollution Control Facilities and review of runoff wastewater pollution reduction plan at construction sites for construction projects in Tainan and Kaohsiung Science Parks were made. Regarding the environmental protection facilities in the science park, in addition to random inspection and monitoring by dispatched personnel, environmental protection authorities such as the EPA, the Environmental Protection Bureau of Tainan City and Kaohsiung City would also carry out inspections from time to time since the sewage treatment volume and waste disposal volume both reach a certain scale.

Before the construction project began

Start counseling
- Owner
- Contractors

After the construction project began

Daily inspection of the park
- On-site runoff water monitoring
- Business noise monitoring

Monthly

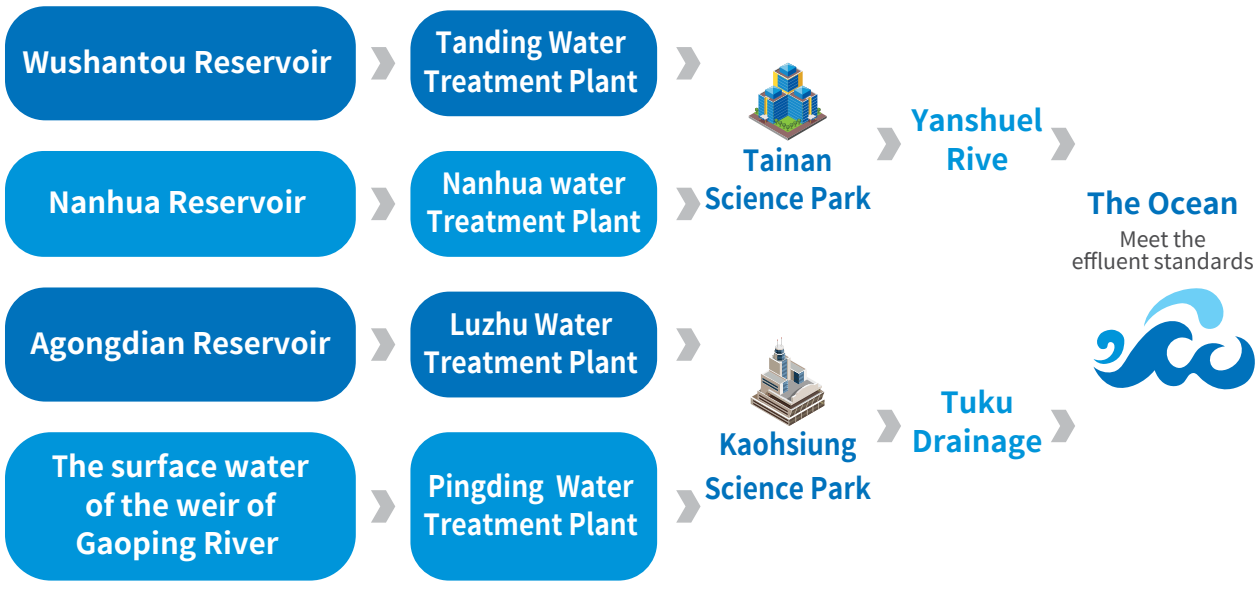
Review of Management Regulations for Air Pollution Control Facilities in construction projects

Yearly

Review of runoff wastewater pollution reduction plan at construction sites for construction projects

2. Wastewater Treatment

Sewage discharged from the factories in the park is collected by the sewer pipeline, and the acceptance rate reaches 100%. In 2021, all the wastewater generated in the whole science park was properly treated and met the influent standards of the science park before being discharged into the sewage system. After treatment, the quality of all discharged water meets the effluent standards and the discharged water eventually flow to the sea. Part of the discharged water is recycled for equipment cleaning, plant watering and landscape ponds.



2022 Overview of wastewater treatment at STSP

Unit: million liters

Item	Tainan Science Park Sewage Treatment Plant	Kaohsiung Science Park Sewage Treatment Plant	Sum
Amount of tap water	78.47	2.31	80.78
Amount of influents	52,660.51	3,493.08	56,153.59
Amount of effluents	57,722.61	3,272.73	60,995.34
Amount of water recovery	1,740.19	87.90	1,828.09
Total dissolved solids average monitoring value (mg/L)	3,770	3,199	-

Note:

1. The amount of influents is the industrial wastewater discharged by park businesses to Wastewater treatment plant in Tainan Science Park and Wastewater treatment plant in Kaohsiung Science Park.
2. The amount of effluents is the effluents discharged from Wastewater treatment plant in Tainan Science Park and Wastewater treatment plant in Kaohsiung Science Park to the ocean.

Overview of water recovery at STSP from 2020 to 2022

Item		2020	2021	2022
Recycling rate of wastewater	Tainan Science Park Sewage Treatment Plant	0.68%	1.20%	3.30%
	Kaohsiung Science Park Sewage Treatment Plant	1.83%	1.94%	2.52%
Usage rate of recycled water	Tainan Science Park Sewage Treatment Plant	78.48%	87.11%	95.69%
	Kaohsiung Science Park Sewage Treatment Plant	96.42%	96.06%	97.44%

Note:

1. Wastewater recycling rate= recovered water/influents.
2. Usage rate of reclaimed water= reclaimed water usage/ (reclaimed water usage+ tap water usage).
3. Spring rain was relative less in 2021, and the orange drought alert (reduced water supply) was issued, so recycled water was used for suppressing dust on the ground of Tainan Science Park Sewage Treatment Plant.

Tainan Science Park Sewage Treatment Plant

Since the operation of Tainan Sewage Treatment Plant, it has undergone several expansion projects in response to the increase of the volume of wastewater in the park. Currently, its permitted capacity of sewage treatment has reached 243,000 tons per day. Sewage is treated through Secondary (Biological) Process and trinary filtration and the treatment of the sludge adopts mechanical thickening and dewatering. The amount of waste sludge in 2022 was 15,759 tons, which was handed over to the Resource Recycling Center for incineration treatment and to qualified treatment companies for heat treating. At the same time, to ensure the water quality of the park, a water quality inspection room has been established, and the testing and evaluation of the testing capabilities of the inspection room is implemented through an impartial and independent third party.

In response to the increase of sewage volume from the factory expansion projects of park manufacturers and the quality control of ammonia nitrogen in the discharged water, Tainan Sewage Treatment Plant is currently working on the Phase II 3-stage AO+MBR project with the daily treatment capacity of 65,000 CMD. The first stage is expected to be completed in April, 2022, and the second stage in December in the same year.

Kaohsiung Science Park Sewage Treatment Plant

Kaohsiung Sewage Treatment Plant is located in the east side of the science park, with an area of 7.79 hectares. The designed water treatment capacity in Phase I is 45,000 tons, and the current permitted sewage treatment capacity is 16,500 tons daily. Sewage is treated through Secondary (Biological) Process and trinary filtration and the treatment of the sludge adopts mechanical thickening and dewatering. The amount of waste sludge in 2022 was 907.38 tons, which was handed over to the Resource Recycling Center for incineration treatment and to qualified treatment companies for final treatment. There is an EPA certified lab in the plant, and the water quality of each unit in the factory and from the manufacturers is regularly analyzed. In addition, A/O treatment system has also been added for ammonia nitrogen treatment to reduce the discharge of nitrogenous substances, reducing the load of the sewage treatment system and environmental impact.

3. Monitoring of the Environment

The major monitoring items in the science park all met the legal requirements. Detailed indicators and data of monitoring are regularly disclosed on the official website of the STSPB. Please go to the “Environmental Monitoring Data” section for details. In 2022, STSPB received 1 complaint of pipe with white smoke, which was investigated and handled immediately.

Environmental monitoring data query

Monitoring item	Tainan Science Park	Kaohsiung Science Park
Monitoring of air quality	✓	✓
Monitoring of environmental noise	✓	✓
Monitoring of environmental vibration	✓	✓
Monitoring of surface water quality	✓	✓
Monitoring of traffic	✓	✓
Monitoring of the Resource Recycling Center	✓	There is no Resource Recycling Center.
Monitoring of water quality of effluents in the wastewater treatment plant	✓	✓
Monitoring of groundwater quality	✓	✓

In accordance with Air Pollution Control Act, in addition to GHG, STSPB also takes regular inventories of various air pollutants, including nitrogen oxides, sulfur oxides, volatile organic compounds and particulate matters to reduce environmental burden.

Unit: tons

Item	Tainan Science Park	Kaohsiung Science Park
Nitrogen oxides (NOx)	447.9	53.9
Sulfur oxides (SOx)	104.1	10.4
Volatile organic compounds (VOCs)	936.8	230.0
Particulate matters (Par)	54.3	7.8

Note: The figures in the table were the permitted emissions of pollutants in Tainan and Kaohsiung Science Parks as of the end of 2021 (tons/year).

The increase in concentration of GHG has caused more and more significant global warming effects. The result of global warming not only affects the biological ecology but also damages economic activities of humans greatly. The ozone layer that is very important to living creatures on earth is also destroyed because of this. The Bureau understands the seriousness of it and is devoted to environmental protection. No ozone-depleting substances are used in the Bureau, and no harmful gases that have significant impact on the environment and the ozone layer were emitted in 2022.

+ Reduce water intensity in the park and improve stability of water supply

Other core goals involved

Implementation content and promotion results

1. Stabilize water supply

In 2022, the rainfall in the south was less than 40% of the historical average, hitting a new record law in 30 years. STSP worked in line with the Water Resource Agency and relevant units in advance and started various water-saving and scheduling measures from August, 2022, and continued to promote measures of developing new water sources, reducing water use, scheduling, and backup to mitigate the impact of drought. From December 2, the yellow light for water supply (decompression water supply) was issued for Tainan region, and the light turned orange (reduced water supply) from March 1, 2023. In Kaohsiung region, the orange light for water supply (reduced water supply) started from March 30, 2023. The water supply situation in the southern regions was getting tighter. In response to changes in water conditions, STSPB has adopted the following drought-resistance measures in the face of severe water conditions to stabilize the water demand for the industrial operations in the park.

1. Cross-departmental cooperation for the review of the water supply condition on a rolling basis: We actively cooperate with the Central Drought Emergency Response Center and flexibly review the countermeasures with the Water Resources Agency, Taiwan Water Corporation and other agencies to reduce the impact of water shortage.

2. Set up an emergency response team, strengthen communication of water conditions, and strictly control the goals for water conservation: An emergency response team is set up and manufacturers as well as relevant units are invited to understand the water conditions at each stage, discuss the countermeasures, and promote water conservation among manufacturers. We work with the policies of Water Resources Agency for water rationing measures at each stage and implement a cap control. Water meter reading data of park manufacturers are collected weekly, and large water users are regularly invited to review water saving situations, aiming at controlling the water saving effects to reach the goal of water conservation.

3 Strengthen guidance and inspection: For the inspection of self-reported water saving effects from large water users, the water saving effects will be discussed through meetings, mails, phone follow-ups and on-site visits and counseling to reach the goal of water conservation.

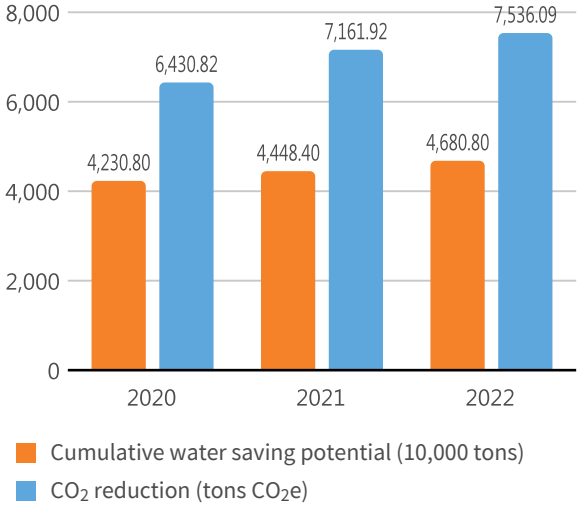
4 Coordination for responses among park manufacturers

1. Reduce water consumption of tap water in the factory area and suspend the supply for unnecessary water use.
2. Improve the reuse rate of recycled water during the process
3. Add or prepare the water-saving equipment in the production line in the factory area.
4. Open water intake from detention ponds and sewage plants for secondary water use.
5. Activate the water wheel mechanism in a timely manner to stabilize industrial operation and public water demand.

Counseling of water conservation

To reduce the water consumption in the science park to solve the urgent water problems to meet the EIA requirements and to cooperate with the promotion of energy conservation and carbon reduction policies, the Bureau has actively engaged in the counseling of water saving and energy conservation and strengthened the advocacy to encourage park manufacturers to build green factories.

We handled water conservation counseling for 6 park business units in 2022 and have completed counseling for 124 park business units so far since the implementation of the counseling service. In terms of the actual results of the water conservation measures, the water saved was approximately 4,680.80 million tons/year, equivalent to the reduction of 7,536.09 tons of carbon dioxide emissions in a year.



Visit to Epistar Corporation

Note: According to the announcement of Taiwan Water Corporation (TWC) in 2022, approximately 0.161kg of CO_2e emission can be reduced for every ton of tap water saved.

Develop reclaimed water sources

In the face of the challenge brought by extreme climate, the gap between the rainfall and drought has widened, and the water environment in southern Taiwan has also been challenged. Industrial water use is even an issue STSP has to be prepared to confront. The Bureau has actively guided park manufacturers to use reclaimed water. In 2022, STSP has become the very first science park to make use of reclaimed water. The reclaimed water resource strategy has two directions, the use of reclaimed water and the exchange of water sources, which are also promoted in newly established park areas. The development and utilization of water sources are moving toward diversification and sustainability.

Use of reclaimed water

To meet the water supply needs in Tainan Science Park, inter-ministerial and local government collaboration has been implemented since 2018 in the planning of a reclaimed water supply park from three sources, including Yongkang, Anping and the reclaimed water in the park area. In 2022, 8,000 CMD of reclaimed water from Yongkang was first drawn to the science park, making it the first reclaimed water plant in Taiwan that can supply process water for high-tech manufacturers. In April, 2023, the reclaimed water from Anping was officially drawn to STSP, making it the pioneer example of the city government to provide effluents to the science park.

Distributing reservoir and Advanced treatment facilities

In addition, STSPB announced to solicit manufacturers to invest in the construction of a reclaimed water plant in the Water 7 Land, and TSMC won the contract. To enable the cleanliness of reclaimed water to meet the requirements of the wafer manufacturing process, the complexity of wastewater treatment is more than 4 times that of a water treatment plant for general domestic water use. On September 19, 2022, the completion ceremony of the TSMC S.T.S.P. (Southern Taiwan Science Park) Reclaimed Water Plant was organized, which is the first water source in Taiwan to reuse the reclaimed water from semiconductor process water source.

