

PEROVSKITE

Perovskite NEXT! Leading the Solar Energy Revolution



台灣鈣鈦礦科技
Taiwan Perovskite Solar Corp.

COMPANY
PROFILE



Group Introduction

TENLife Group focuses on renewable energy, smart health, eco-friendly initiatives, and talent development. Companies within the group adhere to the core values of "sustainable environment and mutual prosperity". By Information and communication technology (ICT), Internet of Things (IoT), and Big Data analytics, the group offers customers integrated online and offline services.

Renewable Energy Business Group



台灣鈣鈦礦科技
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Nanohesive
奈赫先進科技股份有限公司

钛曜新能源

Career Development Business Group



TENLife



天來人才

Environmental Sustainability Business Group



舞雲智網



Net Zero
Innovagion
淨零創新有限公司



ECO CLOUD



GreenLife



綠來新纖
GaiaRight

Net Zero Building Group



Artificer
Intelligence
Zero emission
風光淨零

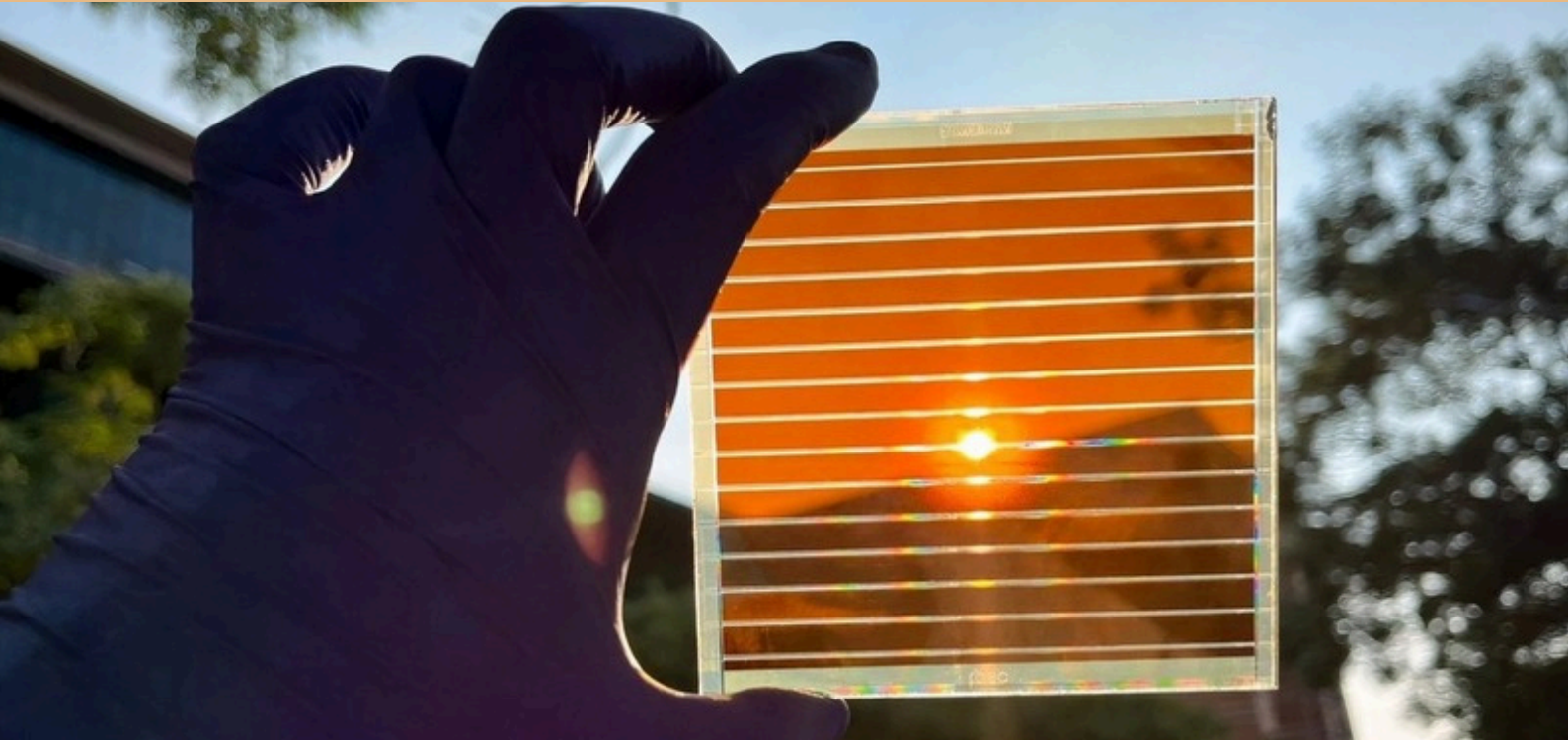
Enterprises under the TENLife Group encompass domains such as perovskite solar energy, carbon management, circular economy, smart agriculture, health care, and talent management. TENLife group is dedicated to using technology as a tool to achieve a better quality of life for humanity. Rooted in Taiwan with an eye on Asia, TENLife Group aims to provide integrated services aligned with ESG values to global customers through the mindset of Service 4.0 in the future. We will exceed every customer's expectations with "high-quality, innovative field services."





台灣鈣鈦礦科技
Taiwan Perovskite Solar Corp.

