Sunpal

NEW ENERGY • NEW MATERIAL

AGRI–PV & BIPV

one stop solution provider

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AGRI-PV System

Agriculture Combined Photovaltaics

The photovoltaic agricultural integrated grid-connected power generation project combines solar power generation, modern agricultural planting and breeding, and efficient facility agriculture. On the one hand, the solar photovoltaic system can use agricultural land to directly generate electricity at low cost. On the other hand, a major feature of double-glass modules is that they can be made translucent, and the main light sources needed for the growth of animals and plants can penetrate; in addition, infrared light can also penetrate, which can store heat energy and increase the temperature of the greenhouse, which is beneficial for plant and animal growth and energy conservation in winter. The project will benefit the most advanced technology, experience and talents in the fields of double-glass solar energy, system integration, intelligent control technology, facility agriculture, agricultural planting and other fields. With the double-glass solar facility agricultural integrated grid-connected power station as the core, it will serve as an integrated double-glass solar facility. High-tech agriculture integrating glass solar power generation, agricultural electronics engineering application and promotion, modern agricultural planting and breeding, processing and comprehensive utilization, agricultural planting and breeding technology exchange and promotion, talent training, tourism agriculture, LOHAS agriculture, agricultural product logistics and other functions Industry Base.

Overview of Agri-PV: general speaking, Agri-PV is a new type of agriculture that widely applies solar power generation to modern agricultural planting, breeding, irrigation, pest control, and agricultural machinery power supply.
Agri-PV complies with the biological chain relationship and the requirements of the best biological production raw material energy system, follows the production laws of agricultural products and innovates material and energy conversion technology to achieve the purpose of intelligent light supplementation, water replenishment and temperature regulation, and the agricultural products produced will be safer, more nutritious and more productive than those produced by existing methods.
The significance of Agri-PV compared with traditional agriculture, Agri-PV is a transformation of production methods that transforms farms into factories and fields into workshops.

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The advantages of photovoltaic agricultural greenhouses mainly include:

Effectively alleviate the contradiction between man and land and promote sustainable social and economic development: The photovoltaic agricultural greenhouse power generation module uses the roof of the agricultural greenhouse, does not occupy the ground, and does not change the nature of land use. Therefore, it can save land resources and can effectively reverse the situation of significant reduction of cultivated land to a positive effect.

Flexibly create an environment suitable for the growth of different crops: By setting up solar panels with different light transmittances on agricultural greenhouses, the lighting needs of different crops can be met. High value-added crops such as organic agricultural products and precious seedlings can be grown, and off-season planting , high-yielding and high-quality cultivation can also be achieved.

Meet agricultural electricity needs and generate power generation benefits: Using rooftop power generation can meet the electricity needs of agricultural greenhouses, such as temperature control, irrigation, lighting, etc. It can also be connected to the grid and sold to power grid companies to realize profits and generate benefits for investment companies.

Develop modern agriculture: Agri-PV projects can promote the integration of secondary and tertiary industries and are conducive to the development of modern agricultural projects. The development of modern agriculture and supporting agriculture is conducive to the integration of farming and can directly increase the economic income of local farmers.

Safety, environmental protection, and multi-function: Photovoltaic agricultural projects are characterized by safety, environmental protection, and multi-function, and meet the needs of future agricultural development. In summary, photovoltaic agricultural greenhouses can make full use of land resources and improve land utilization. At the same time, they can meet the lighting needs of different crops, achieve off-season planting and high-yield and high-quality planting, and can meet agricultural electricity needs, generate power generation benefits, and promote The development of modern agriculture improves farmers' living standards.

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BIPV System

Building Integrated Photovoltaics

It is a building-integrated photovoltaic power station system that integrates solar panels into building facades, roofs and other parts. As people's reliance on renewable energy increases and their awareness of environmental protection increases, more and more buildings will adopt BIPV technology.

1 Functions

BIPV has advantages that are incomparable to ordinary photovoltaics. In addition to its power generation function, BIPV can also be used as building exterior walls, awnings, awnings-skylights, etc. BIPV can provide green energy for buildings and improve the energy-saving effect of buildings. At the same time, it has a high degree of simplicity and beautiful structure, which can increase the value of the building.

2 Benefits

Energy saving and consumption reduction: The use of photovoltaic power generation can further reduce the power loss inside the building and reduce the building air conditioning load.

Sustainable development: The use of BIPV technology can provide clean, renewable energy for buildings, and photovoltaic modules have the characteristics of long life, no noise, and zero emissions.

Beautiful and elegant: Through integrated design, BIPV can fully consider the aesthetic effect of the entire building, making photovoltaic power generation an artistic element of the building.

Increase income: The excess electricity generated by BIPV system can be sold to the electricity grid to increase income.