In response to the poor water conditions in Tainan in 1H23, STSPB once again coordinated the cross-ministerial and local government collaboration to increase the supply of reclaimed water from Yongkang to 9,200 CMD, to 20,000 CMD for the reclaimed water from the science park, and to 20,000 CMD from Anping Reclaimed Water Plant, reaching 49,200 CMD in total, accounting for nearly 1/4 of the overall tap water consumption in Tainan Science Park. This further enhanced the water supply resilience during the drought-resistant period, enabling the water resources in the southern regions to be shared, with more scheduling flexibility and providing more secure water supply.

Water exchange

The construction of Rende Water Recycling Plant started on November 16, 2022, creating the first case of reclaimed water exchange in Tainan. The manufacturers near the reclaimed water plant exchange the original tap water to be used with the reclaimed water for use, and the park manufacturers pay the difference subsidy, greatly saving a lot of pipeline construction and operating expenses. It is expected to provide 8,000 CMD daily after completion in 2024, achieving the supply model of emerging water sources among four parties (the City Government, the one whose water is exchanged, the one exchanges water, and the science park) and at the same time satisfying the water demand. This model is planned to be expended to the newly established science park areas so as to reach the synergy of flexible utilization of water sources.

Groundbreaking ceremony of the Rende Water Recycling Plant

Water supply schedule for reclaimed water plants at STSP

Category	Water supply (CMD)	Estimated water supply schedule
Yongkang	First phase: 8,000	-
	Second phase: 15,500	May, 2025
Anping	First phase: 10,000	-
	Second phase: 37,500	April, 2025
Rende (water exchange)	10,000 (Chimei: 6,000)	June, 2024
Science Park	First phase: 5,000	-
	Second phase: 20,000	December, 2023
	Third phase: 30,000	2026

In the face of unstable water sources under the influence of extreme climates, STSP has obtained support and assistance from multiple partners to obtain water for industrial use in the park area. It is estimated that the use of reclaimed water in Tainan Science Park will reach 93,000 CMD, accounting for 30% of the overall water consumption in Tainan Science Park, reducing the pressure of traditional water source development. To respond to the development needs of new science parks, STSP continues to cooperate with competent authorities of water sources,

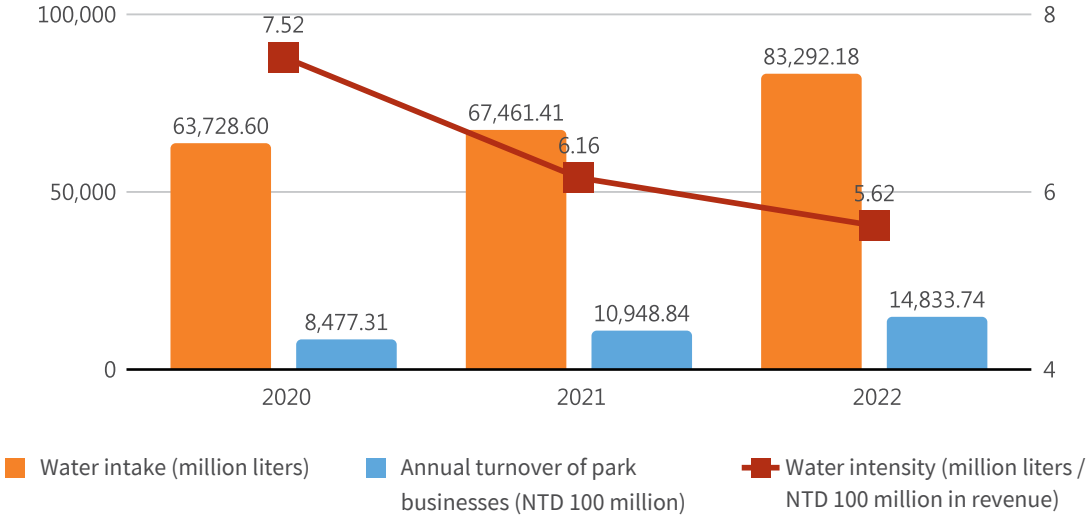
the Construction and Planning Agency, and county and city governments in the promotion of reclaimed water use, exchange, and diverse scheduling of water use so as to increase the resilience of water resources scheduling, reduce the dependence on tap water, create co-prosperity between the industry and the environment, and eventually reach the goal of a sustainable science park.

2. Water Consumption of park manufacturers

The main water intake in the science park comes from tap water. Enterprises' intake and consumption of water as well as the quality of discharged water may cause impacts on the ecosystem. Therefore, the Bureau assists park businesses to understand their overall water use status. Based on the Water Risk Atlas of the World Resources Institute, it shows that Tainan Science Park and Kaohsiung Science Park belong to Low - Medium (1-2), indicating that the water intake of park businesses does not cause a major impact on the ecological environment. Due to the plant expansion of the park manufacturers in 2022, the water intake increased. But because of the significant growth of annual turnover of the park business which exceeded NTD 1 trillion, the water intensity decreased by 8.87% compared with 2021.

Item	2020	2021	2022
Water intake (million liters)	63,728.60	67,461.41	83,292.18
Water discharge (million liters)	45,852.19	48,891.68	60,995.34
Water consumption (million liters)	17,876.41	18,569.73	22,296.84
Annual turnover of park businesses (NTD 100 million)	8,477.31	10,948.84	14,833.74
Water intensity (million liters /NTD 100 million in revenue)	7.52	6.16	5.62

Note: Water consumption = water intake – water discharge



3. Water Consumption of STSPB

We understand the importance of water resources, and STSPB starts cherishing water by setting an example of promoting water conservation measures to improve the water consumption efficiency in all units and strengthen water management and water recovery to achieve the purpose of sustainable usage of water resources. Due to the very little rainfall in the second half of 2022, it was impossible to collect rainwater to turn it into reclaimed water for flushing toilets. In addition, the weather was dry, so the water consumption of the air-conditioning and cooling system increased, leading to increased water consumption in 2022 compared with the previous year. The Bureau continued to strengthen water management and replaced all the water-using equipment with water-saving types, and the installation rate of water saving devices reached 100% to achieve sustainable use of water resources.

Item	2020	2021	2022
Water consumption (million liters)	10.57	10.61	10.743
Floor area (m^2)	42,565.70	54407.70	54407.70
Water intensity (million liters/ m^2)	0.000248	0.000195	0.000197

Note:

1. Water intensity is calculated with the floor area of the administration building of the Bureau serving as the denominator.
2. Starting from 2021, the water consumption data reported to STSPB of Energy will include the customer number of Kaohsiung Administration Building so that comparison between the two administration buildings at STSP can be made when the statistics are complete to facilitate the promotion of water conservation measures.

+ Proper Treatment of Waste

Other core goals involved

Implementation content and promotion results

As the park businesses develop, the industrial waste in the science park also increases year by year. STSPB actively provides counseling to park businesses to implement source separation and recycling to reach the goal of resource recovery, waste reduction and no secondary pollution. The 2022 reuse volume of the industrial waste in the science park reached 504,033.50 tons, with the reuse rate of 93.19%.

Item / Science Park	2022		
	Production volume (tons)	Reuse volume (tons)	Reuse rate (%)
Tainan	526,895.10	493,079.73	93.58
Kaohsiung	13,943.41	10,953.77	78.56
The whole park	540,838.51	504,033.50	93.19

In addition, to cope with the diverse types and characteristics of waste produced in diverse industries in Tainan Science Park, the Bureau has established a well-equipped Resource Recycling Center with waste removal equipment and treatment facilities to properly remove and dispose waste in the park. The process of waste transfer is entrusted to legal operators for removal, incineration, and a real-time tracking system (GPS) is installed on the removal and transportation equipment for management. In 2022, the Resource Recycling Center properly processed 26,300 tons of waste.

By promoting the third phase of construction of the landfill site of the Resource Recycling Center in Tainan Science Park, the Bureau not only maintains normal waste removal and normal operation of the treatment facilities (equipment) but also strengthens the capabilities of effective treatment of general inorganic waste produced in the science park and increases the total amount and a site (the designed landfill capacity is 90,000m^3, with 15 years of service life) for safe landfill (of bottom ash, fly ash, etc.) of general industrial waste classified and incinerated. By doing so, the future needs of the landfill volume and scheduling as well as use of landfill sites can be met for the Resource Recycling Center, and it also demonstrates the determination to implement environmental protection policies.

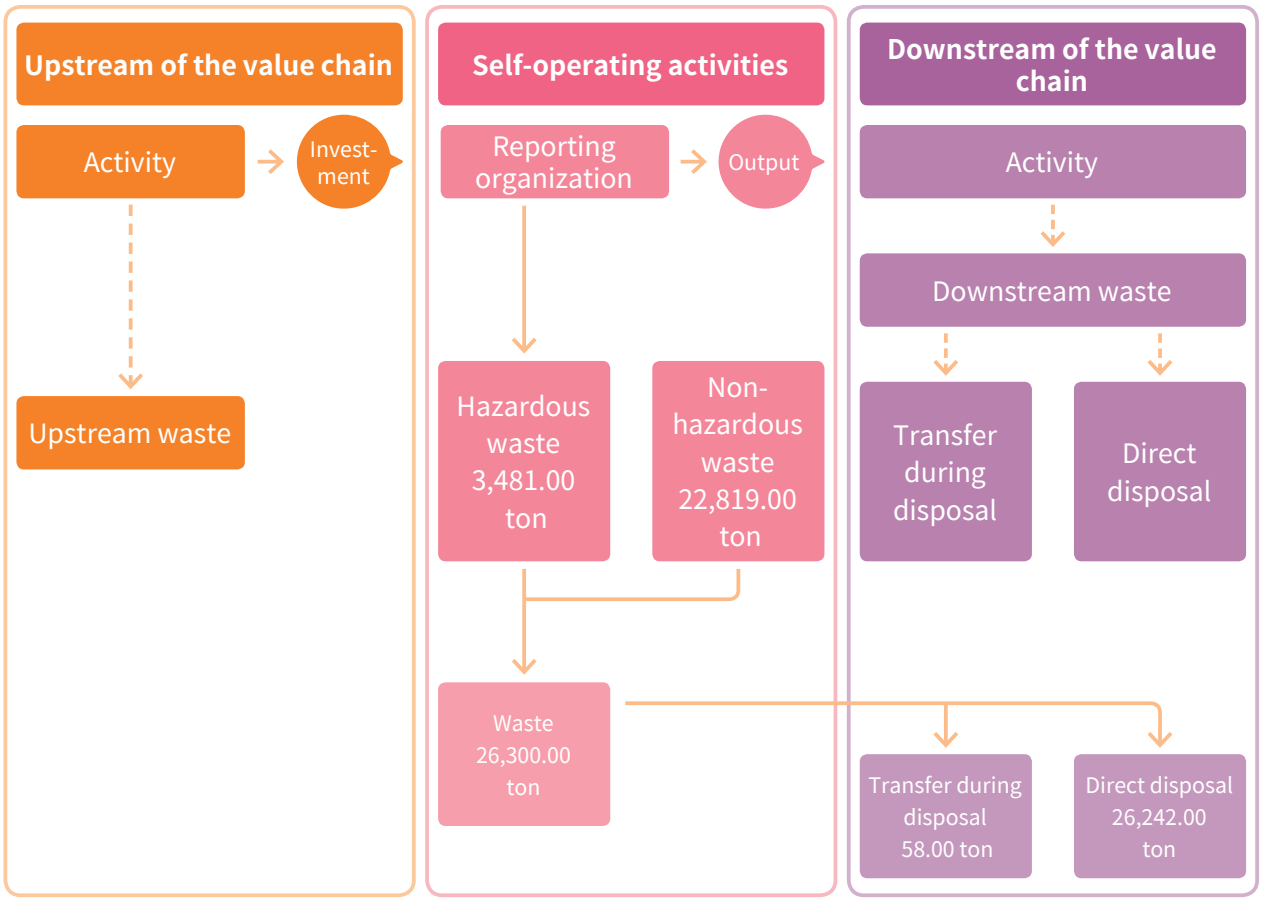
Unit: tons

Composition of waste		Hazardous waste		Non-hazardous waste		Remarks
Method of treatment		On-site	Off-site	On-site	Off-site	
Transfer during disposal	Other disposal operations	-	-	-	58	The Resource Recycling Center removes and transports the recyclables in the dorm area, and Sinshih Cleaning Squadron does the recycling and disposal
	Subtotal	-		58		

Composition of waste		Hazardous waste		Non-hazardous waste		Remarks
Method of treatment		On-site	Off-site	On-site	Off-site	
Direct disposal	Incineration (including energy recovery)	3,475	-	16,485	3,008	Off-site (transfer to large incineration plant during the annual overhaul period)
	Landfill		-	3,250	-	bottom ash, fly ash, etc.
	Other disposal operations	6	-	18	-	Physical/Chemical Treatment, solidification
	Subtotal	3,481		22,761		
Temporary stored in the plant		3,481		22,819		
Total amount of waste		26,300				

Note:

1. "On-site" refers to the area within the physical boundary or administrative control of the reporting organization; "off-site" refers to the area outside the physical boundary or administrative control of the reporting organization.
2. Part of the industrial waste in Tainan Science Park is transported to the treatment agencies by the park manufacturers themselves; all industrial waste in Kaohsiung Science Park is transported to the treatment agencies by the park manufacturers themselves.



Advanced Planning

To respond to the expansion of investment scale of the science park and manufacturers, STSPB continues to increase the treatment capacity of the sewage treatment plant and the Resource Recycling Center and grasp the environment quality within and around the science park through automatic continuous monitoring and manual batch monitoring. To reduce the negative impact of economic activities on the environment, we encourage park businesses to effectively recycle resources for reuse to promote circular economy. In terms of water resources, we assist park manufacturers to reduce water consumption for unit production through counseling on water conservation. At the same time, the reclaimed water sources are introduced to not only lower the burden on ground water sources but also improve the stability of water supply in the park. In addition to using the cap control as a means to control pollution, we will also pay attention to the advancement of recycling technology and adjust the management measures in accordance with laws and regulations to gradually step toward a sustainable green park.

Core Goals 7

Goal 7 Ensure access to affordable, reliable, sustainable and modern energy for all

Specific corresponding goals	Self-defined tracking indicators	Authority
Target 7.2 Increase the installed capacity of renewable energy.	Continue to increase the installed capacity of solar PV power equipment in the park. The capacity of the solar PV devices installed in the park is expected to reach 84 MW in 2023.	Water, Electrical & Traffic Section

Challenges/opportunities faced

The park area of STSP continues to expand, and the number of stationed manufacturers and energy demands increase simultaneously. In accordance with the Guidance and Control Measures for Water and Electricity in Science Parks of National Science and Technology Council, STSPB checks the statistics and controls the energy consumption status on a regular basis to ensure the compliance with the cap approved by EIA. To stabilize the energy use of the park businesses, the Bureau actively coordinates with Taiwan Power Company for the improvement

of the power supply equipment and strengthens the overall power network of the park. In addition, the Bureau also responds to the Green Roof Plan Policy of the central government and work with park manufacturers to promote solar power generation to not only increase the amount of self-sufficient power supply, but also contribute to environmental protection.