About Us



Third-Generation Solar Energy Complete Solution



Material



Equipment



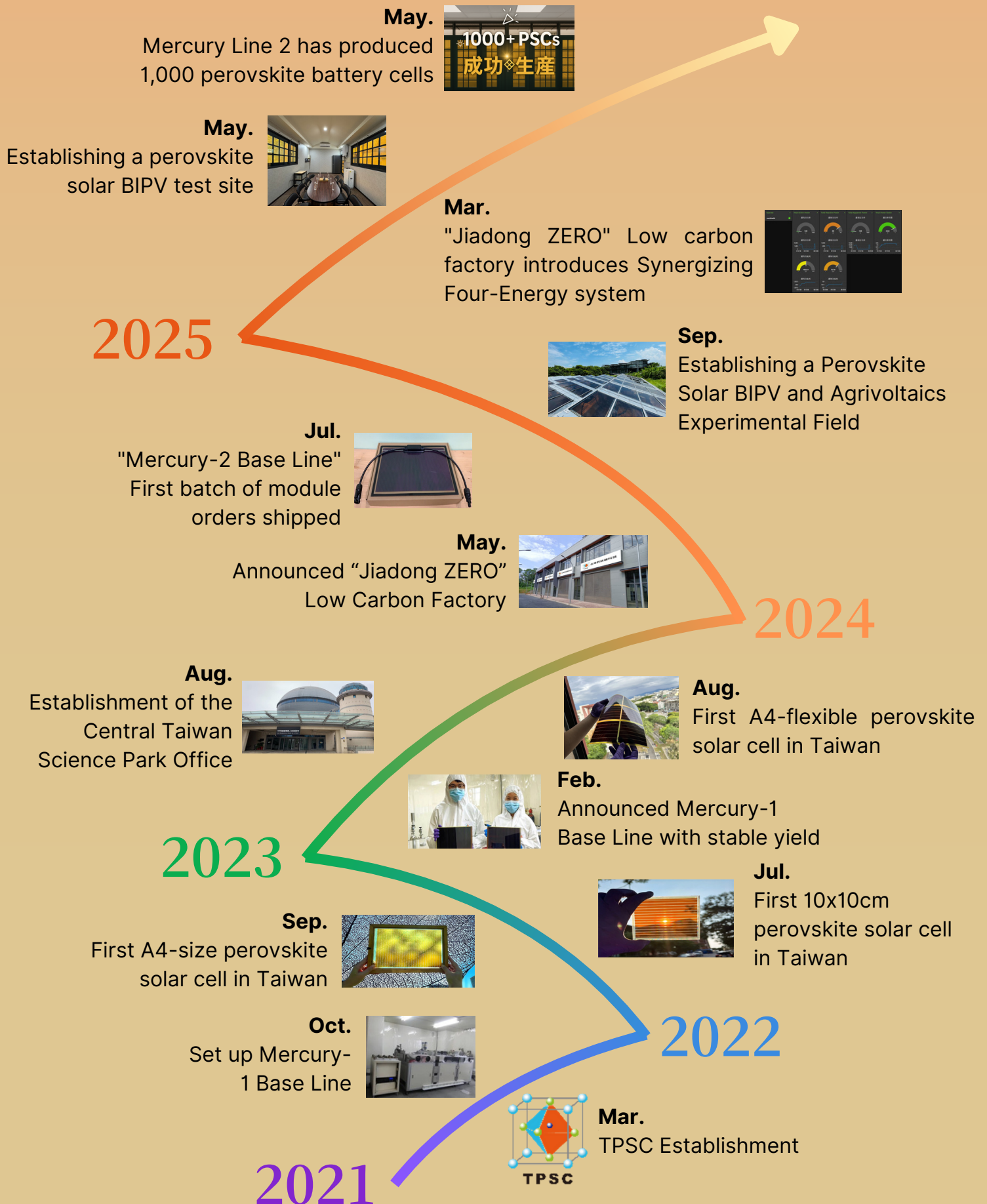
Process



Applications

Taiwan Perovskite Solar Corp. (TPSC) is dedicated to the specialized field of perovskite, providing integrated solutions and services for third-generation solar cells. As experts in perovskite solar cells, we offer comprehensive solutions that encompass materials, processes, equipment, and applications, delivering efficient and complete services to our clients. TPSC continues to leverage its rich R&D capabilities and experience towards a broader range of industrial applications, bringing leading advantages to our customers.

MILESTONE



AWARDS & HONORS

Awards



2025 AAN Global Startup Awards
SciTech Global Award



2024 SNEC Top 10 Highlights Selection
Gold Award



2024 IAPS Award



2024 KPMG Taiwan Tech Innovation
Top 5

Honors



Feb. 2024
Special Feature in
Japan Chemical Daily



Dec. 2024
Professor Tsutomu Miyasaka
visited TPSC headquarter

JIADONG ZERO LOW CARBON FACTORY

First Carbon Zero Perovskite Factory Design

Synergizing Four-Energy to achieve zero carbon

Power Generation



- Laying down perovskite solar cells

Energy Storage



- Increase the proportion of self-generated power in buildings
- Improve the stability of power supply
- Shift electricity usage to nighttime.



Energy Conservation



- ISO 50001 Energy Management System
- Advanced Process Facilities (APF) for industrial use
- Efficiency control of air conditioning and chilled water systems.