3 How to install

BIPV needs to be designed in the early stages of building construction and matched with the building structure to achieve "harmony and unity between load and power supply and green landscape." Since BIPV is mainly used in parts such as facades and roofs, its installation needs to consider relevant construction engineering factors, such as geographical location, climate conditions, topography, and whether the winter sunshine time is sufficient. During installation, you can choose fixed frame or flexible frame. The specific method to be adopted depends on the specific situation and analysis before formulating an installation plan.

Of course, BIPV technology needs to consider the following details:

1 Design: In the design stage of the building, BIPV design and planning must be carried out to determine the location and angle of photovoltaic panel installation, including roofs, walls, canopies, etc. Integrate the exterior aesthetics of the building with BIPV technology to achieve an integrated effect that is beautiful, practical, and efficient.

2 Materials: In order to ensure the quality and life of the BIPV system, you need to choose high-quality products when purchasing solar panels and accessories to ensure their wind pressure resistance, waterproof function and easy maintenance.

3 Safety: The installation of BIPV technology should comply with international standards, and the installation of the electrical part must be completed by professionals to ensure its safety and reliability.

4 Maintenance: The BIPV system also requires regular maintenance, including cleaning the panel surface, checking the wires and monitoring the output power, and repairing faults in a timely manner to ensure the stable operation of the system.

5. Cost: BIPV system prices are higher than ordinary solar system, but the BIPV market is becoming increasingly mature. In the future, as the system matures and market demand increases, the system cost will gradually decrease.

To sum up, BIPV technology requires attention to detail in design, materials, safety, maintenance, etc. to ensure its reliability and effectiveness and provide buildings with long-lasting, efficient clean energy.

4 Future trends

BIPV technology has been widely used in many countries and regions, and its market size is expected to gradually expand in the future. With the advancement of science and technology, the improvement of solar panel performance, and the reduction of system costs, BIPV technology will be more widely used and become a major component of the digitization and intelligence of modern buildings, creating more beautiful and intelligent buildings for people. Comfortable and environmentally friendly built environment.

PRODCT FEATURES

SUN ROOM

That power generation and light transmittance combined is the biggest advantage in solar sunroom.

The double-glass solar roof is more power generation, long life; The light steel keel is structure is strong, light, low cost; short modular parts construction period,less labor cost; one-on-one on-demand customization.

Savings Cost Continued Revenue | **Installing Convenient Continued Revenue** | **Aesthetic Practical Design Scene Diversity** | **Green Environmental Helping Achieve Carbon Neutrality**

	Sunroom	PV Sun Room	Raytech Assembly PV Sunroom
Economic	—	★★	★★★
Functional	★	★★	★★★
Structure	★★	★	★★★
Beautiful	★★	★	★★★
Construction	★	★	★★★

Building photovoltaic integration

Using photovoltaic panels to replace traditional steel tile roof building materials, there is no need to replace the roof for 25 years. Compared with traditional steel tile roof, the cost is reduced by 20%-40%.

Perfect waterproof performance

The exclusive waterproof structure design has won a national patent. The water guide channel is installed with pressure blocks, which greatly improves the waterproof performance of the roof and eliminates hidden dangers of water seepage.

Modular installation

Dual structure arrangement, easy and fast installation and convenient maintenance, non-destructive slot-type installation between panels and the main sink, other components are installed in an interlocking manner to perfectly meet simple and fast installation requirements, both longitudinal and horizontal installation methods are applicable.

More reliable safety performance

High-level safety performance, product quality and safety performance have passed multiple tests and installation test certifications, and have outstanding performance in heat insulation, thermal insulation, waterproofing, and water seepage prevention.
The roof bearing pressure is as high as 0.7KN/m2 and can withstand Category 12 typhoons.

COOPERATION MODE

- Solar Panels Mounting Structure
- Project Full Materials
- Project Construction

VALUE-ADDED SERVICES

01
Approval Services
Provide construction qualification support to clients.

02
Technical Services Solution
Including design, product selection, material adaptation; provide customers with professional customized services.

03
On-Site Service
The team has 15 years of construction site management experience and provides customers with safe and worry-free on-site installation guidance services.

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APPLICATION SCENARIOS

Independent Sunroom

Raytech sunroom, bring you a low-carbon, energy-saving, comfortable quality living space, can easily use electricity and also enjoy the sunshine into the house, the sunshine into the yard.

Roof Shaped Sunroom

The system is applicable to all kinds of roof space, and the system matches the building to realize "Power generation on the roof and electricity consumption inside the house".

Semi-Closed Sunroom

Combining the top space of the building or courtyard with the sunroom system, the system adopts the working principle of converting light energy into electricity to realize "warmth in winter and coolness in summer" in the sunroom.