Specific actions and promotion highlights

+ Installation of Renewable Energy Systems to stabilize power supply in the park

Other core goals involved

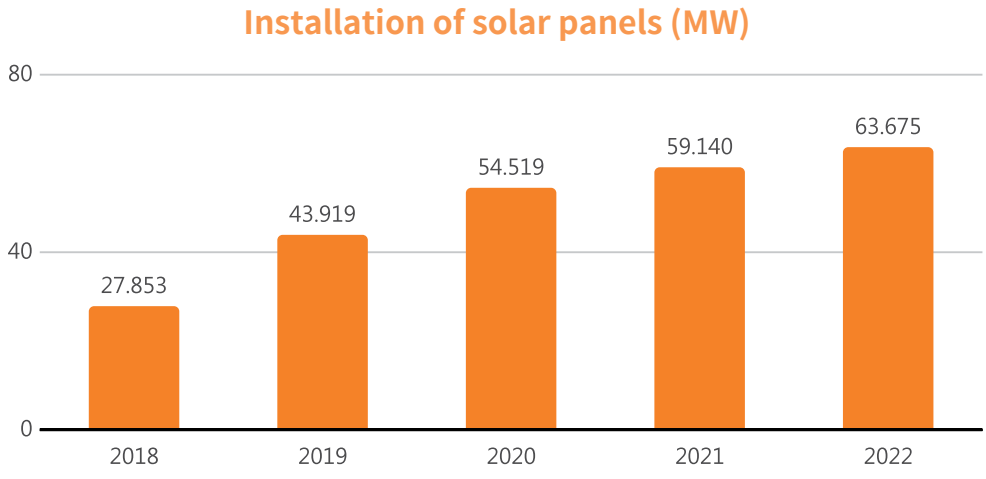
Implementation content and promotion results

1. Installation of roof-type renewable energy system

STSPB has actively installed solar panels in the science park (on the roofs of NNKIEH, Administration Building of the Bureau, Police Building, STSP Commercial Center, flood control pumping station, wastewater treatment plant, Resource Recycling Center, and standard factories in the science park). Statistics are in the table below. In 2022, the solar panels installed in the science park generate 4.29MW of electricity, with the cumulative power generation of 63.68 MW, reducing41,404 tonnes of CO_2e/year. The capacity of renewable power generation and carbon reduction increase year by year to achieve the effect of environmental protection.

Item	2018	2019	2020	2021	2022
Installation of solar panels (kW)	27.853	43.919	54.519	59.140	63.675
Annual power generation (10,000 kWh)	3,477	4,969	6,965	7,555	8,134
Reduction in carbon dioxide emissions (tons/year)	18,532	25,292	35,452	38,455	41,402

Note: The power coefficient for 2021 was calculated with 0.502 kg CO_2e/kWh (in accordance with the table of GHG emission coefficient management v. 6.0.4 released by Environmental Protection Administration in 2020



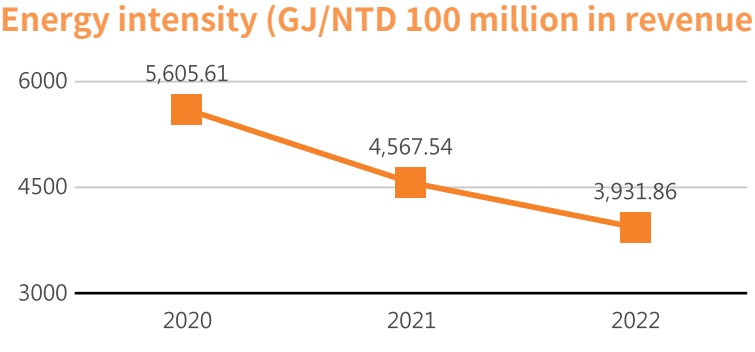
2. Strengthen the power network

STSPB continues to work closely with Taiwan Power Company. Currently, the expansion of the ultra-high voltage substation is ongoing to meet the overall power supply needs in the science park. In 2022, due to the expansion of factories, the power consumption increased, and the annual turnover of the park businesses also increased significantly, leading to the 14% drop in the power intensity compared with 2021, showing a downward trend in several consecutive years.

Item	2020	2021	2022
Electricity use (kWh)	13,200,148,196	13,891,455,793	16,201,180,704
Energy consumption (GJ)	47,520,533.51	50,009,240.85	58,324,250.53
Annual turnover of park businesses (NTD 100 million)	8,477.31	10,948.84	14,833.74
Energy intensity (GJ/NTD 100 million in revenue)	5,605.61	4,567.54	3,931.86

Note:

1. Every 1 kilowatt-hour of electricity=1kWh=3,600 kilojoules.
2. The energy intensity was calculated with the total turnover of the STSP businesses for the current year as the denominator.
3. The source of electricity in STSP is from Taiwan Power Company.



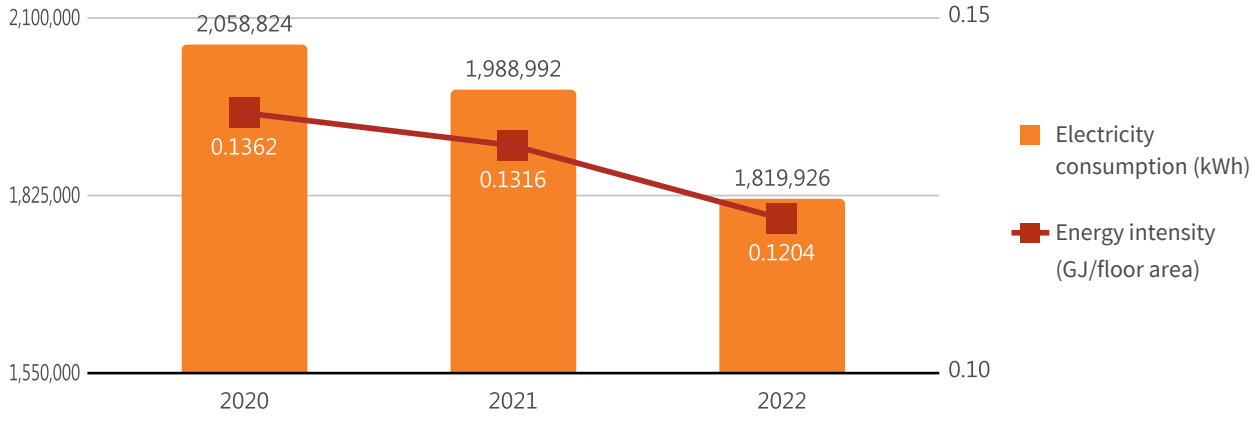
When a power incident (such as voltage drop and power outage) that affects the power supply for park manufacturers, the Bureau will immediately coordinate with Taiwan Power Company to find out the cause and restore it as soon as possible. In addition, through the mechanism to understand the impacted status of the park manufacturers and the power quality improvement meetings convened by the Bureau with park association, Taiwan Power Company and park manufacturers, the cause of the incident will be discussed for improvement measures to reduce the impact of power supply incidents.

3. Electricity Consumption of the Bureau

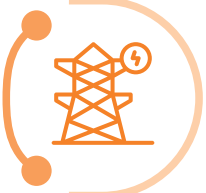
Through active response to and promotion of energy saving and carbon reduction policies, the Bureau effectively implements sustainable management through joint efforts through education and has integrated green management into daily operation.The target of electricity consumption management at STSPB is to consume less electricity compare with the previous year. As the epidemic situation eased, the control of crowd flow in public areas were gradually opened up, and the number of people coming the Bureau for business or meetings also increased, leading to the increased electricity consumption. The electricity consumption in 2022 increased by 0.96% compared with 2021. The Bureau still has to strengthen power management and implementation of energy conservation measures.

Item	2020	2021	2022
Electricity consumption (kWh)	1,968,037	1,807,396	1,824,764
Solar power consumption (kWh)	20,955	12,530	8,990.06
Energy consumption (GJ)	7,160.37	6,551.73	6,601.51
Floor area of STSPB (m^2)	54,407.25	54,407.25	54,407.25
Energy intensity (GJ/floor area)	0.1316	0.1204	0.1213
GHG emission intensity (ton CO_2e/floor area)	0.0184	0.0170	0.0172

Note:
1. Every 1 kilowatt-hour of electricity= 1kWh= 3,600 joules.
2. The GHG emission intensity of the Bureau was calculated based on the EPA's Greenhouse Gas Emission Coefficient Management Table 6.0.4 version.
3. The source of electricity at STSPB is from Taiwan Power Company and solar power.



After years of the Bureau's restless efforts in energy conservation and carbon reduction, the effectiveness of energy conservation achieved continues to accumulate. We spare no efforts to protect the environment, continue to ask our staff to abide by the energy and water saving measures and plan long-term and feasible measures. While operating the science park, the Bureau also strengthens counseling and inspections of air, wastewater discharge and waste disposal of the park manufacturers to ensure the compliance with environmental laws and regulations, aiming at stepping toward a low-carbon science park.



1. Make ice during the off-peak hours for the ice storage air conditioning system.
2. Promote the energy and electricity saving concept and adjust the air-conditioning supply time.
3. Make regular patrols and turn off power when not used at hand.
4. Encourage the staff to take the stairs, and the elevator is set to skip the 2nd floor of the administration building.
5. Make use of card insertion device for energy conservation to ensure complete cut of power.
6. Automatic lighting system is installed in some areas, and the air conditioners are all installed with variable-frequency device.

Advanced Planning

The initial planning of STSP did not include an independent power system but shared the power grid with Tainan City. Therefore, when the industrial cluster were established, the surrounding population and manufacturers also increased, causing the overload of the power supply system. STSPB kept communicating and coordinating with Taiwan Power Company, and an ultra-high voltage substation and two power distribution/substations have been established in the park to improve the quality of power supply in the science park. In addition, we also work with the trade associations to carry out the diagnosis and improvement projects for the power transmission equipment, striving to provide stable and reliable power for the science park.

In terms of the renewable energy, STSPB has successively installed solar power generation equipment on the roofs of public buildings and encouraged park manufacturers to install their own solar power equipment. The space allowing the installation of such equipment is indeed limited, and therefore, the total power generation of renewable energy does not contribute much to the overall power consumption in the science park. Despite this, the Bureau still continues to cooperate with the terms for large power users and encourages park manufacturers to expand the installation scale of the self-use power generation equipment.

Vision：A Sustainable Environment for Industry, Living, Life, and Ecology

To safeguard the lives of relief workers, the STSPB will develop indoor positioning, telecommunication, and VR/AR technical applications to integrate disaster relief fields into its science parks. Environmental policies including water and energy conservation, green energy, and big tree re-plantation will be continuously implemented to reduce the impact of production and development on the ecological environment. Public art will be promoted through cooperation with local cultural and public education groups to connect the STSP with the public. The STSPB aims to build a high-quality industrial environment filled with cultural elements.

Specific corres-ponding goals	Target 11.2 Provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.
	Target 11.3 Promote inclusive, sustainable and full participatory cities and human settlement planning and management.
	Target 11.4 Strengthen efforts to protect Taiwan's cultural heritage, natural heritage and the human landscapes that contain the collective memories and historical tracks of people.
	Target 11.7 Provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities.
	Target 11.12 Enhance the efficiency of building energy conservation and carbon reduction.
	Target 13.1 Strengthen resilience and adaptive capacity to climate change and reduce vulnerability.
	Target 13.2 Implement the stage targets of GHG control.

Core Goal 11

Goal 11 Make cities and human settlements inclusive, safe, resilient and sustainable

Specific corresponding goals	Self-defined tracking indicators	Authority
Target 11.2 Provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.	Continue to operate e-shuttle buses in and the Demand Responsive Transit Service (DRTS) in STSP that operates at least 200 days a year.	Water, Electrical & Traffic Section
	Continue to operate the STSP Cloud Traffic Control Center and effectively maintain the time for handling accidents within 15 minutes	
Target 11.3 Promote inclusive, sustainable and full participatory cities and human settlement planning and management.	Hold at least 4 sessions of neighborly activities for local neighbors every year.	Labor Relations Section
Target 11.4 Strengthen efforts to protect Taiwan's cultural heritage, natural heritage and the human landscapes that contain the collective memories and historical tracks of people.	Organize at least 5 art and cultural exhibitions in the Hsing-Kuang Hsier Local Culture Hall every year.	Foreign Trade Section
	Continue to operate the Museum of Archaeology and organize at least 1 archaeology activity every year.	Land Planning and Construction Management Section
Target 11.7 Provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities.	Continue to maintain the quality of green space maintain the area of at least 20% of green space in the park.	Facility Maintenance Section
	Plan the landscape improvement projects in the existing park areas, and maintain at least 4% of the green space in newly-developed park areas.	Civil Engineering Section

Goal 11 Make cities and human settlements inclusive, safe, resilient and sustainable

Specific corresponding goals	Self-defined tracking indicators	Authority
Target 11.7 Provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities.	Maintain the artificial wetland in the since park and keep the area of 20 hectares for ecological protection area.	Land Planning and Construction Management Section、Environ-mental Protection Section
Target 11.12 Enhance the efficiency of building energy conservation and carbon reduction.	Maintain the existing Ecological Community Evaluation System (EEWH-EC) certification and encourage manufacturers to adopt green building design to facilitate the certification of the new science parks.	Architec-tural Section

Challenges/opportunities faced

STSP not only serves as the technology powerhouse in southern Taiwan, but also a community where People in STSP live. STSPB has adhered to the development visions of “innovation, inclusion and sustainability” and been dedicated to maintaining a tripartite balance among technological development, humanities and the arts, and the ecological environment. By preserving local cultural assets and actively participating in combined public welfare activities, good relations with the surrounding residents are maintained. In addition, service providers of various life functions are introduced to provide various park activities and functional equipment for food, clothing, housing, transportation, education, and entertainment, creating a living environment suitable for settlement and working.

With an aim of becoming a sustainable green park, the ecological protection area and the artificial wetland have been established, the second ecological protection area with legal basis in Taiwan. In addition to continuing the maintenance of the ecological environment, the biodiversity observation is also conducted. The positive influence of the ecological environment can be achieved through environmental education to spread the environmental awareness externally.

Specific actions and promotion highlights

+ Construction of a stable and convenient transportation system

Other core goals involved

Implementation content and promotion results

1. STSP E-shuttle bus

In addition to providing different lines of shuttle buses for commuting passengers and those taking to and from trips between TRA Nanke Station or HSR Tainan Station.

To better meet the users' demand, the STSP Shuttle Bus Green line (HSR Line) even combines the Demand Responsive Tranportation System (DRTS) to receive reservation one hour before departure and picks up passengers at the shuttle bus stops in all plants in addition to the fixed bus schedules and station rides.It is recommended to download the APP, Science Park Action Wizard 2.0, and click on STSP for the real-time information of the STSP shuttle bus and other related riding information.