Artificial Intelligence



- Smart factory
- IoT smart grid



MERCURY LINE

Taiwan Perovskite Solar Corp. (TPSC) launched "Mercury Line" project in 2021, providing consumers with a comprehensive solution for perovskite solar energy, including materials, equipment, technology, and applications. The Mercury Line solution helps companies that have not yet ventured into third-generation solar manufacturing to rapidly acquire the capability to produce and develop perovskite solar cells at the fastest possible speed.

In 2022, TPSC introduced the "Mercury Line 1," successfully producing the first A4-sized perovskite solar cell in Taiwan. In 2024, we surpassed previous achievements by unveiling the "Mercury Line II," comprehensively enhancing efficiency and product quality for perovskite production line. In May 2025, Mercury Line 2 successfully produced the 1,000th perovskite battery cell, symbolizing the stability of the process and the feasibility of further capacity expansion.



Mercury Line II

Perovskite Production and R&D Platform

The launch of the Mercury Line assists companies in revitalizing existing plant assets by creating a verification platform that integrates perovskite with various materials. This allows business owners to seize the opportunity to ride the renewable energy wave and embrace the net-zero carbon emission business prospects in an era where environmental sustainability is a common topic of discussion.

EQUIPMENT OF MERCURY LINE



Cleaner



Oven



Sputter



Hot Plate



**NSTFRc
Machine**



Glove Box



Solar Simulator

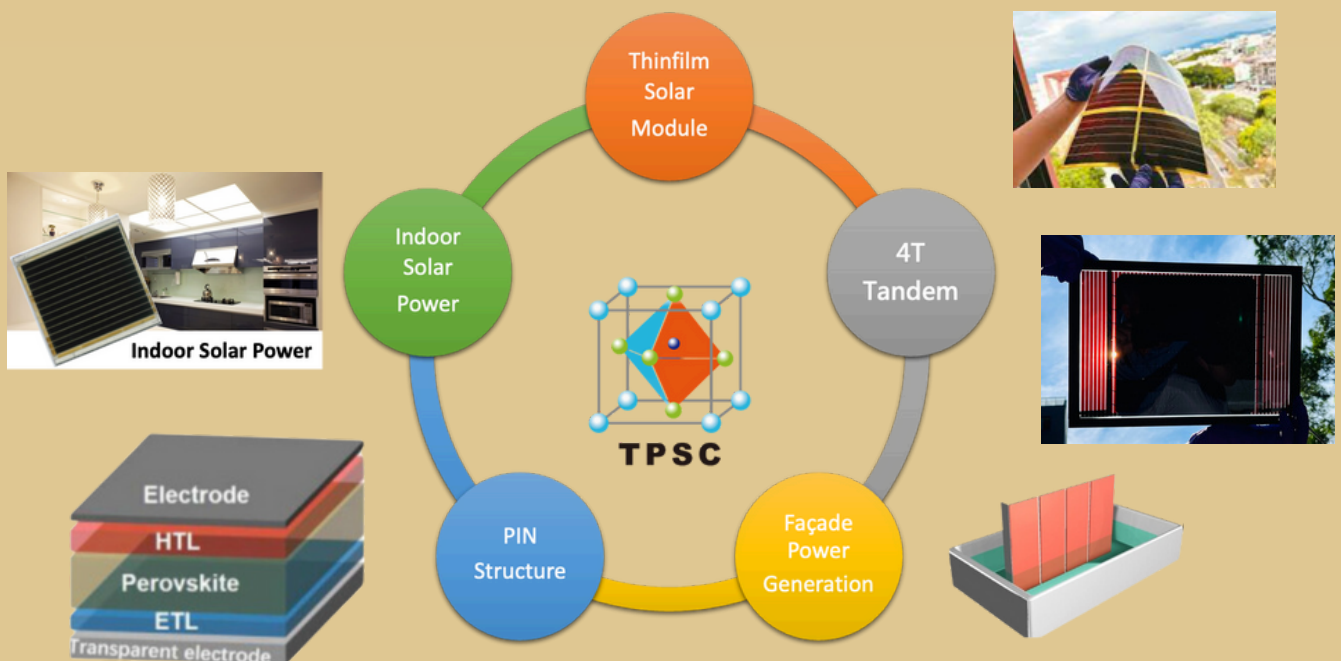


Laser



Coater

MERCURY LINE II PEROVSKITE SOLAR RESEARCH PLATFORM



INDUSTRY APPLICATIONS

Luban Series Carbon Zero Buildings



Building-
integrated
photovoltaics
(BIPV)



Gaia Series Perovskite Solar Greenhouse

Agrivoltaics

Indoor Light-
electricity

Vehicle-
integrated
photovoltaics
(VIPV)



Pegasus Series Low Carbon Transportation



Self-powered
E-paper table card

FIELD VALIDATION PLAN

1 GAIA Perovskite Solar Greenhouse

Experimental Crops: Cucumbers, Cherry Tomatoes, Strawberries, and others



2 TPSC Jiadong Headquarter

Building a zero-carbon smart factory based on perovskite solar cell technology, integrating four key capabilities: Power Generation, Energy Storage, Energy Conservation, and Artificial Intelligence.



3 Hsinchu F Park

Install perovskite floor-to-ceiling windows to take into account light transmission, power generation and heat insulation



4 Taichung Science Park

Install perovskite solar building materials to meet the power needs of indoor appliances.