Gazebo-Style Sunroom

The system is both safe and stable as well as energy-saving and environmentally friendly, and can be equipped with charging devices to meet the charging needs of new energy vehicles.

Single-Side Full-Surface Sunroom

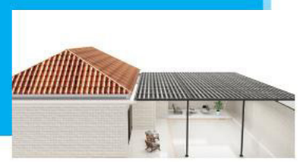
The system can be directly used as a roof, with stable structure and high waterproof, fireproof and mould-proof grade.

Double-Sided Full-Surface Covered Sunroom

Adopting solar power generation panels to make the whole roof and shed, which not only saves the cost of building materials, but also enjoys the income from power generation.

Terrace Sunroom

Making full use of the space in the courtyard, the patio courtyard is fully enclosed, which not only enlarges the effective use area of the courtyard, but also enriches the leisure function of the small courtyard.



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PRODUCT PROPAGANDA

图1-1

图1-2

Basic Model

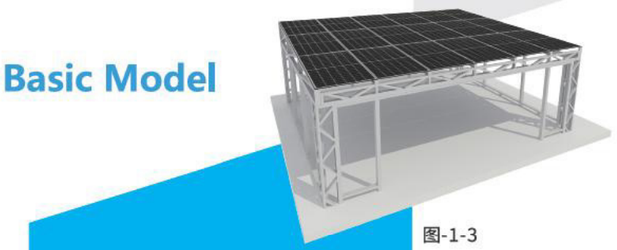

图-1-3

Light Luxury Model

图2-2

图2-1

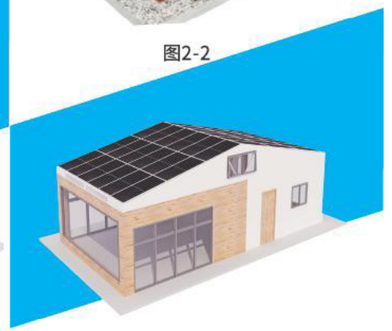

图2-3

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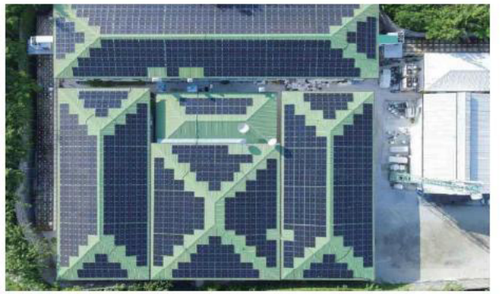
Making More Power

AgriPV in Walperswil, Switzerland

AgriPV in Walperswil, Switzerland

Maldives national resort distributed photovoltaic project



Maldives national resort distributed photovoltaic project

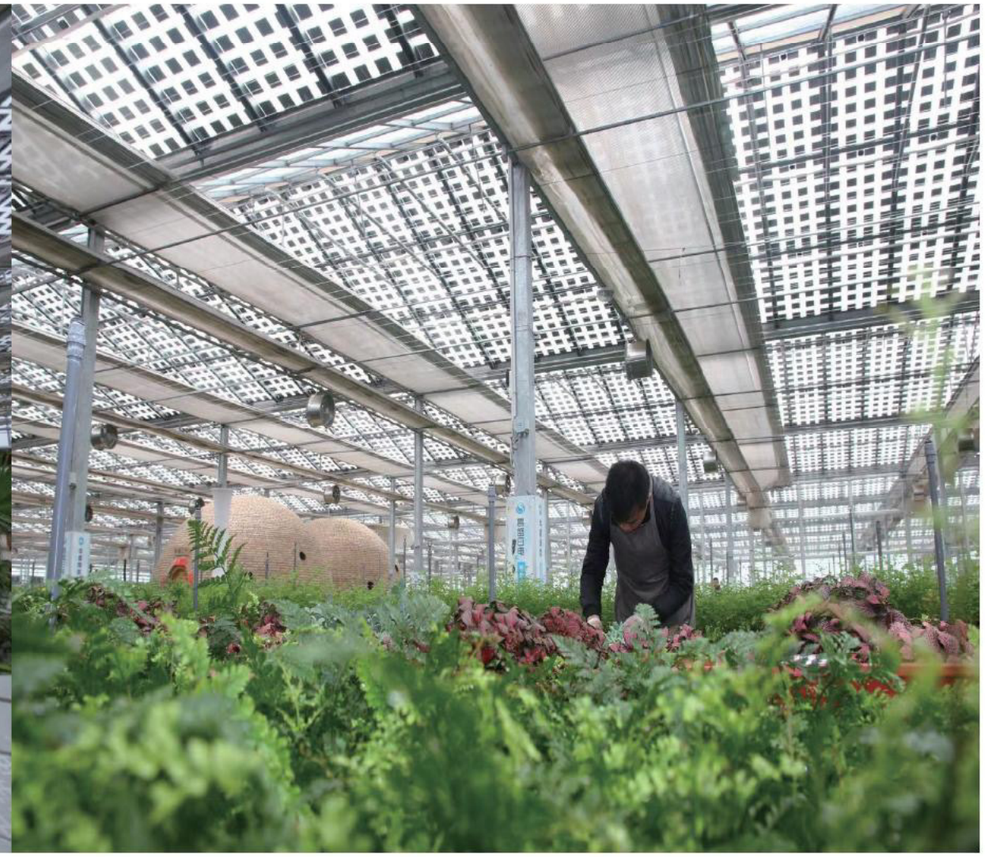
AgriPV in Conthey,Switherland
• Credit Photo: Insolight