To respond to the large number of employees for the development in the northwest side, the frequency of the existing timetable of the North Park Line (Purple Line) can no longer meet the needs of the public. To effectively improve this problem, the North-West Line and the North Park Line have been merged into the North Line (Orange Line). To meet the demands of the original North-West Line passengers, an additional Innolux P5 Stop has been added and the route of the original North-West Line is given priority to detour, so that the passengers of the original line will not be influenced.

The North Line has 19 runs around the park area every day, meeting the needs in the northwest side and also bringing convenience for the general public.

Android Science Park Action Wizard 2.0 Android

Science Park Action Wizard 2.0 ios

Timetable of STSP Shuttle Bus

In 2022, the average daily number of passengers was about 1,097, the daily milage of diesel vehicles was about 576.5 km/day, and that of the e-shuttle bus was about 740.6 km (the e-bus can averagely reduce the diesel consumption by about 185.16 liters every day (the milage of e-bus/1 liter of gasoline can run 4km), reducing approximately 482.53 kgCO_2e. The overall carbon reduction was 761.19 tonnes.

2. STSP Cloud Traffic Control Center

STSP has established the Cloud Traffic Control Center, and the AI dynamic signs installation and operation have been completed. Through the intersection image recognition camera, the real-time traffic flow is collected, the travel time of the GVP road sections can be collected to grasp the real-time traffic condition. The multiple data are used as the basis for decision-making, real-time download of the time-based plans that meet the characteristics of the real-time traffic conditions to enable the relief efficiency of main roads in the park area. According to the analysis results, the average travel time can be reduced by 7% where the dynamic signs are installed, which is equivalent to saving about 42,270 liters of fuel consumption every year after conversion, reducing the carbon emission by 95.66 tonnes/year (equivalent to planting 9,566 trees). In addition, the traffic characteristics investigation and timing system adjustments were carried out for the main roads, and the travel speed of the whole line increased by 1.9%-12.9%. The fuel consumption saved was approximately 24,437 liters/year, reducing carbon emission by 55.30 tonnes (equivalent to planting 5,530 trees).

The Cloud Traffic Control Center also strengthened the APP of Science Park Action Wizard 2.0, enabling the release real-time information and push notification of accidents or incidents observed, effectively releasing information as early as possible for road users to divert their routes. According to 2022 statistics, there were 17 accident information released by the center, and the time saved by diverting traffic to reduce traffic congestion reached 4.25 hours (255 minutes).

▸ Commencement of Access Roads

The access roads on the south and north sides of Tainan Science Park have been commenced successively. On the south side, the third phase north orbital expressway and on the north side, the north access road in the northwest district (RD16-49) have been commenced on October 18 and 25, 2022, respectively. The commencement of the new roads can effectively relieve the traffic flow on the south and north sides, improving the quality of traffic to and from STSP.

The third phase north orbital expressway construction project starts from Rd. No. 2-7 in Annan District on the right bank of Yansui River, crossing National Highway No. 1, connecting to the STSP phase one access road in the east. The overall length of the main line is approximately 4.826km, which has been commenced for use on October 18, expecting to ease the traffic flow between the Sinckan Blvd. and Taijiang Blvd. section.

According to the third overall review of STSP Specific Area Plan (science park section), it was approved to open a new north access road in the northwest district (RD16-49) as the major northward access road in the northwest district in Tainan Science Park. This newly constructed road has been commenced for use on October 25. Great relieve of the traffic flow on Shanhua Route No. 178 during rush hours and diversion of the traffic flow into the north side of the park can be observed. The opening of this road section has greatly helped with the traffic on the north side.

Schematic diagram of the third phase north orbital expressway

Schematic diagram of the north access road in the northwest district (Beiyuan 5th Rd.)

+ Complete the park functions to create a LOHAS art and culture in STSP

Other core goals involved

4 QUALITY EDUCATION

Implementation content and promotion results

1. Introduction of industrial and commercial life service industries

The Bureau provides park manufacturers with faster and more convenient services. The 12 categories of industrial and commercial services in the science park include banking and finance,

post office, securities, travel agency, accounting, law, equipment service providers, electronic material agency and sales, consultancy, telecommunications, inspection and verification and customs clearance services to address the needs of park manufacturers. STSPB aims at creating a high-quality environment with high efficiency, safety, health, and comfort to attract industries and talents. Life service industries such as catering, shopping, exercise, leisure, childcare, and after-school classes are introduced. Please check the official website of STSPB for detailed information.

STSPB continues to improve the service quality by innovating business service functions and trying out different types of business service models. For example, we facilitate the cooperation between the catering industry in the park and the food delivery platform, assist the restaurants in the park to sign contracts for providing meals regularly, introduce the mob flash of fat truck selling foods in the community center, provide park manufacturers with more diverse services and pursues for better service quality to allow all park manufacturers to be able to focus on their specialty with peace of mind in an environment with high-quality software and hardware, and jointly create a better park with work-life balance.

STSP Official Website

▸ Opening of New Business Circle at Management 1 Zone at the KSP that offers more convenient life amenities

With the opening of the new shopping circle at Management 1 Zone at KSP, stores such as a café and convenience stores have entered the shopping circle, creating a relaxing and leisure space with the provision of coffee, desserts, food, beverages and convenient services such as ibon and ATM. In addition to introducing a café and convenient store, an e-vehicle charging station was also established. This shopping area awaits the public and the employees at KSP to enjoy the relaxing time and atmosphere here.

In Kaohsiung Science Park, convenient public facilities such as the baby care center, a post office providing postal services, and Bank of Taiwan, as well as a multi-functional sports park for the employees to exercise after work are provided. In addition, Kaohsiung Show Chwan Memorial Hospital is also expected to be open for operation in 2024. Kaohsiung Science Park will continue to create a more convenient and comfortable living circle and provide a better working environment for enterprises.

Owin 1 Fitness Center

Step on the flywheel equipment to exercise together

Owin 1 Fitness Center continues to welcome all to make use of the facilities, including aerobic training and weight training, both for physical training for different purposes. Aerobic training facilities are used for aerobic exercise, including treadmills, slide machines, flywheels, rowing machines, steppers, upright bikes, etc. Weight training facilities include equipment for muscle strength training, such as the chest press machine, lat pulldown, 3D Smith machine (including pull-ups, barbell squats, bench press, deadlifts), and dumbbell training area. There is also a large mirror to check whether the movements are correct. The multiple and diverse training can meet fitness needs for all. In the gym, users can choose suitable fitness equipment based on their needs. Exercise for 45 minutes a day, the muscle strength, endurance, cardiopulmonary, core, and sense of balance can be improved to further maintain health and perfect body figure. The fitness center also cooperates with the epidemic prevention policy and is regularly disinfected for users to exercise happily and safely.

2. Art and culture events and good-neighborly activities

STSPB actively accumulates the soft power of art and culture, and is devoted to the promotion of art and culture events and concerts and organizing art exhibitions to provide rich and diverse cultural experience in the park. At the same time, good-neighborly activities are also an important part in the science park. Through various activities, the bond between people can be enhanced. By combining the art and culture events and the good-neighborly activities, the interaction and bond with the residents can be promoted, which can further improve the quality of life in the park area, creating a vibrant and charming STSP.

Exhibitions in Hsing-Kuang Hsier Local Culture Hall

Hsing-Kuang Hsier Local Culture Hall is a structure with the combination of religion and culture, with the second floor being the temple and the first floor being the Culture Hall for the exhibition of artworks from local individual artists (Xinshi, Shanhua and Anding Districts and the surrounding areas), joint exhibition of art society members, and works for art class at schools. At least 5 sessions (and more) of exhibitions are arranged every year, and there will be some members explaining the works in a guided tour on the spot. Every April is the most beautiful blooming season around this area. There are so many visitors here and there on the trail around the lake and the blooming pink orchid trees that take pictures and enjoy the picnic on the lawn.

As the epidemic condition eased in 2022, the Xingan Community Culture Museum started to resume holding the opening tea party of the exhibitions under the premise of cooperating with the government's epidemic prevention policy. A total of 7 exhibitions and performances were held, attracting many art lovers and families to visit and have exchanges. This is especially a

place suitable for parents and children to travel together, making STSP not only a high-tech park but also a park with rich culture and natural ecology, namely a place with balanced development of technology and humanities.

Joint Exhibition of Four Gentlemen

Individual Exhibition of Wang Zi-Yin's Traditional Chinese Realistic Painting

STSP Late Spring Art Event

Every March and April when spring comes and flowers bloom, STSPB will organize concerts combined with art and culture element for 4 weekends, allowing park employees to relieve their stress of daily life, improve the quality of life at STSP, and enhancing the exchanges and bond among employees in an interactive, fun, and musical way. The music performance is presented by Innolux's Karaoke Club, UMC's Guitar Club, as well as school students from the neighboring middle schools and primary schools for young people to show their youthful confidence and vitality. With this charming and diverse musical event, the STSP Late Spring Art Event provides the public with a relaxing and leisurely afternoon.

Sports Events in the STSP

STSPB promotes exercise in the science park. In 2022, the Bureau continued to organize the Exercise at STSP, the sports events include the Thousand People Fitness Walking, online hiking, STSP CUP ball games and so on, once again setting off a trend of exercise in the science park. Among them, the fitness walking event invited the professional badminton player, Tai Tzu-Ying to be the spokesperson for the fifth time. The ball games were participated by 3,289 players from 166 manufacturers, showing the health and vitality of STSP.

STSP Thousand People Fitness Walking

The professional badminton player, Tai Tzu-Ying, showed up at the STSP badminton friendly match

STSP CUP Friendly Neighbor Softball Game

Online hiking

Christmas at STSP

To embrace the coming of Christmas and New Year, STSPB held a Christmas Party & Holiday Lighting Ceremony with the theme of “2022 Christmas at STSP” at Puxin Park on the evening of Dec. 23. All the lights decorated in the park were lit up when the night fell, and there were a number of wonderful performances at the Party. Free hot food was also provided to warm the participants’ stomach and for them to spend a warm night. At the end of the year, 17 park manufacturers including TSMC and UMC were invited to put up decoration lights at important intersections in the park area. People coming to STSP could enjoy the beautiful and unique

lighting in many places around STSP. These decoration lights would continue to be lit until the Lantern Festival of 2023. The Bureau sincerely wished every member of the STSP big family a bright and happy new year, embracing a happy 2023 when everyone can realize their dreams!

Love Never Stops

Since 2015, STSPB has worked with Rotary Club Nanke and World Vision Taiwan to raise funds and jointly promote the STSP Charity Month with the purpose of “Care for the Locals, Let Love Grow Roots” to gather love and care at STSP and bring hopes to the disadvantaged for emergency medical care and other needs in the surrounding areas of Tainan and Kaohsiung Science Parks.

STSP Charity Month supports the Tainan City Social Assistance Account for the Housing Improvement Implementation Project for Disadvantaged Families in Tainan City to improve the basic life and quality of living for the disadvantaged families. In addition, we also continue to work with World Vision Taiwan and Luway Opportunity Center to provide subsidies in medical and emergency, early treatment for people with disabilities, and living environment improvement, so as to relieve the financial pressure of disadvantaged

families and improve their quality of life. STSP Charity Month has been implemented for eight years, and the cumulative funds raised so far totaled NTD 19.17 million.

As of the end of 2022, the cumulative funds of NTD 15.20 million have been distributed to 4,089 people from 1,279 disadvantaged households in Xinshi, Shanhua and Anding Districts where Tainan Science Park is located and Luzhu, Gangshan and Yongan Districts where Kaohsiung Science Park is located.

Item	Participating manufacturers	Amount of total donation	Number of recipients	Number of aided households
1st Year	31	NTD 715,612	211	58
2nd Year	29	NTD 1,572,720	528	117
3rd Year	37	NTD 3,153,995	524	146
4th Year	29	NTD 2,118,565	671	228
5th Year	11	NTD 1,957,004	1,100	263
6th Year	31	NTD 1,812,773	431	183
7th Year	16	NTD 3,870,414	624	284
8th Year	33	NTD 3,972,828	-	-
Total	-	NTD 19,173,911	4,089	1,279

Note: The funds raised for the eighth year (2022) will be used in 2023. Therefore, there are no data of recipients and number of households yet.

3. A Visit to Museum of Archaeology

Museum of Archaeology, Tainan Branch (STSP Museum of Archaeology) has an area of 2.44 hectares and is located next to the Administration Building of STSPB. STSP Museum of Archaeology has a unique exterior design, and it contains more than 8 million cultural and archaeological relics, all were unearthed with the development of STSP, reflecting the profound context of craft and cultural life of this land. We organize various activities, promote education and special exhibitions to show the unique contemporary prehistoric scenery of STSP and invite the public to come to know and cherish this rare cultural park area.

Lecture Activities for Park Manufacturers

This lecture introduced the work content of site supervisors and relevant laws, regulations and notification mechanism of archaeological sites. Through the sharing of cases in Tainan area, the manufacturers can be more familiar with the professionalism and administrative procedures of site preservation, and their professional knowledge of archeology and site preservation in STSP region was further strengthened. A total of 37 people participated in the lecture activity this year.

Lecture activity

An Archaeological Tour in the STSP

This time, the museum cooperated with schools and arranged students to have an archaeological tour, planning to combine the unearthed cultural relics at STSP to carry out the experience of felting bark to make cloth so that the students can experience and even start to have interest in prehistoric culture during the process of imitating prehistoric craftsmanship. The museum staff also shared their work content and the process for cultural relics rectification to help those interested to have a better understanding of art and culture. A total of 246 people signed up for this event.

An Archaeological Tour in the STSP

Archaeological DIY Event at the Museum of Archaeology

With the integration of historic culture, unearthed cultural relics, and transforming archaeological knowledge into artistic handicrafts, this time the three series of activities is set to provide the DIY for handicrafts suitable for parents and children to have fun together. Teaching plans with different themes were designed for school children as the user groups, and the archaeological elements for Art Therapy were integrated into the desserts. The public could obtain knowledge while also enjoy the leisure activities. The series activities attracted a total of 746 participants.

Archaeological DIY Event at the Museum of Archaeology

The Museum of Archaeology celebrated its 3rd anniversary on October 19, 2022, and the theme for the International Museum Day in 2022 happened to be “The Power of Museums”. Therefore, the museum linked the three issues that brought positive impact on society, namely sustainable development, digital innovation and community education with the axis of “the future life”, combining the SDGs in the planning of the content of multiple activities, including interactive games in the museum, food market outside the museum, sustainable flea market, Uncle Fat’s Storytelling, and Surprise Museum Train. It is hoped that everyone’s future life can be implemented in the spirit of sustainable development. The Museum of Archaeology also looks forward to using the concepts of sustainability and diversity to explore the possibility of integrating archaeological research topics with international sustainable indicators, expanding the content of archaeological science to respond to contemporary social issues.