5 International semiconductor

Semiconductor factory installs perovskite solar window to show its determination to reduce carbon emissions and save energy



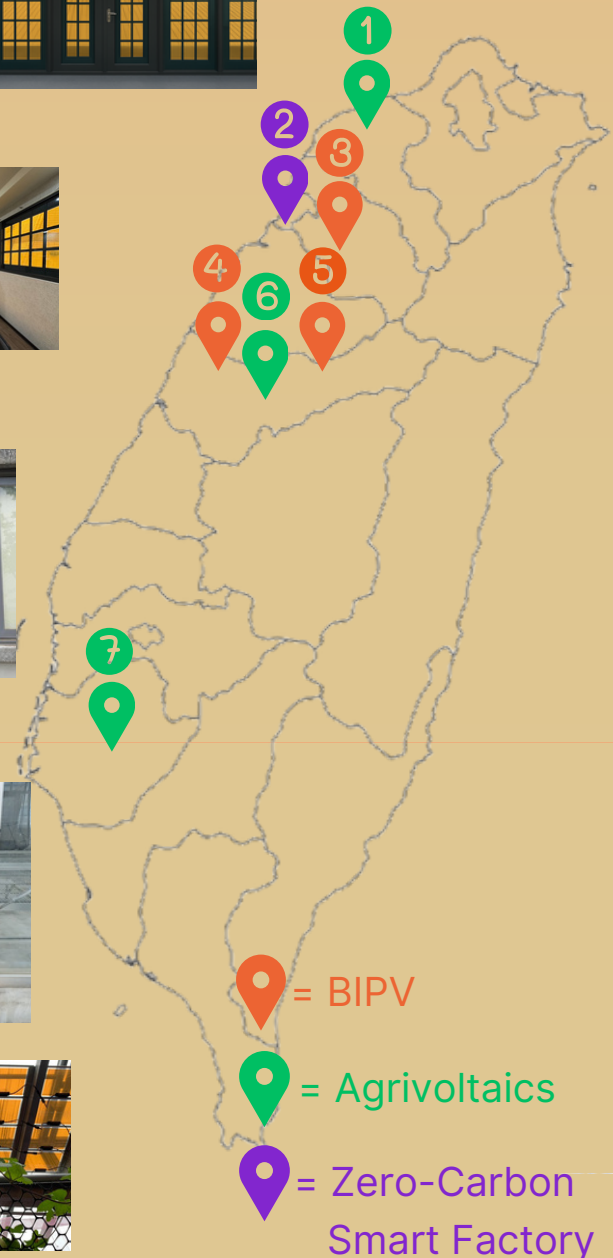
6 Agrivoltaics in National Chung Hsing University

Verification of Power Generation Efficiency in the Facade Area of Agricultural PV Greenhouses



7 Agrivoltaics in Tainan City

Experimental Crops: Hops, Coffee Beans



NEW STANDARDS FOR FUTURE BUILDINGS



Transparency Thin-film solar tech



Facade power
generation



Color adjustable



Thermal insulation



Waterproof



Wind resistance



Noise reduction

Windows ZERO
Perovskite Solar Window



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Taiwan Perovskite Solar Corp.



Artificer
Intelligence
Zero emission
風光淨零



PRODUCT DEVELOPMENT

TRACK Perovskite Building Materials

May 2025

Hsinchu F Park – **Perovskite floor-to-ceiling windows** were successfully launched.
Size: 15 square meters



May 2025

Taichung Science Park – **Perovskite Smart House**
The first perovskite BIPV site was opened to the public.
Size: 8.5 square meters



Mar. 2025

Taiwan's first perovskite solar window was installed, with a size exceeding meter level.
Size: 2.1 square meters



Oct. 2024

Perovskite solar door – The number of battery cells and the area were further enlarged, and the issue of door and window shaft routing was overcome.
Size: 1.8 square meters



Aug. 2024

Perovskite lattice window—improving packaging technology and improving circuit design.
Size: 0.44 square meters



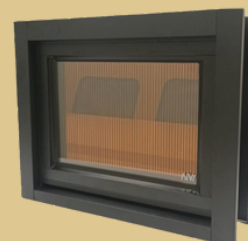
Jun. 2024

Perovskite solar window integrated with **PDLC** smart dimming film.



Oct. 2023

Perovskite solar window prototype successfully developed.
Size: 0.12 square meters



FOUR TAIWAN FIRSTS,

Redefining the Standard for Smart Buildings

Largest Building-Integrated Application Area

Measuring 7.5 meters wide and 2 meters high, with a total area of 15 square meters, this project marks the largest known perovskite architectural application in Taiwan to date.



Pioneering Integrated Design

Combining perovskite photovoltaic modules with natural lighting and ventilation features, this system achieves a three-in-one solution—power generation, daylighting, and ventilation—designed to meet the multifunctional needs of buildings in subtropical regions.



Integration of Environmental Sensors and Visualized Energy Management

The system is connected to a real-time monitoring platform that integrates power generation data with solar irradiance, ambient temperature and humidity, and gas sensing, enabling intelligent and visualized energy management.