AgriPV in Conthey,Switherland
• Credit Photo: Insolight

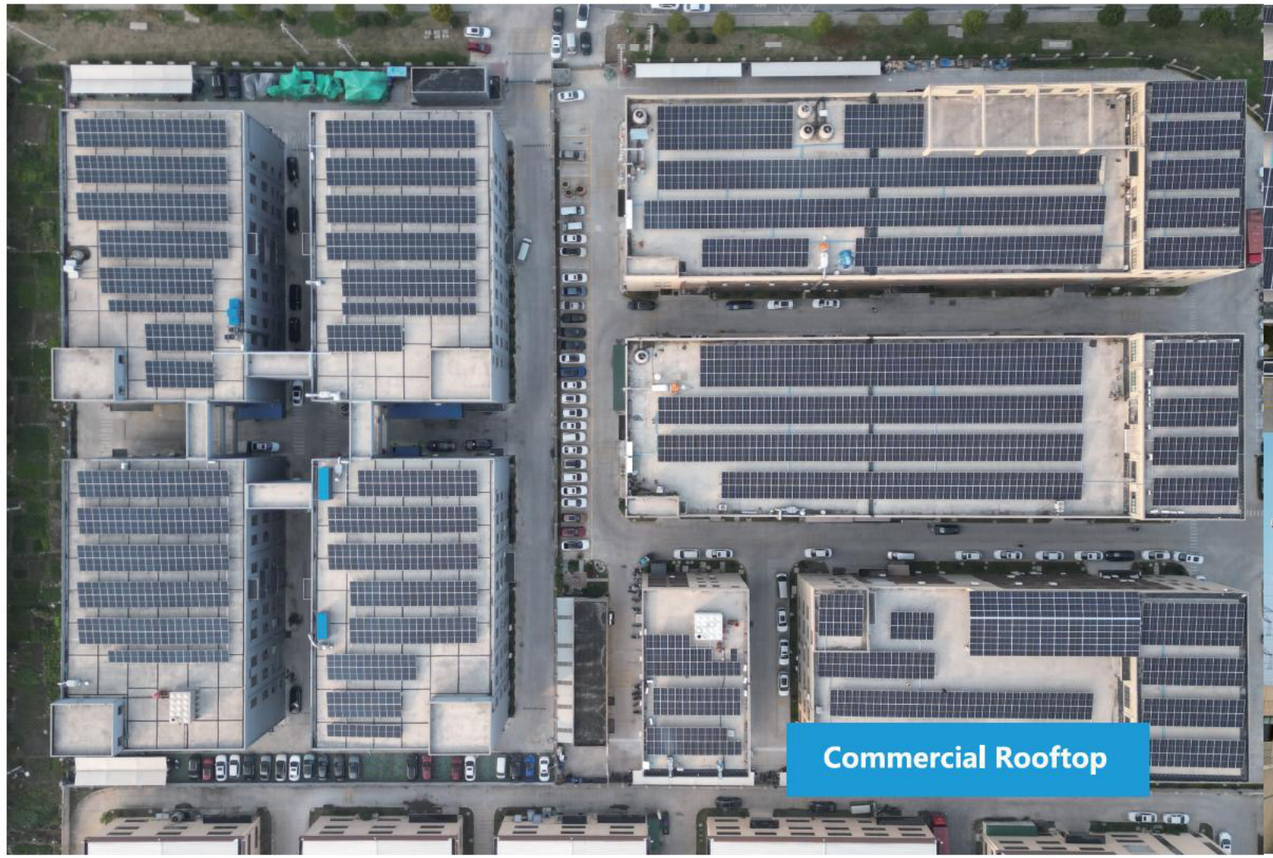
Volkswagen Ningbo Branch of Germany of the parking distributed photovoltaic project

Volkswagen Ningbo Branch of Germany of the parking distributed photovoltaic project