3rd anniversary series activities

+ Low-carbon ecological communities and buildings for environmental symbiosis and mutual benefit

Other core goals involved

Implementation content and promotion results

1. Ecological Community

STSPB has promoted green buildings to promote the co-existence and co-benefit of the buildings and the environment, implement the energy conservation of the buildings, and continue to reduce energy consumption and carbon emissions, making STSP the science park with the highest density of diamond-grade green buildings. Tainan Science Park and Kaohsiung Park have both obtained the label of diamond grade Ecological Community Evaluation System (EEWH-EC), accounting for 2/5 of the diamond-grade ecological communities in Taiwan, and the green building area accounts for 25.1% of the total building floor area of the park.

Statistics of Green Building Achievements

2021 Number of Green Building Labels/ Green Building Candidate Certificates					
Certified cases	Bronze cases	Silver cases	Gold cases	Diamond cases	Total
16/21	3/2	8/2	8/1	17	78

STSPB has been committed to constructing an excellent manufacturing environment with the values of Production, Living, and Ecology. Tainan Science Park was certified the diamond grade Community in 2013 and obtained the label of diamond grade Ecological Community Evaluation System (EEWH-EC) in 2016. We continue the promotion of the ecological community balance and promote the concept of sustainable ecological environment. In 2021, we obtained the EWH-EC Green Building Mark once again, and this time we applied assessment change under three main axes. On the basis of the existing indicator, the “renewable energy” was added. In 2022, the Kaohsiung Science Park also obtained the certification of the renewal of the ecological community label, and the green building label remains at the highest level- Diamond Grade, showing that STSPB’s long-standing efforts for its original intention of maintaining the sustainable development and an eco-friendly environment.

2. Greening of Landscape

To create a colorful image of the diversity of the planting belt along the main roads of Tainan and Kaohsiung Science Parks, the Bureau continuous to plan the landscape improvement project in the science parks every year to replace poor-growing arbores or aging shrubs. The overall landscaping is based on a people-oriented perspective with the concept of multi-layered planning. Seasonal patterns and color changes are chosen to match the areas around the park in four seasons to show rich and colorful scenery. The overall landscape is all refreshed after the greening and beautification of the park area is completed.

Park Planting Statistics

Item	Year	2020	2021	2022
Arbores	Tainan Science Park	123,219	116,155	118,118
	Kaohsiung Science Park	92,293	86,855	91,107
Shrubs	Tainan Science Park	537,635	543,733	545,591
	Kaohsiung Science Park	139,976	160,224	188,291

Note:

1. The above-mentioned statistics is the greenery amount in public space, park, green space, and factory area.
2. There are still development projects in progress in the public area in Kaohsiung Science Park, including the area of newly planted shrubs. Therefore, after the completion of the projects, the maintenance unit in the science park will take over the shrub area. As the factory expansion projects increase, more shrubs will be planted, and there will be more increase in shrubs areas.

Cosmos flowers at the Yinxi Lake in Tainan Science Park

Fire-cracker vines at the Dazhou Drainage Pavilion in Tainan Science Park

Gliricidia sepium at the Yinxi Lake in Tainan Science Park

Bead Tree at the Yinxi Lake in Tainan Science Park

Rosy Trumpet Tree at the Gongqi Park in Tainan Science Park

Sunflowers in the Administrative Service Area in Tainan Science Park

Golden Shower Trees at Park 17 Mall in Tainan Science Park

Golden Phoenix Trees on Nanke N. Road in Tainan Science Park

Golden Trumpet Trees on Huandong Road in Tainan Science Park

Orchid Trees at Titan Lake in Tainan Science Park

In the face of so many fallen leaves and branches, the Bureau started to establish a green resources recycling plant in Tainan Science Park where fallen leaves are mixed with organic cane fertilizers to make compost. Large residual branches are crashed into wood chips using wood chippers and are scattered in the green landscape planting belt in the science park. In 2016, the establishment of the green resource recycling plant in Kaohsiung Science Park was also completed for the sustainable use on the land of STSP. In 2022, Tainan and Kaohsiung Science Parks totally produced 773 tons of deciduous compost and 152 tons of wood chips. Based on the statistics, a total of 6,533 tons of compost and 2,654 tons of wood chips were produced during 2013 and 2022.

Cycling Trips

To promote eco-friendly, cost-saving, healthy and stress-relieving cycling activities, STSPB and the Cycling Clubs of the park manufacturers co-organized cycling trips. The activity was divided to two groups. The roaming group had a biking trip to Wushantou Reservoir while the endurance group had a biking trip to Nanhua Reservoir, about 133km bike round trip. There were 135 participants in total.

The roaming group biked in Wushantou Reservoir

The endurance group went as far as to Nanhua Reservoir

+ Spreading awareness of ecological protection

Other core goals involved

Implementation content and promotion results

1. Ecological settlement

Due to the geographic location of the science park, it has a unique plain farming ecology. To make this fertile land of STSP a home for the aboriginals and passing visitors, the Bureau has

specially planned a 30-hactare land for ecological protection to conserve bird habitats, due to the geographic location of the science park, it has a unique plain farming ecology. After years of efforts and planning, the Bureau has finally created abundant ecological resources in the science park today, including grassland, shrubs, detention ponds (for flood prevention), ditches and so on, covering the diverse habitats of the plain and attracting diverse creatures that forms aggregation in the science park and it has become the best demonstration of symbiosis between development and ecological conservation. The Bureau entrusts an ecological survey team to carry out regular ecological survey to analyze the changes in the number of the population. Observation and recording of the reproduction of protected species of birds were particularly carried out, which has also formed a unique ecological characteristic at STSP.The survey results in 2020 are as follows.

Park/Category	Birds	Amphibian	Butterfly	Odonata
Tainan Science Park	72 species and 34 families	5 species and 4 families	27 species and 5 families	20 species and 3 families
Kaohsiung Science Park	68 species and 34 families	5 species and 4 families	27 species and 5 families	19 species and 3 families

Among the birds observed, 7 species and 8 species are the protected bird announced by Council of Agriculture (not in the IUCN Red List) in Tainan Science Park and Kaohsiung Science Park respectively.

Item		Tainan Science Park	Kaohsiung Science Park
Endemic subspecies		Bambusicola sonorivox, Psilopogon nuchalis, Pycnonotus sinensis, Hypsipetes leucocephalu, Dendrocitta formosae, Prinia inornate, Cisticola exilis, Dicrurus macrocercus, Hypothymis azurea, Apus nipalensis, Accipiter trivirgatus, Phasianus colchicus	Psilopogon nuchalis, Acridotheres cristatellus, Pycnonotus sinensis, Hypsipetes leucocephalu, Dendrocitta formosae, Prinia inornate, Cisticola exilis,, Dicrurus macrocercus, Hypothymis azurea, Apus nipalensis, Accipiter trivirgatus, Phasianus colchicus
Protected species	Class III	Glareola maldivarum, Lanius cristatus	Glareola maldivarum, Lanius cristatus
	Class II	Rostratula benghalensis, Elanus caeruleus, Accipiter trivirgatus, Phasianus colchicusFalco tinnunculus	Acridotheres cristatellus, Rostratula benghalensis, Elanus caeruleus, Accipiter trivirgatus, Phasianus colchicus, Falco tinnunculus
Frogs		Duttaphrynus melanostictus, Hylarana guentheri, Fejervarya limnocharis, Microhyla fissipes, Kaloula pulchra	

Note: The protected species mentioned in this report are listed in the Schedule of Protected Species designated by Council of Agriculture of Executive Yuan in 2019.


Acridotheres cristatellus


Pica serica


Bubulcus coromandus


Psilopogon nuchalis


Motacilla cinerea


Amaurornis phoenicurus


Lanius cristatus


Pycnonotus sinensis


Himantopus himantopus


Motacilla alba


Alauda gulgula


Phasianus colchicus


Accipiter trivirgatus


Alcedo atthis


Elanus caeruleus


Glareola maldivarum

Tyto longimembris

In addition, the development of the Ciaotou Science Park not only focuses on the development of the technology industry, but also takes into account environmental conservation. Ciaotou Science Park uses the Gunshuiping Mud Volcano Park for environmental optimization to create a habitat suitable for Tyto longimembris. In addition, the Kaohsiung Science Park expanded the off0site and planned a nearly 20-hectare ex situ conservation for Tyto longimembris. In 2022, we successfully found Tyto longimembris on the perches in the park. STSPB actively implements the follow-up work for the conservation and monitoring of the Tyto longimembris. In addition, the Tyto longimembris Preservation Promotion Team has been established to make rolling reviews of the effectiveness of the conservation. It is hoped that the Tyto longimembris can become a symbol of Ciaotou Science Park, creating an industrial cluster where technology and environmental conservation coexist.

2. Disclosure of Park Ecological Information

On the roads park employees must use to and from work every day, and at every corner in the science park, many small creatures are inhabiting. To promote ecological conservation and restoration, the Bureau actively shares the ecological information through online media and introduce common species in the park with interesting pictures, texts, or videos, enabling the public to have a glimpse of the ecological resources and the wonders of nature. The concept of environmental conservation in the science park can also be promoted.

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3. Environmental Education

STSPB continues to organize environmental education and related activities that incorporate issues of water pollution control, waste reduction, natural environment exploration and disaster and flood prevention. Nanke Environment Education Park developed 4 courses, namely Source of Life- Water, Garbage Magician, Nature Explorer, and Rain and Me. In 2022, 4 sessions of Source of Life- Water Course were organized, with a total of 101 participants; 3 sessions of Garbage Magician were attended by 100 people in total; 6 sessions of Nature Explorer were provided to 171 participants; 1 session of Rain and Me was attended by 33 participants. Overall, a total of 14 sessions of environmental education courses were organized, and the total number of participants amounted to 405. We introduced more environmentally friendly concepts and measures to create a green science park with sustainable development. In response to the epidemic, measures such as disinfection and temperature measurement were implemented for physical classes. In 2022, two sessions of trial online course on “Origin of Life-Water” were held in 2022, with a total of 143 participants.

Source of Life- Water: Coagulation Experiment

Source of Life- Water: DIY of Water Filter

Garbage Magician: DIY of Recycled Paper

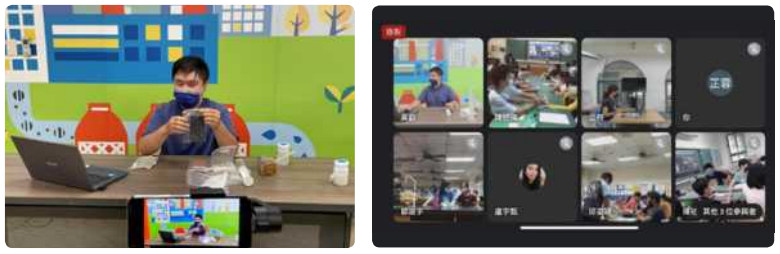
Garbage Magician: Visit a model of waste treatment process

Explorer: Observing outdoor plants and animals

Nature Explorer: Group game of small animals crossing the street

Rain and Me: photo taken in class

Rain and Me: Guided tour to the central control room of the Flood Control Center



"Origin of Life-Water" online course

4. Eco-Tour Activity

The Science Park has spared no efforts in promoting the concepts and actions of nature conservation. Therefore, it is hoped that colorful ecological experience can be enjoyed without destroying the natural environment so that we can get to know the preciousness and fragility of the protected areas and the biodiversity in Taiwan and further to take concrete and feasible eco-friendly actions in our lives. The eco-tour activity was held in 2022, with a total of 80 participants.

Fonghuanggu Bird and Ecology Park of National Museum of Natural Science

5. Adoption of Beach Cleanup

From 2017 to 2021, the Bureau responded to the Adoption of Coastal Cleanup initiated by Environmental Protection Administration and adopted the 500-meter coast along the Gold Coast in the South District of Tainan City. The Gold Coast has beautiful landscape, a soft and delicate beach and broad coastline. We led our staff to the Gold Coast for the beach cleanup to convey and implement environmental education in real actions, encouraging our staff to take actions

to protect the earth, assist in the maintenance of a clean coastal environment to contribute to the marine environment and take practical actions to remove the trash in the coastal area. The hours participated in Beach Cleanup Activity in 2022 amounted to 27 man-hours.

Resource Recycling Center's Beach Cleanup Activity

Advanced Planning

In the process of the construction and development of the science park, STSPB continues to have communication with local residents and make improvement based on the local resources and needs, which has not only stimulated the employment of the neighboring residents but also improved their quality of life, constructing convenient technology communities with cultural atmosphere. This successful experience will also be duplicated in the construction planning of new science parks, such as the Gunshuiping Geological Park (Ciaotou Science Park), Bajauliao Archaeological Site Reserve (Tainan Science Park Phase III), fully-functional living service area (Chiayi Park/Pingtung Park), National Experimental High School at PingTung Science Park, National Experimental High School at Chiayi Science Park and so on. In addition, we will try to introduce low-carbon industry as much as possible and encourage manufacturers to introduce green building design so that the overall science park can take into account Production, Living, Ecology, and further obtain the ecological community certification label.

Both the Tainan Science Park and Kaohsiung Science Park have detention pond parks constructed with ecological engineering methods. With the design of diverse habitats such as shallow water areas, deep water areas, and artificial islands, it has only the environment better than the one for single crop (agricultural land) before development. In addition, the number of species of birds discovered in the follow-up bird survey records has also doubled compared with that at the initial stage of development. Therefore, STSPB duplicated this successful experience and introduced the ecological detention ponds design into the new science parks (Ciaotou, Chiayi, Pingtung), aiming to not only bring employment and economic development to the local areas but also enrich the biodiversity in the communities.

Core Goal 13

Goal 13 Take urgent action to combat climate change and its impacts

Specific corresponding goals	Self-defined tracking indicators	Authority
Target 13.1 Strengthen resilience and adaptive capacity to climate change and reduce vulnerability.	Maintain and ensure the normal operation of various systems in the smart science park (chemical registration system, environmental monitoring information system, traffic control center database, smart building group database, portable disaster relief equipment, and flood prevention system).	Water, Electrical & Traffic Section
	Continue to handle the operation of the 24-hour emergency response center in the park area.	Industry Safety Section
	Implement at least 2 sessions of emergency response drills or related courses every year.	
Target 13.2 Implement the stage targets of GHG control.	Organize at least 2 sessions of seminars on environmental protection every year.	Environ-mental Protection Section

Challenges/opportunities faced

The impact of climate change caused by global warming is getting more and more significant. In the face of the uncertainty of the impact of climate change on the temporal and spatial scales, STSPB enhances the impact resistance of the park to respond to the operational challenges and opportunities brought by climate change through the implementation of intelligent management of the park that is linked with various response systems for disaster prevention and rescue. In addition, starting from 2017, STSPB has conducted GHG inventory of the park every year, cooperated with the inspection of air pollution prevention and control facilities and provided energy conservation counseling, aiming at reducing the emission intensity of the overall park area so as to ensure the sustainable development of STSP and the park manufacturer.

Specific actions and promotion highlights

+ Intelligent disaster prevention response system to improve the resilience of the park area

Other core goals involved

Implementation content and promotion results

1. Response systems in the park area

STSPB implements various emergency response systems and plans as well as the intelligent management of the park to stabilize the energy materials and respond to possible risks of disasters for sustainable development.