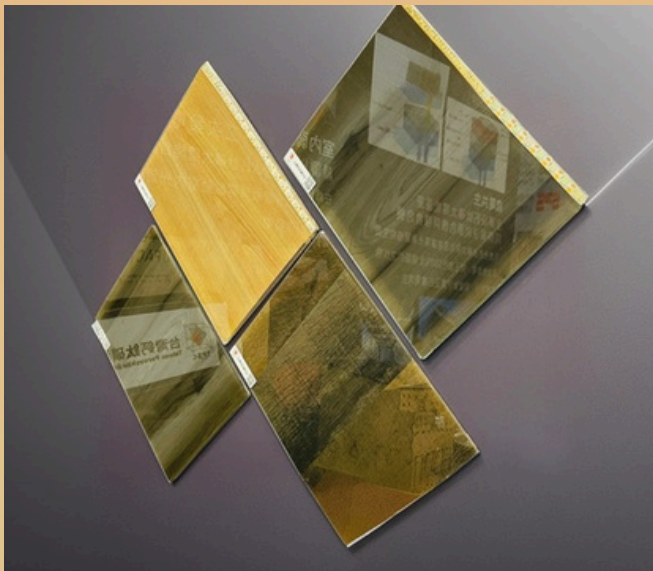


Fastest Installation Record

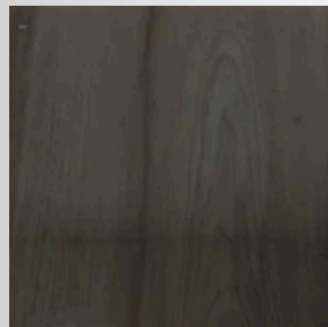
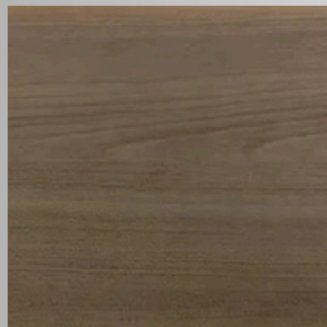
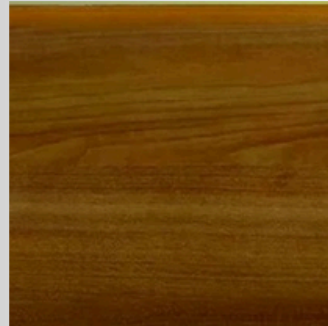
Thanks to a modular pre-assembled design, on-site installation was completed within 36 hours, demonstrating a high level of standardization and construction efficiency.



AESTHETIC PV BUILDING MATERIALS



At first glance, it looks like an ordinary wall tile, but in fact, this is "Aesthetic PV Building Materials" launched by TPSC. In the future, there's no need to worry about the limited color options when installing solar panels, nor the conflict with architectural aesthetics. With the homeowner's personality in mind, "Aesthetic PV Building Materials" allow your living space to stand out with style.



IOT SELF-POWERED APPLICATIONS



台灣鈣鈦礦科技

X



Perovskite Solar E-Paper Bike-Sharing Vehicle Solution



TPSC and E Ink Holdings have jointly developed a next-generation solar-powered bike-sharing vehicle solution, highlighting three main features: high photoelectric conversion efficiency, all-weather power generation, and low-power/high-performance color electronic paper displays. Perovskite solar cells have the characteristic of generating power in all weather conditions, producing electricity from dawn to dusk, regardless of sun or rain.

Perovskite Solar IoT Smart House

TPSC and Everbiz Industrial Co., Ltd. have jointly launched an IoT smart house powered by perovskite solar energy. The electricity generated by perovskite solar cells is used to drive environmental sensing devices for PM2.5, carbon dioxide concentration, light, and smoke, creating a zero-carbon factory and home environment for users.

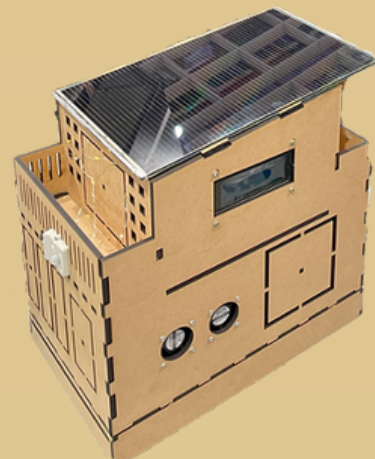


台灣鈣鈦礦科技

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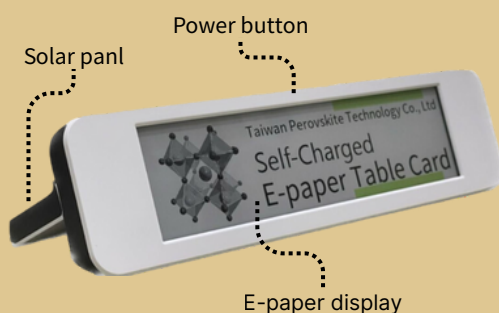


www.everbiz.com.tw



台灣鈣鈦礦科技

Self-Charged E-paper Table Card



Self-Charged E-paper Table Card is a device that integrates display, power saving and communication modules. It uses a built-in solar module to absorb indoor light and generate electricity, providing power to drive e-paper content display and communication transmission.