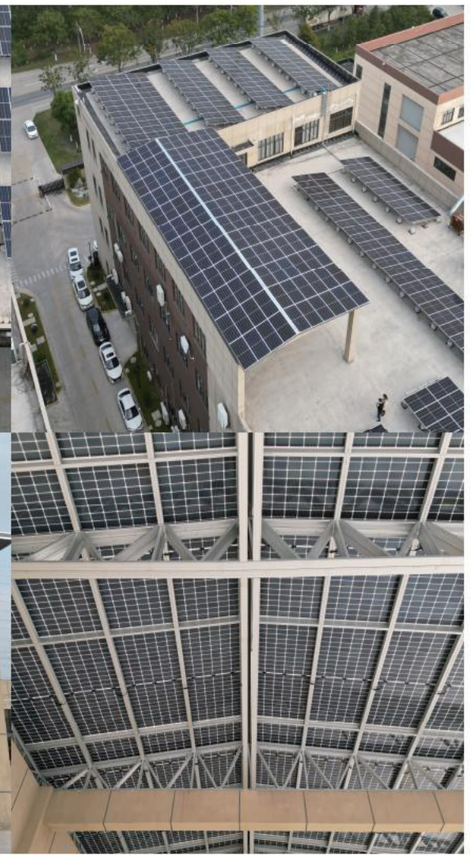
PV Greenhouse in Qingdao China



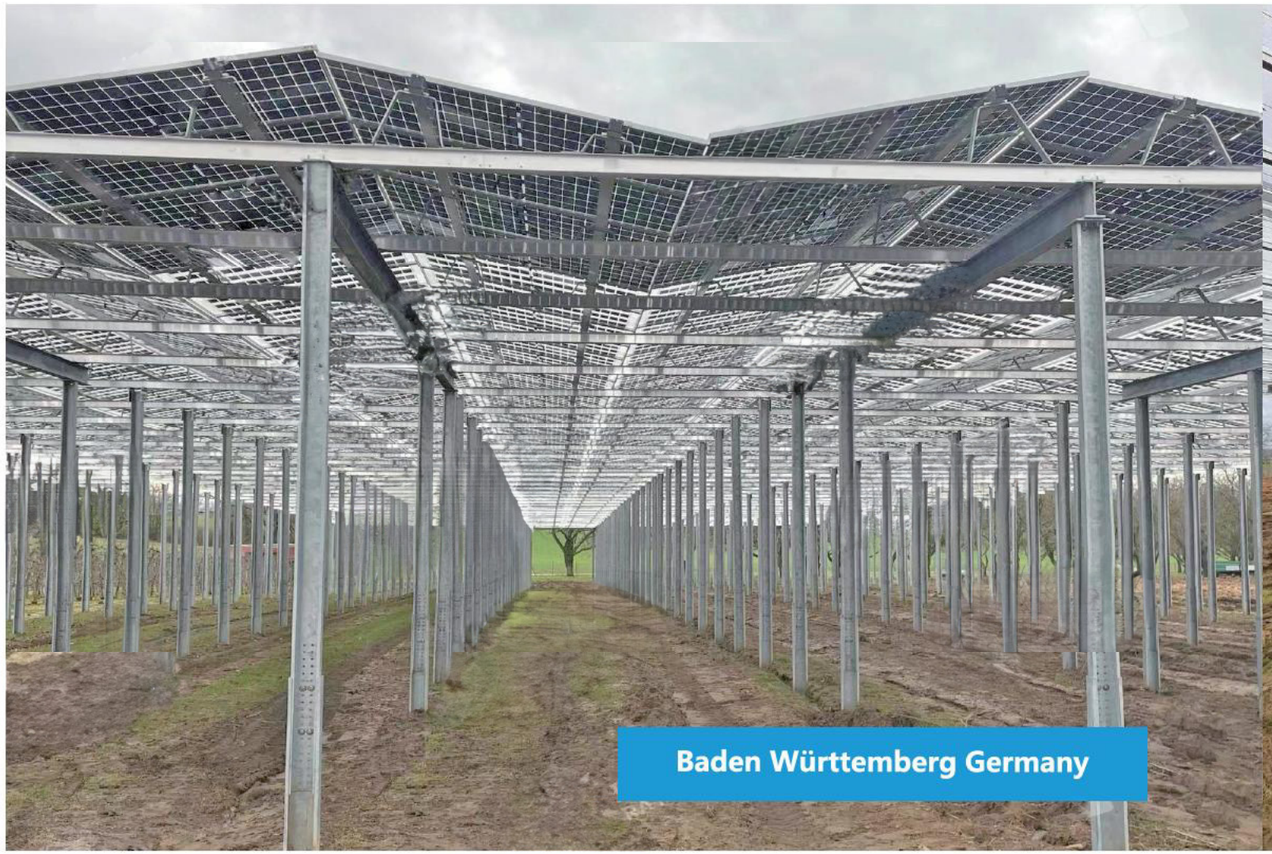
PV Greenhouse in Qingdao China



Commercial Rooftop



Commercial Rooftop



Baden Württemberg Germany

Lubera, EW Buchs, Insolight-PVgreenhouse, St Gallen, Switzerland

• Credit Photo: Insolight

Lubera, EW Buchs, Insolight-PVgreenhouse, St Gallen, Switzerland

• Credit Photo: Insolight

BIPV Project

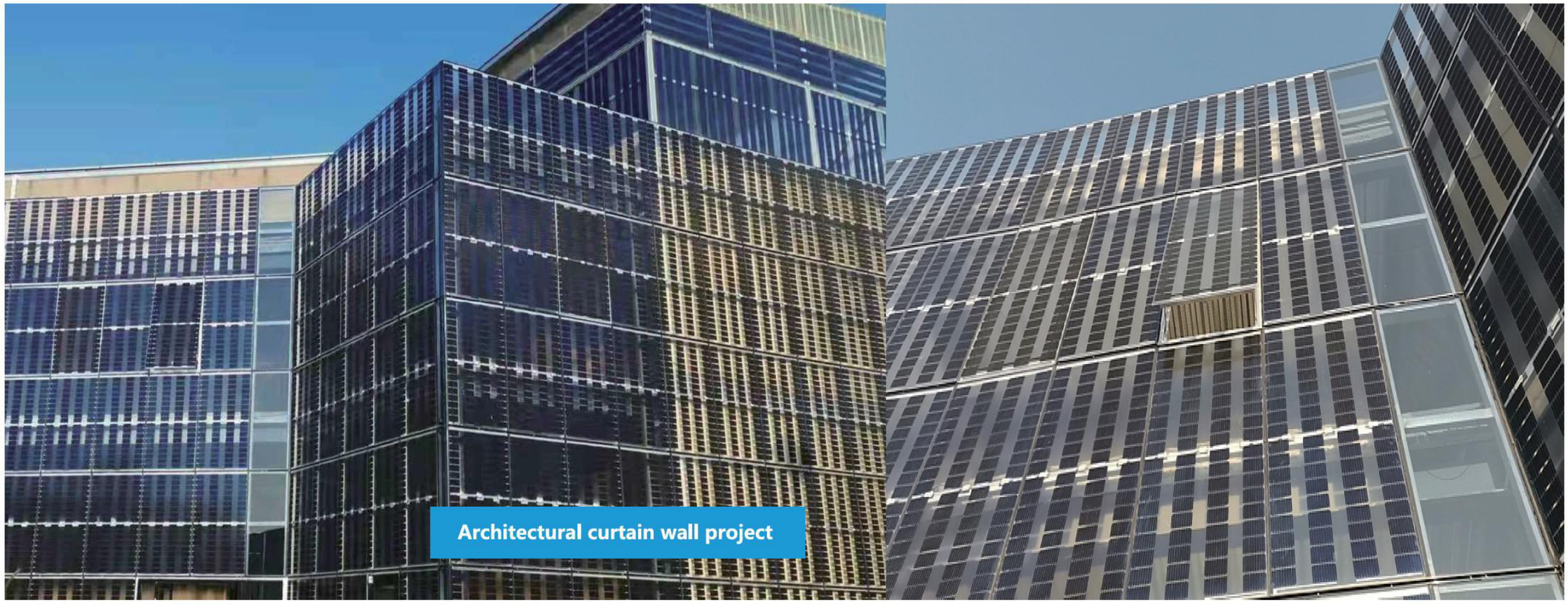