▸ Utilities Response System

The establishment of the emergency notification mechanism of the Utilities Response System can effectively improve the communication efficiency of abnormal water supply and power supply, enabling the STSPB to grasp the loss situation of the manufacturers in the shortest time possible and the park manufacturers to understand the cause of the abnormal water and electricity supply, facilitating the follow-up contingency treatment. Since the establishment of the Line Group for Water, Power and Gas Supply Committee in 2017, manufacturers can be notified immediately of the abnormalities through instant messaging so as to notify the repair unit to handle the situation and grasp the repair and restoration status, improving the efficiency of water and electricity emergency response.

▸ Disaster Response System

To achieve the purpose of immediate notification, rescue (treatment) and aftermath handling, the existing disaster prevention and response resources in the public and private sectors in the science park are integrated to plan a simple, feasible, unified and highly efficient disaster prevention and relief system. The “Implementation Plan for the Construction of a Joint Prevention and Response System at STSP” is formulated to promote the disaster prevention and relief system in the science park and establish a joint prevention and response organization and radio system. In addition, various technologies and experiences at home and abroad are also referred to for the development of Emergency Response Support System that is incorporated

with mobile devices, seismograph monitoring signals, flood control monitoring system and geographic information system. With the introduction of the geographic information system, location maps of tap water pipelines, drainage lines, power facilities and gas pipelines can be obtained and related information inquiries can be made. Main information of the villages within 3 km outside the science park is also included so that if the scope of disaster is likely to affect the surrounding residents, village information can be learned through diffusion simulation and the graphical interface so that immediate notification can be made to the liaison office of the village chief to ensure that disaster prevention and response procedure can be completed immediately.

Flood Prevention and Response System

To ensure smooth water drainage within and around Tainan and Kaohsiung Science Parks and to reduce possible floods and disasters as early as possible during flood season, personnel would be assigned for 24-hour monitoring. During the flood season between May 1 and Nov. 30 every year, when the Central Weather Bureau issues a land warning or torrential rain in the area where the science park is located, the flood prevention team is immediately established. There are three levels of alert, and resident personnel at all levels (maintenance manufacturers, flood control team members, deputy director-general) are required to be stationed for 24-hour monitoring in shifts within an hour after receiving notification.

Earthquake Early Warning and Smart Disaster Prevention System

To improve and integrate the park's disaster relief response capabilities to meet the needs of smart disaster prevention and relief, the Earthquake Early Warning and Smart Disaster Prevention System was established in 2017, combining various systems in the smart science park (chemical registration system, environmental monitoring information system, traffic control center database, smart building group database, portable disaster relief equipment, and flood prevention system), coupled with the risk assessment and disaster simulation calculations, the 3D visual disaster prevention and relief command system based on GIS (Geographic Information System) is established to rapidly provide integrated intelligence for the commander to make decisions. A total of 283 manufacturers and 10,773 chemical records have been registered in the Earthquake Early Warning and Smart Disaster Prevention System, and 2 domestic Utility Patents and 3 Invention Patents were obtained.

A total of 10 sessions were held in 2022. It is hoped that park business units can join the operation of the system to reduce the occurrence of occupational disasters.

The management instructions of chemicals is described as follows:

(1) When a business unit in the science park introduces investment, advocacy and review of occupational safety and health related matters are implemented. When the business unit has the plant building and land releasing meeting, the Bureau will remind the matters to be noted concerning construction safety and health before the construction. During the time after plant construction and before the commencement of mass production, propaganda, inspection, counseling, and joint inspections will be carried out to have a supervision and care in the entire process of the life cycle of the plant in the science park.

(2) We have established the Earthquake Early Warning and Smart Disaster Prevention System to control the chemicals of the park manufacturers and to enhance our disaster response capabilities.

(3) Follow-up Supervision Measures:

i . Implement labor inspections and cooperate with the fire brigade in the science park to implement joint inspection of public hazardous materials to compare the list of hazardous chemicals of the park manufacturers and the information registered in the Smart Disaster Prevention System. The deadline of information correction will be notified for inconsistencies found.

ii. Every season, there will be dedicated personnel to hasten the registration of chemicals and verification. In addition, external experts and scholars are also appointed to provide counseling to manufacturers on chemical storage and supervision methods.

2. Emergency response drills

There are diverse types of industries in STSP, and if not careful, accidents and emergencise like occupational disasters, earthquakes, fires, natural disasters and others are likely to cause major property losses and casualties. Therefore, various firefighting training should be organized continuously and should also be well-planned. We organize firefighting training with Industrial Safety and Environmental Protection Month activities to help park manufacturers strengthen the awareness and training of fire safety so that their employees can be familiar with fire disaster relief and equipped with emergency preparedness capabilities. Finally, we will continue to improve the overall firefighting capabilities in the science park through public emergency response drills.

Course	2022 Implementation effects
1.Real fire extinguishing training course	The training course was held in Kaohsiung Science Park on August 25, with a total of 67 trainees. The training course was held in Tainan Science Park on September 1, with a total of 76 trainees.
2.Relocation training of Joint Emergency Response Organization	The "Emergency Response Joint Defense Organization Relocation Training" was held on November 15-16 in Taiwan Fire Academy in Zhushan, with a total of 25 trainees.
3.Emergency response drill in Kaohsiung Science Park	A fire rescue and response drill was held in Cherng Tay Technology Co., Ltd. on November 4 (Fri.), with a total of 75 participants.
4.Emergency response drill in Tainan Science Park	The drill for emergency response wargame for critical infrastructure (power interruption) was held in Meeting Room 201 of STSPB on November 30 (Wed.), participated by 45 people.

Oil sump fire fighting practice training

First aid practice (AED and CPR)

Emergency Response Joint Defense Organization Relocation Training- fire training

Emergency response drill in Kaohsiung Science Park

Emergency response wargame for critical infrastructure (power interruption) in Tainan Science Park

+ GHG Management

Other core goals involved

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

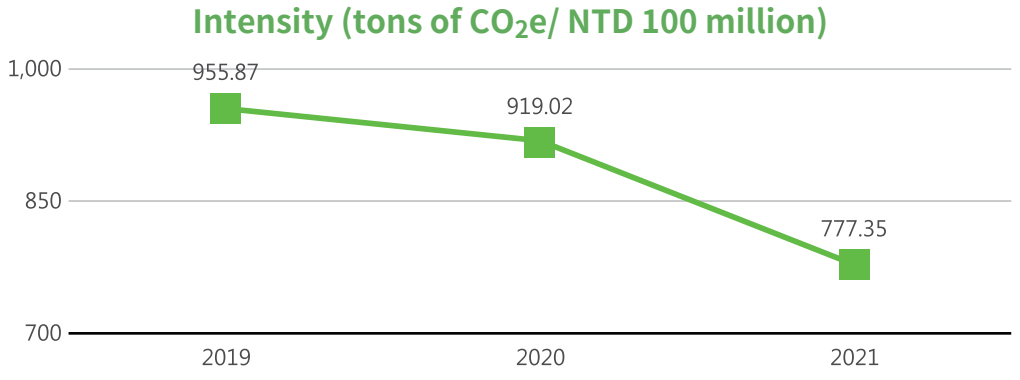
Implementation content and promotion results

1. Greenhouse Gas Inventory

STSPB continues to conduct annual GHG inventory, and the organizational boundaries of the inventory include Tainan Science Park and Kaohsiung Science Park. The expansion of the factories of business units continues while the park is in operation. To grasp the GHG emissions in the science park, the 2021 GHG inventory was conducted in 2022, and the total emissions of Scop 1+2 in 2021 amounted to8,511,072.78 tonCO_2e, and the GHG emission intensity dropped by 15.42% compared with 2020. Scope 3 was also included, with the emission of 1,179,472.24 tonCO_2e. STSPB actively conducted energy conservation counseling and measures while the park manufacturers also take carbon reduction actions in an attempt to reduce the environmental burden.

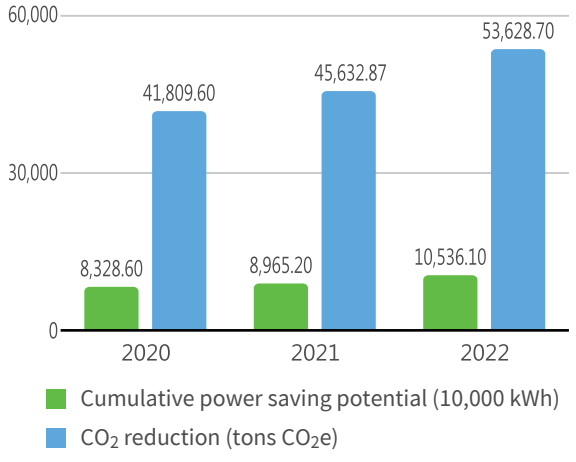
Item	2019	2020	2021
Scope 1 (tons of CO_2e)	1,308,597.47	1,501,050.07	1,576,648.88
Scope 2 (tons of CO_2e)	5,795,791.61	6,289,794.71	6,934,423.90
Total (tons of CO_2e)	7,104,389.08	7,790,844.78	8,511,072.78
Turnover (NTD 100 million)	7,432.35	8,477.31	10,948.84
Intensity (tons of CO_2e/ NTD 100 million)	955.87	919.02	777.35

Note:
1.The verification of 2021 GHG inventory was completed in October, 2022.
2.The GHG emission intensity was calculated with the total turnover of the STSP businesses for the current year as the denominator.



2. Counseling of Energy Conservation for Park Manufacturers

We handled energy conservation counseling for 6 park business units in 2022 and have completed counseling for 68 park business units so far since the implementation of the counseling service. In terms of the actual results of the energy conservation measures, the total power saved was approximately 10,536.1 million kWh annually, equivalent to the reduction of 53,628.7 tons of carbon dioxide emissions in a year.



Note: The power coefficient for 2022 was calculated with 0.509 kgCO_2e/kWh (in accordance with the table of GHG emission coefficient management v. 6.0.4 released by Environmental Protection Administration in 2021.

Visit to Toray Advanced Film Co., Ltd.

3. Briefing Session Related to Environmental Protection

For the park manufacturers to understand the development trend of national environmental protection control direction and environmental regulation management systems, 2 sessions of environmental related seminars, briefings or observation sessions were held based on the characteristics of the park or the needs of the manufacturers. The content of the meeting included filling in the application form for the permit, explanation of environmental laws & regulations and environmental issues, and observation of manufacturers with excellent environmental performance. STSPB hopes to improve the park manufacturers' familiarity of the regulations and grasp the trend of changes in the regulation before enforcement for early response. In addition, after the enforcement of the regulations, the manufacturers can have clear understanding of the content of the regulation for compliance.

To respond to the strengthening of air pollution control of the Environmental Protection Agency, an explanation session on Air Pollutant Control and Prevention Technology for Acid-Alkaline Discharge Pipeline was held on March 29, 2022. In addition, in response to the EPA's announcement of the revision of relevant laws and regulations on air pollution and the replacement of the data management system for water pollution source control, an explanation session on Regulations on Regular Inspection and Declaration of Stationary Pollution Sources and Operation of Water Pollution Source Control Data Management System was held on August 19.

Video conference on March 29

Video conference on August 19

▸ Stepping toward Net Zero Emissions, the collective effort among the industry, government, academia, and STSP

To respond to the climate change and the trend of net zero emissions, it has become an important issue for STSP to maintain the existing development of the science park, actively promote new construction and expansion of the science park while taking environmental sustainability into account. To this end, STSPB held a symposium on November 5 and specially invited EPA Minister Tzi-Chin Chang and relevant representatives from the industry, government, and academia to the symposium to give guidance.

During the symposium, Minister Chang gave a keynote speech on the country's strategies and practices in response to climate change. STSPB put forward relevant plans for carbon reduction and resource recycling in the park. On the other hand, representatives of park industries also raised issues of concern in the industry from the perspectives of enterprises, such as policy promotion, carbon rights, renewable energy, negative emission technologies, etc. Through the symposium, the industries can understand the goals and strategies for promoting net zero transition domestically in the future and the government departments can also refer to the views and pragmatic suggestions of enterprises when planning carbon reduction strategies and practical plans to jointly move toward the goal of net zero emissions by 2050.

EPA Minister Tzi-Chin Chang gave a keynote speech in the symposium, and had exchanges and discussions with the distinguished guests from the industry, government, and academia.

Group photo of the Director-General of the STSPB, Chen-Kang Su., EPA Minister Tzi-Chin Chang, and the distinguished guests after the symposium

Advanced Planning

With the UN Climate Change Conference in Glasgow (COP26) held in 2021, the establishment of the Carbon Emission Trading Mechanism among the state parties have been completed, indicating the official start of the global net-zero competition. Taiwan also responded to the Glasgow Climate Pact by announcing the Pathways to Net-Zero Greenhouse Gas Emissions by 2050. From then on, carbon reduction and carbon tax issues will become one of the items with significant impacts on corporate operations. STSPB started to promote energy conservation counseling in 2010, yet the overall carbon emissions have still kept increasing due to the expanded scale of the science park and the number of manufacturers. In the context of the incomplete domestic laws and regulations, STSPB can only keep paying attention to the development of environmental laws and regulations, and encouraging enterprises to invest in low-carbon production through publicity so as to respond to future regulatory impacts as soon as possible.

Future Outlook

Construct a technology corridor in southern Taiwan and create high quality net-zero life

Looking into the future, STSP will continue to promote innovative industrial development and grasp the world trends of digital intelligence, actively introduce academic and research technologies, enrich the R&D capacity of the park, and use of the spillover effect of the advantages of the mature ICT industry in Tainan Science Park to combine the third-phase expansion project of Tainan Science Park with the characteristics of local industries in Ciaotou, Chiayi Science Parks, and Pingtung Science Park for the development of emerging technologies, including semiconductors, smart machinery, smart vehicles, smart agriculture, precision health, smart agriculture and medicine, green materials, space technology and industrial innovation and other diversified industries, making the science park a hub for digital transition to boost the value adding of green transition, completing the technology corridor in southern Taiwan that is embedded in the global industrial value chain.

In addition to providing high-quality work opportunities, STSP will continue to work with local governments to strengthen life and education functions. National experimental high schools have been established to complete the educational functions, start the full-functional residential and commercial complex services, organize good-neighborly activities by integrated arts and culture, deepen the local culture and promote public education to jointly share the results of science park development. In addition, with the net zero emissions by 2050 as the goal, high-standards ecological reservation, expansion of multiple water sources, and guidance of the park manufactures are provided for them to use reclaimed water, introduce energy conservation, energy storage, and new energy creation technologies to drive circular economy by green technology. In addition, the smart service energy is integrated with the park traffic, sustainability, and governance, creating a new generation park with technology and environmental sustainability of mee four values of “Production, Living, Ecology, and Life”, fulfilling the National Science and Technology Council’s 2030 visions of innovation, inclusiveness, and sustainability.