GAIA SERIES-AGRIVOLTAICS

GAIA III - Perovskite Solar Greenhouse



Potential Revenue Generated By Solar Greenhouse



Photovoltaic Income

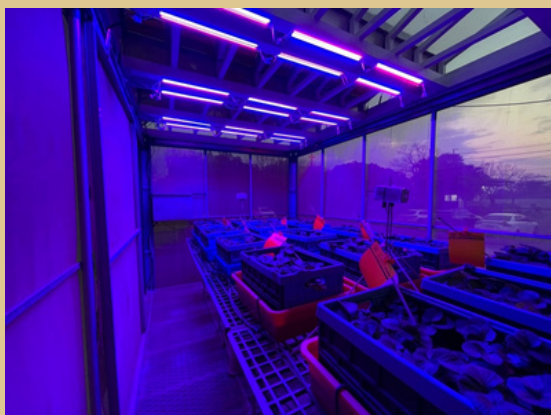
Installing Perovskite Solar Cells on the Roof to Generate Electricity Sales Revenue

Agricultural Income

Income from crops protected under the greenhouse is less susceptible to wind damage and pests, resulting in higher revenue compared to traditional ground-level cultivation. Implementing smart farming allows for real-time monitoring of crop conditions, preventing potential harm.

Carbon Sink Income

In the future, when the government includes agricultural carbon sinks in carbon rights trading, it is expected to create carbon sink income



Use the electricity generated during the day to power supplemental LED lighting at night, enhancing crop growth speed.

AGRIVOLTAICS

CROP GROWTH EXPERIMENT

A.Cultivating crops with low light requirements: Water spinach Green Gem lettuce / Butterhead lettuce

Through experiments, crops with low light requirements were found to grow well under perovskite solar greenhouses.

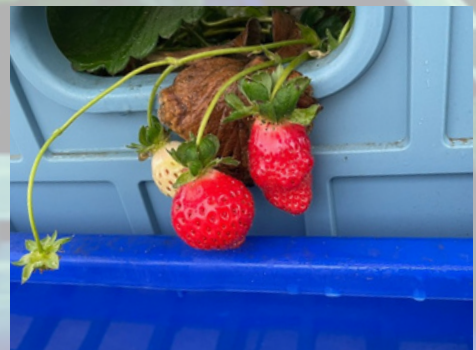


Lettuce Grown in Gaia Perovskite Solar Greenhouse

B.Cultivating crops with high light requirements: Strawberry, Cherry tomatoes & Cucumbers

Strawberry & Cherry tomatoes, being fruit-bearing plants, have been experimentally observed to exhibit leaf growth, fruiting, and ripening under perovskite solar greenhouses.

When there is insufficient light, cucumbers will stop growing, resulting in a decrease in yield



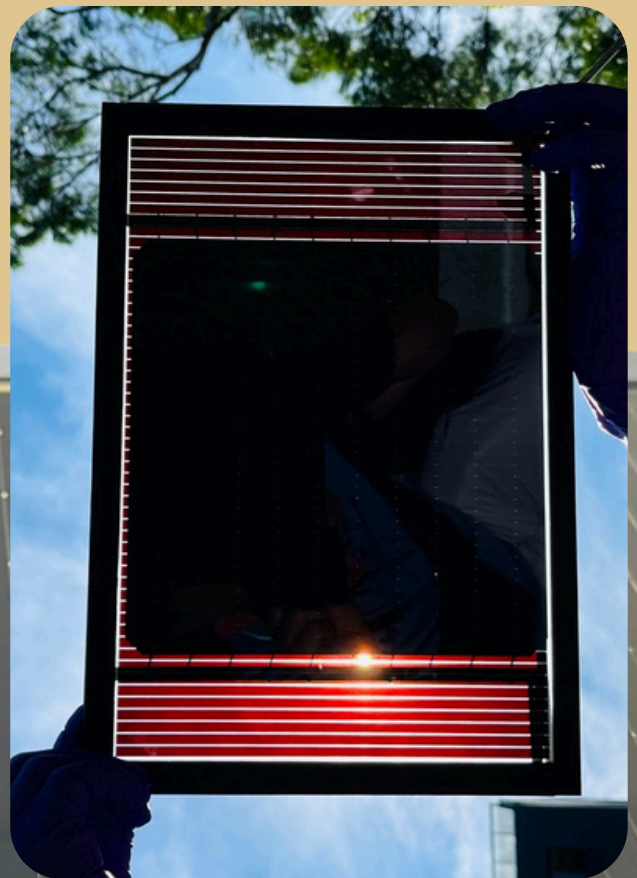
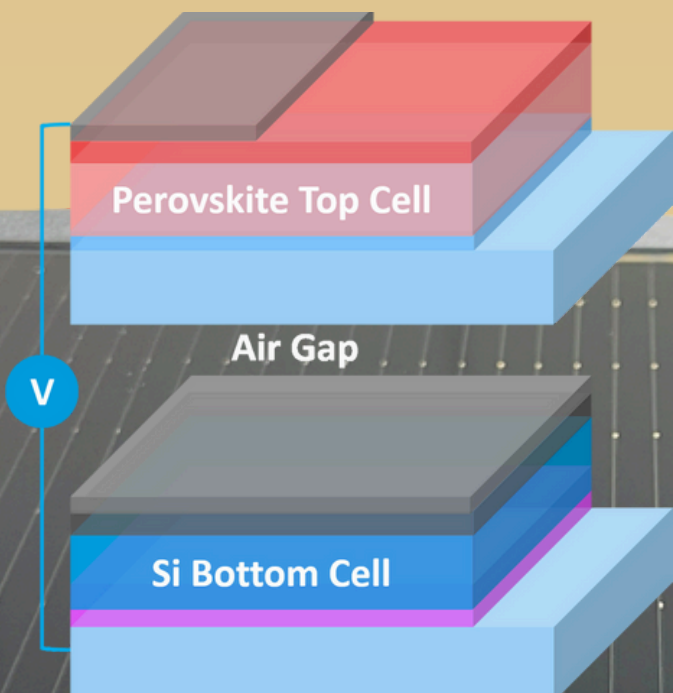
Crops Grown in Gaia Perovskite Solar Greenhouse
(Strawberry, Cherry tomatoes/Cucumber)