AgriPV Project in Yinchuan China

AgriPV Project in Yinchuan China

Qingdao Metro Line 6 Project

Courtyard solar sunroom in Weihai

Courtyard solar sunroom in Weihai

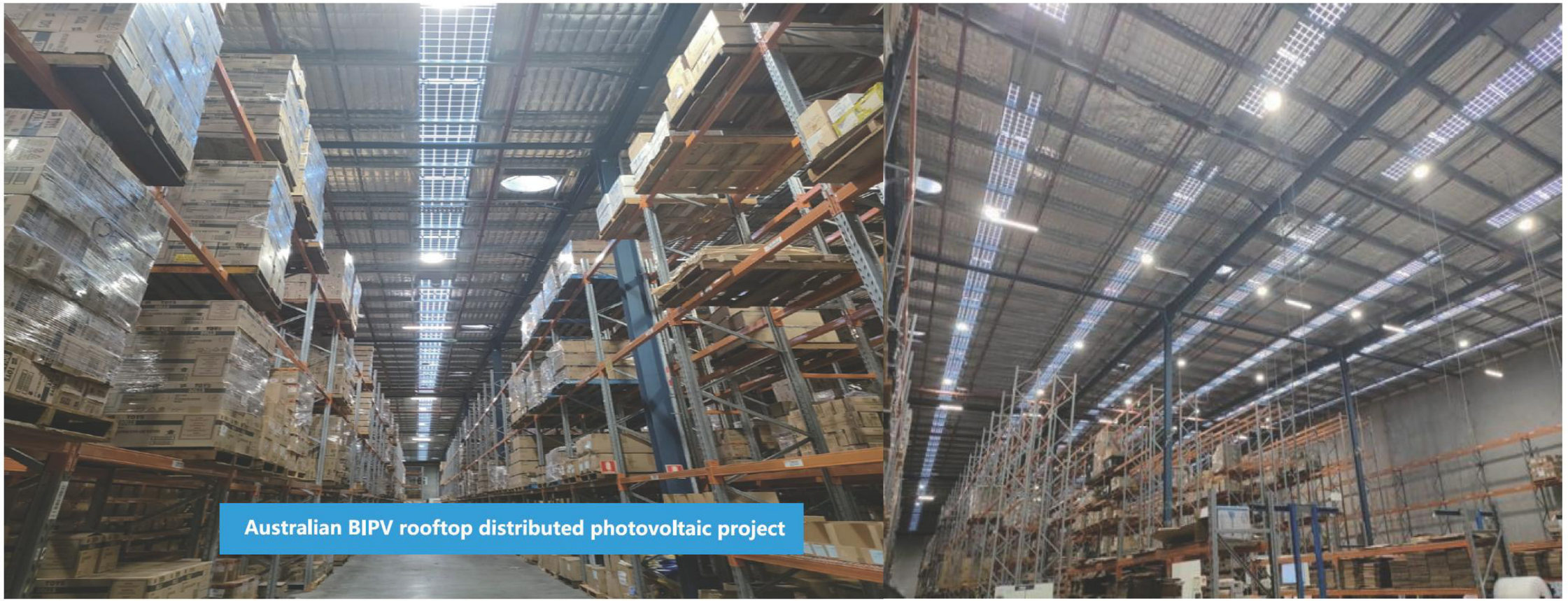


Architectural curtain wall project

BIPV Solar Fence in Austria

BIPV in SADER (Secretaría de Agricultura
Y desarrollo Rural) main building Mexico

BIPV in SADER (Secretaría de Agricultura
Y desarrollo Rural) main building Mexico