Appendix I: Explanation of Compilation Methodology

About this Voluntary Department Reviews of SDGs

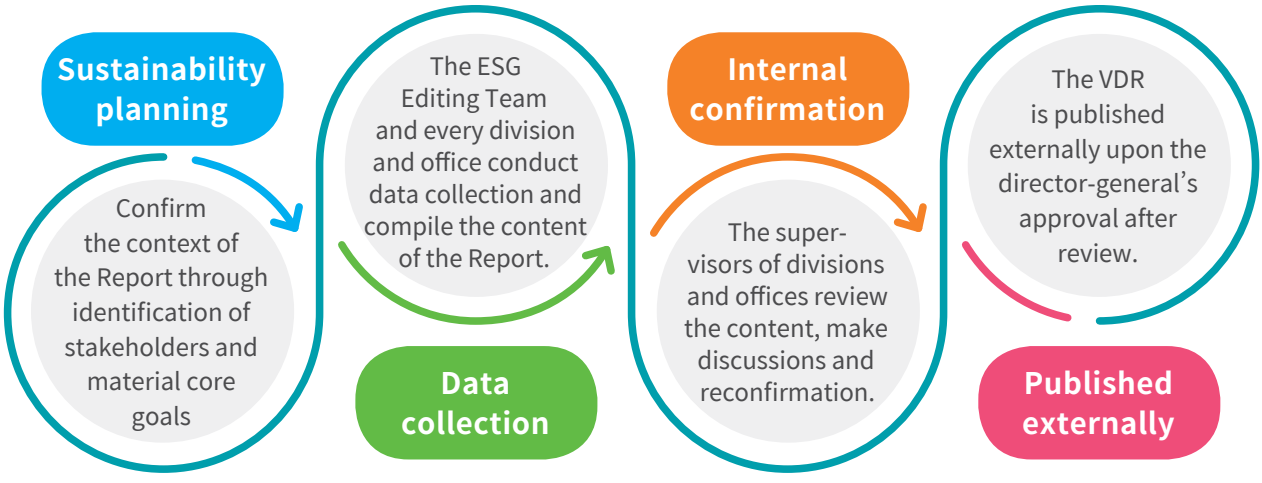
This is the first Voluntary Department Reviews of SDGs published by STSPB. The compilation principle and structure were in accordance with the suggestions of the Guidelines for Writing Voluntary National Review (VNR), detailing the process of STSPB's contribution to Taiwan's 2030 Agenda for Sustainable Development and the assistance with the promotion of Taiwan Sustainable Development Goals (T-SDGs).

Scope

The information in this Report covers the major core goals, development visions, and actions related to the axis of policy as well as the corresponding tracking indicator performance data of STSPB during 2022

Compilation process of the Voluntary Department Reviews of SDGs

The content of this self-inspection report is formulated by the ESG Editing Team. After confirmation by the heads of all business-related units, it will be approved and issued after being reviewed by the director.

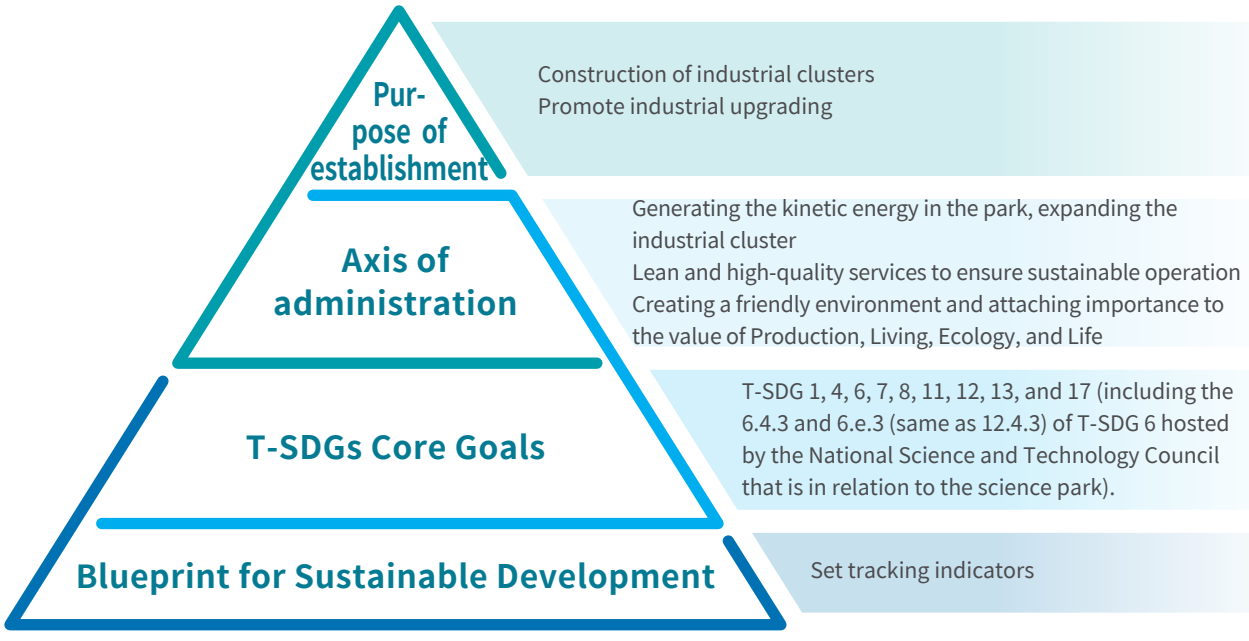


Structure of Report

To link the specific goals of T-DDGs with the actual businesses of the divisions and offices, STSPB adopts a four-level structure for the organization positioning and business inventory, combined with the questionnaires for stakeholders and management to identify the material core goals of the Bureau. The report editorial team conducted the discussions and adjusted the policy

axis in accordance with the current status of STSPB and set business tracking indicators that correspond to the specific goals of T-SDGs. Through the establishment of a complete review standards, the three aspects of the policy, management, and implementation can be aligned with the core goals of T-SDGs, constructing the blueprint for the sustainable development of the STSPB.

STSPB's four-level structure



Process and Results of T-SDGs Material Core Goal Identification

To be in line with the spirit of universal participation and inclusiveness in 2030 Agenda for Sustainable Development, STSPB distributed questionnaire to its stakeholders for the collection of opinions, combined with the views of the internal management, the STSPB's T-SDGs material core goals were identified in a systematic analysis mode.

Material core goals identification procedure

1 Identification of stakeholders

Through internal discussions within STSPB and by referring to the stakeholders identified in the same industry and other benchmark enterprises, the seven categories of stakeholders for 2022 were identified based on the AA1000 SES (Stakeholder Engagement Standards), including Employees of the Bureau, Park Businesses, Trade Associations, Local Government/Community Residents, Academic Institutions/Non-profit Organizations, Suppliers and Media.

2 Designed T-SDGs Questionnaire

The design of the questionnaire was based on the 18 major core goals, and each core spirit to each goal was integrated with the relevant business content of the Bureau into brief description to lower the threshold for reading for readers. Two major item groups (5-point scale) of "level of relevance" and "level of necessity" were designed for readers to understand the actual connotation of the core goals.

3 Questionnaire Survey

By distributing questionnaire, STSPB investigated the opinions of the internal management and stakeholders to evaluate the level of relevance among the 18 core goals and the business of STSPB, as well as the level of necessity for the Bureau to promote the core goals. A total of 198 copies of questionnaires were returned.

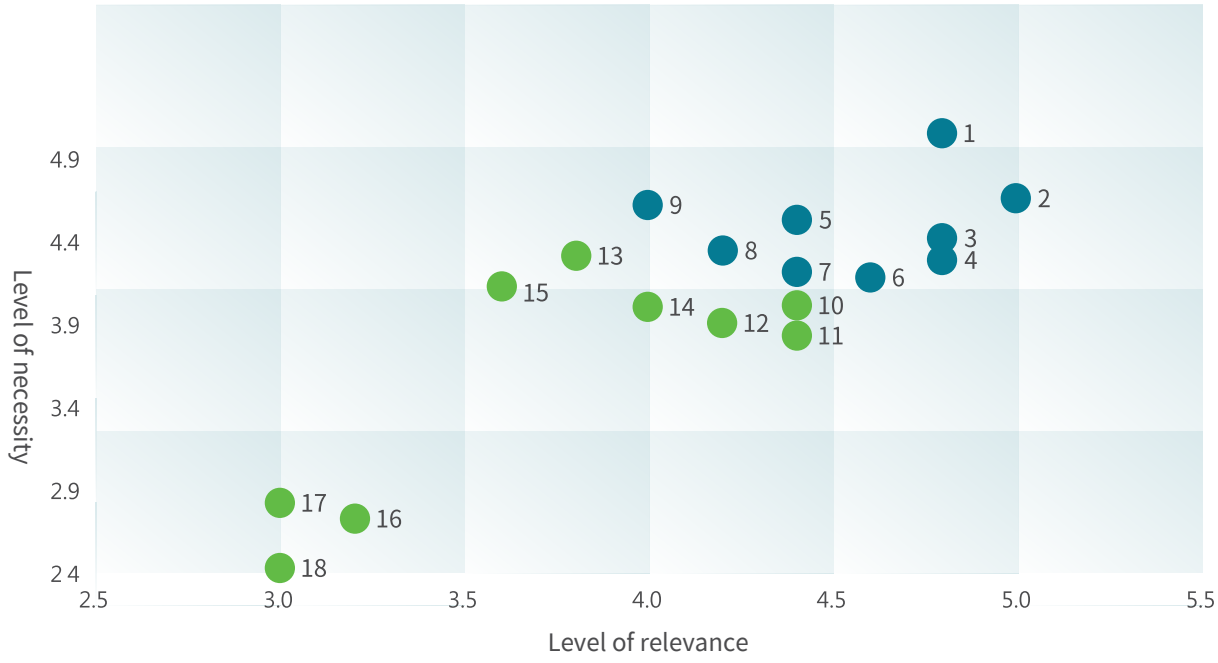
4 Materiality Analysis and Identification

Opinions and suggestions from external experts and scholars on the promotion of T-SDGs were collected, and the experts' opinions were included in the reference for core goal identification. In addition, based on the data of the distributed questionnaire, quantitative analysis was conducted, and relevant charts were drawn. Results were presented visually, and the "level of relevance" and "level of necessity" were used as the "materiality" indicators for the evaluation of every core goal to STSPB.

5 Review and Discussion

The identified results were discussed to confirm whether the existing policy approaches were covered in the relevant goals. Evaluation was also conducted for the assessment of the feasibility of promoting goals with the existing resources, and then more specific administration guidelines targeting at the major core goals were further set up. All relevant information is disclosed in the VDR.

After the compilation of the questionnaire analysis results, STSPB sorted the results in accordance with the scores. The top 9 core goals were listed as the major core goals of T-SDGs in the 2022 VDR, which are Core Goals 8, 6, 11, 12, 7, 4, 17, 1 and 13.



	Ranking	Item
Material Goal	1	 Goal 8 Promote sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all
	2	 Goal 6 Ensure environmental quality and sustainable management of environmental resources
	3	 Goal 11 Make cities and human settlements inclusive, safe, resilient and sustainable
	4	 Goal 12 Ensure sustainable consumption and production patterns
	5	 Goal 7 Ensure access to affordable, reliable, sustainable and modern energy for all
	6	 Goal 4 Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
	7	 Goal 17 Establish diversified partnerships and work together to advance the vision of sustainability
	8	 Goal 1 Strengthen social care services and economic security for the disadvantaged
	9	 Goal 13 Take urgent action to combat climate change and its impacts
Secondary core goals	10	Goal 10 Reduce inequality within and among countries
	11	Goal 9 Build affordable, safe, environmentally friendly, resilient and sustainable transportation
	12	Goal 3 Ensure promote healthy lives and promote well-being for all at all ages
	13	Goal 15 Conserve and sustainably use terrestrial ecosystems to ensure the persistence of biodiversity and prevent land degradation
	14	Goal 5 Achieve gender equality and empower all women and girls
	15	Goal 16 Promote peaceful and inclusive societies, provide access to justice for all and build effective, accountable inclusive institutions

Ranking		Item
Secondary core goals	16	Goal 2 Ensure food security, eradicate hunger and promote sustainable agriculture
	17	Goal 14 Conserve and sustainably use the marine ecosystems, and prevent the degradation of marine environment
	18	Goal 18 Build a nuclear-free homeland
The core goals hosted by the National Science and Technology Council that are in relation to the science park are Core Goals 6 and 12, including indicator 6.4.3: Water recovery rate of process water used by park manufacturers; Indicator 6.e.3: The recycling rate of park industrial waste (same as indicator 12.4.3); indicator 12.4.3: Reuse rate of park industrial waste (same as indicator 6.e.3).		

Release of the Report

STSPB will publish the Voluntary Department Reviews of SDGs every year, which is disclosed to the public simultaneously on the STSP sustainability related website.

Current issue: Published in August, 2023

Contact information

By issuing this Report, the general public and relevant stakeholders can better understand the endeavor and results STSPB has made and achieved to promote the development of the science park, and the feedback and opinions from all sectors serve as the basis for our continuous improvement. For any questions and suggestions, please contact us at any time.