PEROVSKITE-SILICON TANDEM SOLAR CELL

When perovskite solar cells are stacked with silicon solar wafers, the conversion efficiency per unit area can be greatly maximized. This tandem structure allows each material layer to focus on the optimal range of the light spectrum it absorbs, thereby enhancing overall performance. It shows tremendous potential in the future solar energy market!

The tandem solar technology combines the light-transmitting properties of perovskite materials with the mature technology of silicon cells. This technology can be widely applied in building rooftops, electric vehicle roof, solar power plants, and other areas requiring high-efficiency energy solutions, offering more possibilities for Taiwan's energy transition.

4T Tandem



TENLIFE BUSINESS GROUP



DigiZerocarbon Corp. is committed to becoming the fifth cloud of enterprises, assisting enterprises in identifying and managing risks related to future energy supply, implementing energy audits, measuring and monitoring energy use, integrating and analyzing data, establishing information systems, and improving overall performance. It is also dedicated to improving overall performance with the goal of achieving net zero emissions.



钛曜新能源

Titanlumos-energy is dedicated to providing customers with outstanding perovskite solar energy solutions, covering a wide range of areas, including equipment and process transfer, building-integrated photovoltaics, vehicle-integrated photovoltaics, agrivoltaics, as well as self-powered IoT products. We take our customers' goals as our mission, approaching every project with professionalism and working hand in hand with our clients to create win-win outcomes!



Green Life Technology Corp. was founded in May 2019, with a focus on the green plastics field, developing technologies and applications for biomass/biodegradable plastics. Through the establishment of an industrial ecosystem platform, the company aims to connect R&D, manufacturing, and distribution forces to target high-end application markets. It also integrates technological and industrial resources to develop new materials and promote digitalization of the traditional plastics industry.



TENLIFE BUSINESS GROUP



According to United Nations statistics, the annual carbon dioxide emissions from the construction and building sector account for 38% of the global total. Reducing carbon emissions in buildings is imperative. AIZ targets the green building market, combining green awareness and products for a sustainable environment. We introduce innovative power-generating building materials that integrate features such as energy creation, heat insulation, noise reduction, and wind and water resistance, creating the most pleasant and healthy micro-environment for customers.



As a provider of digital Agro-Photovoltaics solutions, GaiaRight is committed to providing customers with environmentally friendly and efficient energy solutions. The design of perovskite solar panels not only considers the efficient use of energy but also emphasizes environmental protection. Our technology helps reduce carbon emissions and improves energy self-sufficiency.



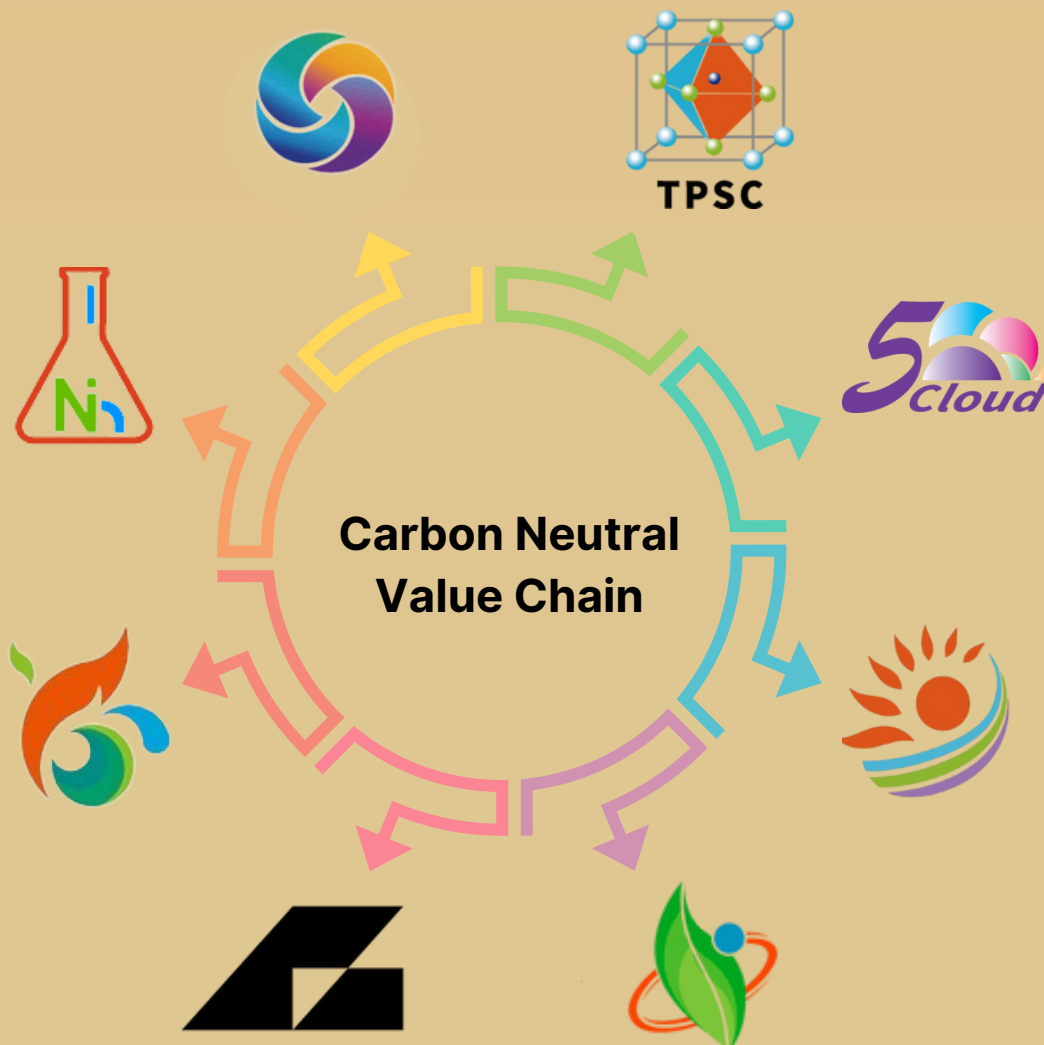
Nanohesive Advanced Technology focuses on developing third-generation perovskite solar cell materials, which differ from previous solar cell materials by incorporating "organic compounds" and "nanotechnology." The innovative technologies developed by Nanohesive are applied in the fields of solar cells, textiles, etc., providing customers with low-cost, high-efficiency, and environmentally friendly metal solutions.