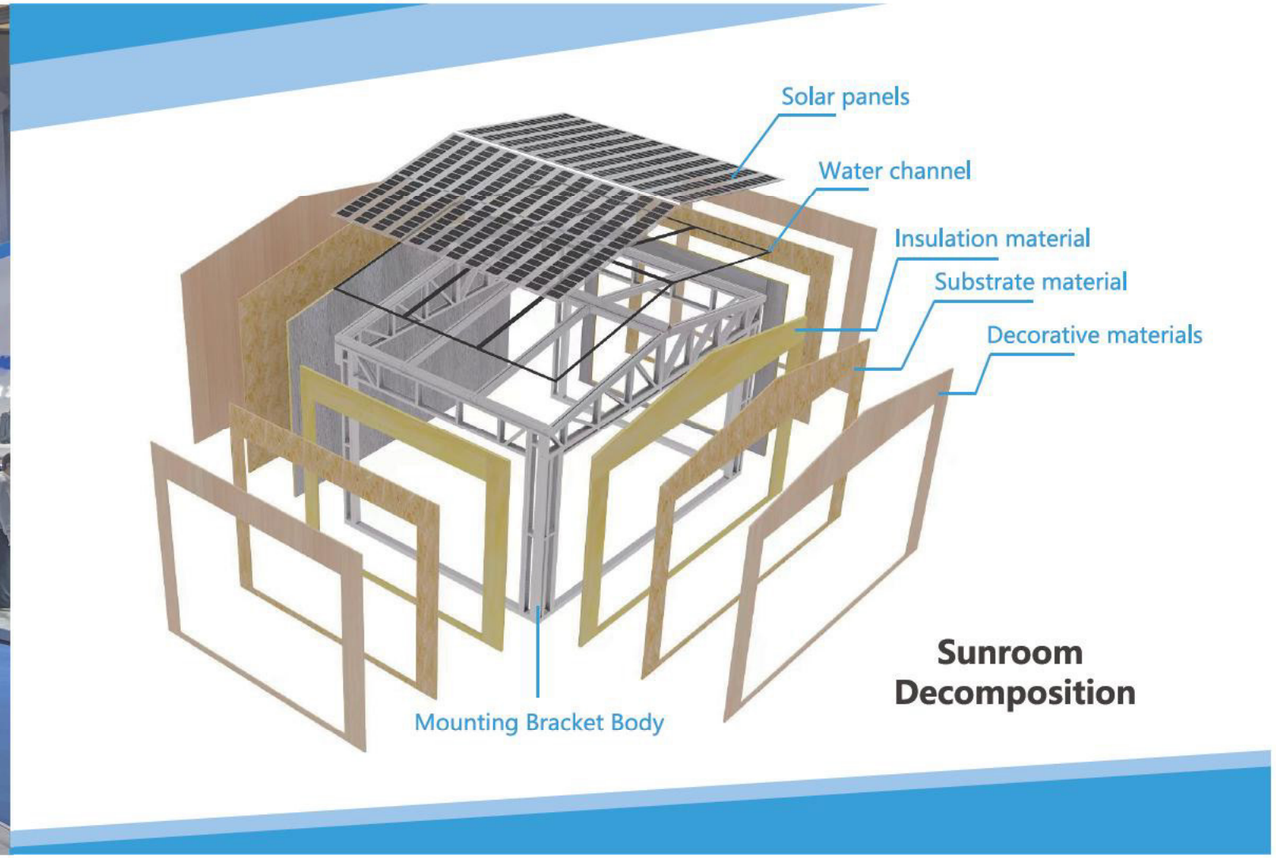


Australian BIPV rooftop distributed photovoltaic project