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STSPB Sustainable Development Section

Appendix II: List of indicators tracking the promotion of T-SDGs

Indicator progress: ● 2022 targets achieved ○ 2022 targets not achieved ■ Not reaching statistical cycle

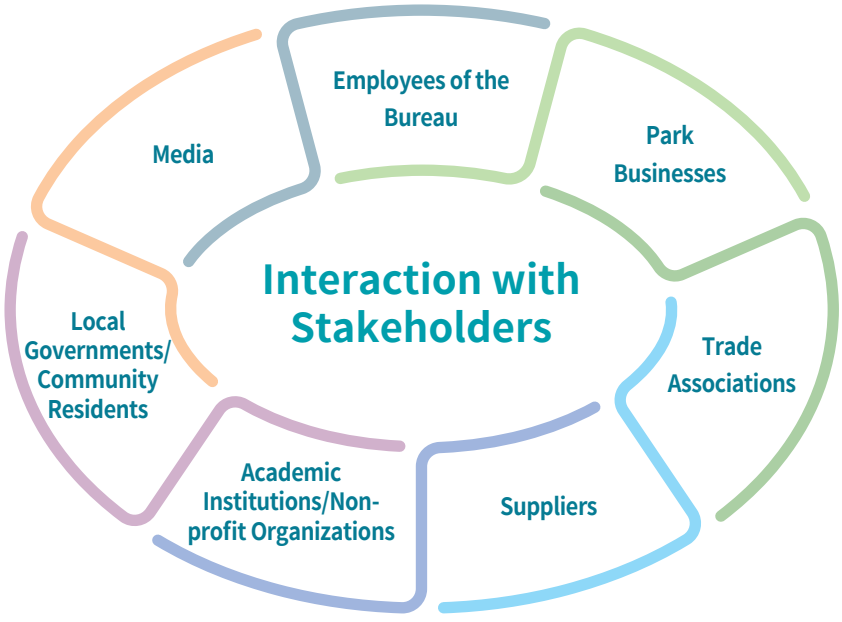
Core Goals	Specific goal	Custom topic	Indicator progress	Latest data (2022)	Basic value (2021)	2023 Target value
1	1.4	Number of start-up teams cultivated by the Start-up Workshop that found companies every year	●	6	2	2
		Number of start-up teams that are provided guidance to and participate in the From IP to IPO Program (FITI)	●	5	4	4
		Target number of new manufacturers introduced (including number of start-ups)	●	30(12)	20(10)	20(4)
6	6.3	Implementation of the management of permits for cap control application, and the sewage collection and treated ratio from the park factories	●	100%	100%	100%
		Compliance with the annual effluents standards from the sewage treatment plant	●	100%	100%	100%
	6.4	Continue to implement counseling of water conservation for park manufacturers, and the recovery rate of all manufacturers in the park reaches more than 75%	●	75%	75%	80%
		The amount of recovered industrial water used or exchanged in the park every year	●	8,000 tons/day	0	93,000 tons/day
	6.e	The waste reuse rate of Resource Recycling Center	●	93.19%	90.62%	90%
7	7.2	Increase the capacity of the solar PV equipment in the park	●	66.2MW	56.3MW	84MW
8	8.2	Number of reviews of subsidy of innovative technology and R&D projects (Science Park Emerging Technology Application Project)	●	8	6	6

Core Goals	Specific goal	Custom topic	Indicator progress	Latest data (2022)	Basic value (2021)	2023 Target value
8	8.6	Number of the courses with industry-university collaboration training subsidies (Science Park Talent Cultivation Subsidy Program)	●	12	10	10
		Hours of training for technical talents in the park (Professional and Technical Talent Training Plan)	●	330	300	300
	8.7	Number of publicity sessions of propaganda on gender equality every year	●	3	3	3
		Annual implementation of labor condition inspection	●	90	85	70
		Annual implementation of occupational safety and health inspection	●	896	926	400
		Annual implementation of on-site counseling of occupational safety and health	●	80	57	10
		Death rate per million of major occupational accidents	●	0	11.9	20 and lower
11	11.2	Annual days of operation of the e-shuttle bus and the Demand Responsive Transit Service (DRTS) in STSP	●	200 days and more	200 days and more	At least 200 days
		Average time for STSP Cloud Traffic Control Center to handle accidents	●	Within 15 minutes	Within 15 minutes	Within 15 minutes
	11.3	Hold at least 4 sessions of neighborly activities for local neighbors every year.	●	4 sessions	4 sessions	4 sessions
	11.4	Number of art and cultural exhibitions in the Hsing-Kuang Hsier Local Culture Hall	●	7 sessions	5 sessions	5 sessions
		Number of archaeology activities held in the Museum of Archaeology every year	●	1 sessions	1 sessions	1 sessions
	11.7	Percentage of green space in STSP	●	26%	26%	20%
		Percentage of green space in newly developed science parks	●	4%	4%	4%

Core Goals	Specific goal	Custom topic	Indicator progress	Latest data (2022)	Basic value (2021)	2023 Target value
11	11.7	The area of the ecological protection area in the science park.	●	20 hectares	20 hectares	20 hectares
	11.12	Percentage of Ecological Community Evaluation System (EEWH-EC) certification in STSP	●	100%	100%	100%
13	13.1	Normal operation rate of various systems in the smart science park (chemical registration system, environmental monitoring information system, traffic control center database, smart building group database, portable disaster relief equipment, and flood prevention system).	●	100%	100%	100%
		Normal operation rate of the 24-hour emergency response center in the park area.	●	100%	100%	100%
		Implementation of emergency response drills or related courses every year	●	2 sessions	2 sessions	2 sessions
	13.2	Number of seminars on environmental protection held every year.	●	2 sessions	2 sessions	2 sessions

Appendix III: Communication with Stakeholders

The seven major categories of stakeholders of STSPB include Employees of the Bureau, Park Businesses, Trade Associations, Local Governments/Community Residents, Academic Institutions/Non-profit Organizations, Suppliers and Media. Corresponding and smooth communication channels and platforms have been established in accordance with the attributes and needs of each stakeholder to understand their needs and expectations for the development of STSP, so as to plan a sustainability policy of the overall park.



Category	Significance to STSPB	Method of Communi-cation	Fre-quency	Participation in exchanges
Employees of the Bureau	It refers to all official staff in STSPB. With these associates, STSPB can be able to handle various businesses. Therefore, it is the top priority to understand their needs.	VDR question-naire, annual satisfaction survey, submission of annual reports	Once a year	In accordance with the objectives of the annual plan for the training courses for the employees, the total training hours for STSPB staff in 2022 totaled 6,864 hours, with an average of 42 training hours.
		Monthly report	Once a month	
		The director-general's mailbox, employee opinion survey	Immedi-ately	

Category	Significance to STSPB	Method of Communication	Frequency	Participation in exchanges
Park Businesses	Park businesses are an important factor for the existence of STSPB. The services provided by the Bureau all refer to the opinions from the park businesses for the development of policies	VDR questionnaire, annual satisfaction survey	Once year	(1) Conducted satisfaction survey of the park manufacturers. The result of 2022 was 84.53 points, an increase compared with the 83.74 points in 2021. Understand the needs of park manufacturers and set up improvement policies. (2) In 2022, the Bureau convened 1 session of Gender Employment Equality and Employment Discrimination Review Committee to discuss issues concerning regulations, discrimination cases and grievance channels. Among them, the reviewing process of 3 cases of sexual harassment in the workplace were completed. (3) Promotion of the recognition of workplace equality in the science park. In 2022, a total of 68 excellent employees and 4 excellent business units won the awards. (4) In 2022, a total of 986 sessions of labor inspection (896 sessions of occupational safety and health inspections and 90 sessions of labor condition inspections) were completed.
		The director-general's mailbox, STSPB Website, grievance channel	Immediately	
		Through auditing and counseling activities, labor training, and the nanny system	Immediately	
Trade Associations	The Allied Association for Science Park Industries serves as the communication bridge between STSPB and various sectors. Listening to the voice of the Allied Association enables the Bureau to understand the demands of the grassroots workers and to better protect labor rights.	VDR questionnaire	Once a year	In order to encourage park manufacturers to fulfill their responsibilities as corporate citizens and engage in public welfare activities and to strengthen the advantageous competitiveness of the industrial clusters and park manufacturers, and to provide opportunities for workers to enrich themselves, a total of NTD 144,000 was subsidized to the association for organizing activities such as lectures and symposiums.
		The director-general's mailbox、Subsidize activities	Immediately	
		Board of directors and supervisors meeting	Four a year	
		Member Congress	Once a year	

Category	Significance to STSPB	Method of Communication	Frequency	Participation in exchanges
Suppliers	The suppliers of STSPB are divided into three categories, property, labor, and engineering. For smooth and successful completion of various businesses and construction, communication with the suppliers is particularly crucial.	VDR questionnaire	Once a year	(1) To successfully complete the park satisfaction survey and service quality improvement business, communication groups with suppliers are established for immediate contact. (2) Hold work meetings on a quarterly or monthly basis to understand the implementation status of plans and exchange ideas. (3) Cooperate with the business needs of the STSPB and provide relevant information in reply to relevant inquiries. (4) Invite STSPB to jointly participate in the Innovation and Entrepreneurship Industry Exchange Meeting. (5) Assist with the preparatory project for new expansion parks. (6) Assist STSPB with the maintenance and management as well as team coaching in the field of innovation and entrepreneurship.
		The director-general's mailbox, STSPB Website	Immediately	
		Audit guidance, investment service mechanism	Immediately	
Academic Institutions/ Non-profit Organizations	Through the link with academic and research institutions, the academic research is introduced into practical application in the industry, which can help promote the upgrading of the park businesses.	VDR questionnaire	Once a year	(1) Linked National Yang Ming Chiao Tung University with Epistar Corporation and WiseChip Semiconductor Inc. for the combination of years of experience in LED/OPD and PRG signal research by the academic and research institutions, and jointly developed algorithms that can be applied to proximity sensing patches for biometric identification, estimation of heart rate, blood oxygen and blood pressure.
		The director-general's mailbox	Immediately	

Category	Significance to STSPB	Method of Communi-cation	Fre-quency	Participation in exchanges
Academic Institu-tions/ Non-profit Organiza-tions		Course training, subsidy program, free visit activities	Immedi-ately	(2) Linked the National Cheng Kung University with Ever Radiant Inc. and Symtek Automation Asia Co., Ltd., and self-developed the high-precision maskless UV exposure machine by the academic and research institutions, and established a complete research basis and experience in software and hardware related to maskless exposure technology, jointly completed the development of sacrificial layer for transfer nanoimprint process and equipment, which has become the key core technology of semiconductor advanced packaging.
Local Govern-ments/ Community Residents	STSPB and the local governments keep close contacts to exert the spirit of mutual assistance, assist local development, and take care of surrounding residents at the same time, bringing positive influence on local society.	VDR questionnaire	Once a year	(1) Organized 1 session of anti-corruption advocacy activity in 2022, with more than 100 participants. (2) Organized various good-neighborly activities such as sports activities, late-spring art events, and 2022 Christmas party for employees at STSP. (3) Link all relevant units, build a platform for park manufacturers to communicate and express opinions, and promote interaction and exchanges of opinions among park manufacturers, STSPB, local governments, and other units.
		The director-general's mailbox, STSPB Website	Immedi-ately	
		Club activities, public welfare activities	Immedi-ately	
		STSP Development Communi-cation and Coordination Joint Committee	Four a year	

Category	Significance to STSPB	Method of Communi-cation	Fre-quency	Participation in exchanges
Media	To maintain the image of STSPB, we strive to achieve effective communication with the media, so as to avoid minor accidents from seriously damaging the public's impression on STSP.	VDR questionnaire	Once a year	(1) Update the process of press releases, specifying the rules for providing advance drafts and official press releases after the event for major events in the park. (2) Proactively contacted the reporters for major events and published more than 10 pieces of news, such as the press releases of the monthly review meeting, forums in Chiayi and Pingtung Science Parks, Exercise at STSP, STSP Charity Month, Semicon Taiwan, Bio Asia Taiwan, which would be published in major newspapers such as Economic Daily News and Commercial Times the following day.
		The director-general's mailbox, STSPB Website, spokesman	Immedi-ately	

STSPB attaches great importance to the communication with its stakeholders. Through the establishment of various websites, major information and news on the Southern Taiwan Science Park Official Website is released on both regular and irregular basis, providing related publications for the stakeholders to download and read. Through the use of charts and simple texts, readers can understand more easily the expectations, efforts, and performance in terms of sustainable management while providing real-time as well as correct information of the science park to the stakeholders. In addition, the English version of the VDR is also published for international exposure.

In addition, STSPB have also established the FB Fanpgae, STSP 543, to share life and events in the park, so that the stakeholders can get closer to STSP.

STSP Official Website

STSP's CSR Website

STSP Annual Report

STSP Newsletter

Sustainable Green LOHAS Website

Industrial Safety Newsletter

STSP 543

STSP Public Art

To listen to the staff's voices, STSPB has set up various communication channels such as the Director-General's mailbox in the Secretariat Office and the complaint hotline of the Personnel Office and other compliant channels. Meanwhile, through various programs and plans, we help our staff solve problems that could affect work efficiency and enhance their centripetal force and cohesion for the Bureau. Through various assistance measures, we create a warm and caring working environment and a corporate culture with great interaction to enhance the competitiveness of this organization.

Satisfaction Survey of the STSP

STSPB conducts a satisfaction survey on park manufacturers every year. The content mainly focuses on 6 aspects, including the park image, park development resources, park service quality, overall satisfaction, compliant handling, and loyalty and trust. According to the 2022 survey results, the overall satisfaction of STSP scored 84.53 points, an increase compared with 83.74 points in 2021. Among all the aspects, park image scored the highest at 86.11 points. Indicators with significant drop in the scores compared with 2021 are the industrial and commercial service functions and the stability of power supply quality. The reason for the score drop in industrial and commercial service functions was mainly because of the lack of catering services in Kaohsiung Science Park, and convenience stores, cafes, compound restaurants have been successively introduced. For the indicator of the stability of power supply quality, the survey was conducted during the power outage incident in Taipower Xingda Power Plant on March 3, 2022. In this regard, STSPB has held a major power incident meeting with Taiwan Power Company and the Allied Association for Science Park Industries. For the human error part, Taiwan Power Company has reviewed and improved the management, system and operation

aspects to strengthen the quality of power supply and avoid accidents from reoccurrence. In addition, STSPB has also established a LINE@ group, which will inform park manufacturers of the power supply status in a timely manner. In addition, the electrical equipment maintenance and the publicity of strengthening the high and low voltage testing were conducted at the same time. Overall, STSPB has discussed the feedback of park manufacturer, set up improvement policies, continued to pay attention to the needs of the stakeholders and provided them with assistance and services.

Grievance Channels

To listen to the voices of the stakeholders, the Bureau has established grievance channels. Among them, the Director-General's mailbox is the one most people used for complaints, accounting for nearly 80% among all. When a complaint is received, classification is immediately made, and based on different business scope, the corresponding units have to respond to and handle it. All the letters from the public will be responded by the corresponding unit within three days, and the handling situation has to be reported to the first-level executives every month.

In accordance with the prescriptions stipulated in the "Major Points of the Executive Yuan and its Subordinate Organs for Handling People's Petition Cases", when it requires interviews, hearings or investigations in the handling of general petition cases, it shall not take more than 30 days. According to the statistics between January and December in 2022, there were a total of 406 petition cases, among which, 372 cases were handled through the Director-General's mailbox while 34 were through external complaint letters. All of the complaints were fully responded and solved.

Tel: +886-6-5051-001 (Tainan Science Park); +886-7-607-5545(Kaohsiung Science Park)

Director's email: service@stsp.gov.tw

Director of Personnel Office complaints hotline : +886-6-505-0848

STSPB Address: No. 22, Nanke 3rd Rd., Xinshi Dist., Tainan City ; No.23, Luke 5th Rd., Luzhu Dist., Kaohsiung City

Accessible environment complaint hotline: +886-7-607-5545, ext:7123; Contact person: Wen-Chien Chang

2022	Cons-truction Manage-me	Environ-ment & Labor Affairs Division	Business Division	Secre-tariat	Planning Division	Land Develop-ment Division	Invest-ment Services Division	Person-nel Office	Accoun-ting and Statis-tics Office	Civil Service Ethics Office	total
Number of petitions received	2	22	2	2	0	5	1	0	0	16	50
The Director-general's mailbox	250	74	7	1	4	27	8	1	0	0	372

Report of Public Integrity Incidents

Tel：+886-6-5051001#3005、3002 (Civil Service Ethics Office)

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