TENLIFE BUSINESS GROUP



EcoCloud ESG CORP. Sustainability is committed to the mission of "dual-axis transformation as the foundation, rigorous transmission of sustainability knowledge." This mission involves deepening the sustainable talent cultivation system, creating paths for technological innovation, steadily developing elite training programs, and building opportunities for digital transformation.



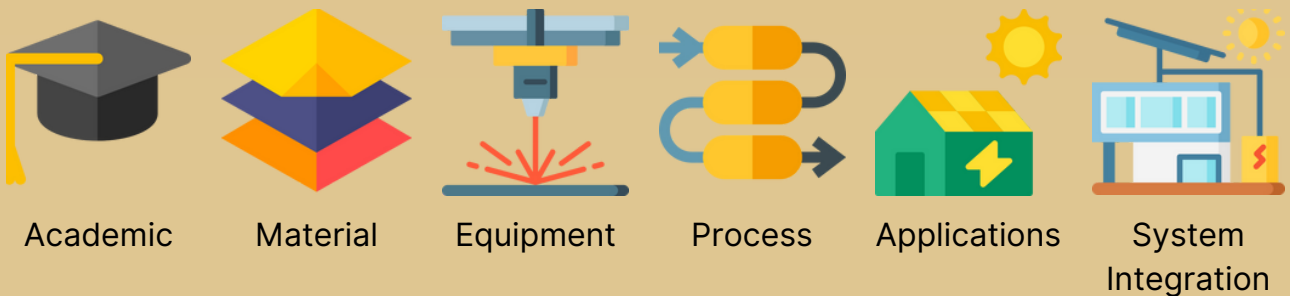


Introduction

To achieve the carbon neutrality goal by 2050, energy issues have become one of the important tasks for development in various countries, solar power is one of the key components of renewable energy. Perovskite solar cells are considered the new star of the next generation solar industry due to the advantages such as transparency, flexibility, tandem with Si-cells, indoor light power generation, higher efficiency and lower cost.

Currently, many countries worldwide have invested heavily in the perovskite solar industry. Taiwan has excellent R&D technology and equipment manufacturing capabilities. Taiwan Perovskite Research and Industry Association is committed to integrating materials, technology, equipment, and application resources to accelerate the development of the industry and maintain competitive advantage for third-generation solar industry in Taiwan.

Membership Categories





Annual Events



Aug.

5th Taiwan Perovskite Technology and Application Forum



Jun.

2025 SNEC PV power Expo



Feb.

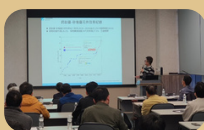
2025 World Smart Energy Week @Tokyo



May.

Expo 2025 Osaka - Perovskite Application Site Visit Tour

2025



Dec.

2nd Taiwan Perovskite Material & Supply Chain Forum



Aug.

4th Taiwan Perovskite Technology and Application Forum



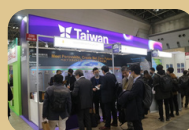
Oct.

2024 Energy Taiwan Expo



Jun.

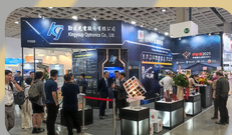
2024 SNEC PV power Expo



Feb.

2024 World Smart Energy Week @Tokyo

2024



Oct.

2023 Energy Taiwan Expo



Dec.

1st Taiwan Perovskite Material & Supply Chain Forum



Aug.

3rd Taiwan Perovskite Technology and Application Forum



May.

2023 SNEC PV Power Expo



May.

Established Taiwan Perovskite Research and Industry Association (TPRIA)

2023

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