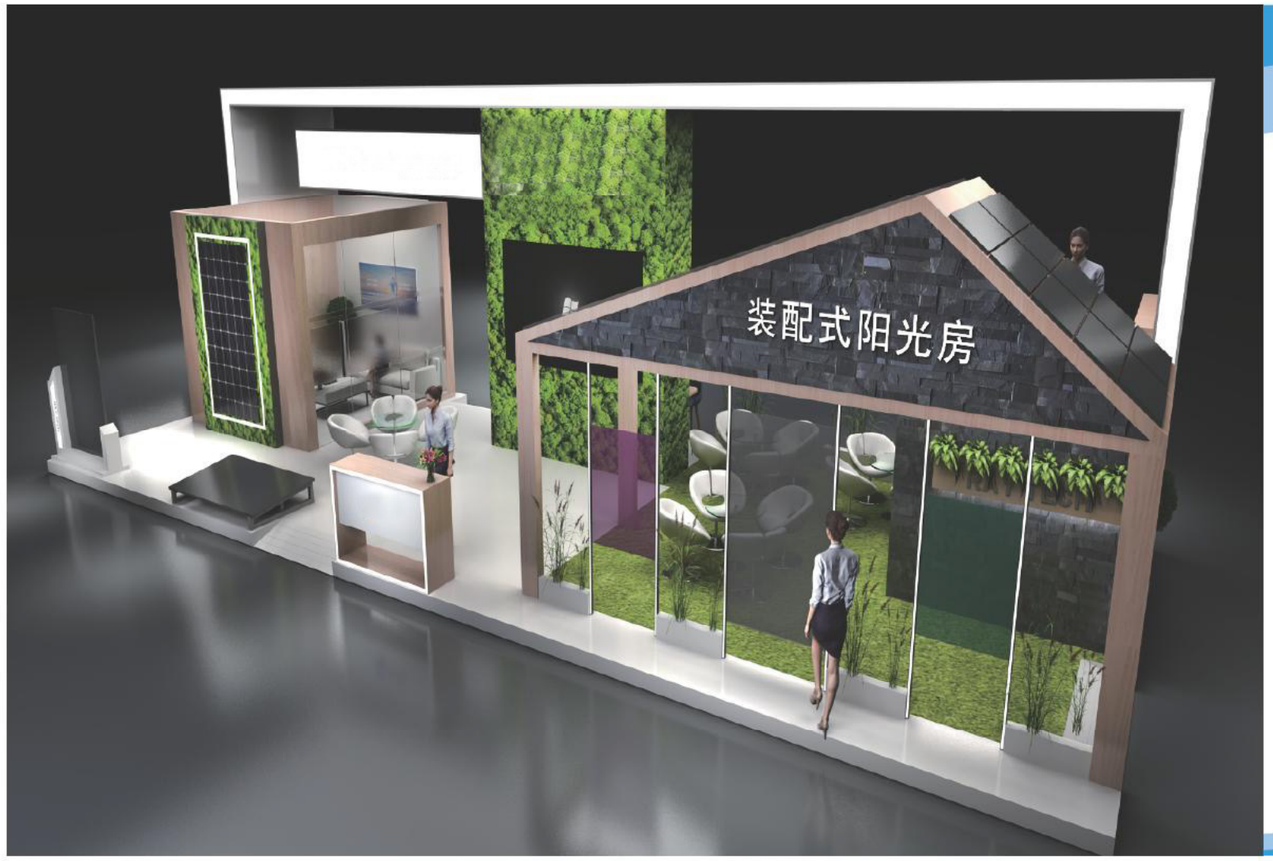
Australian BIPV rooftop distributed photovoltaic project

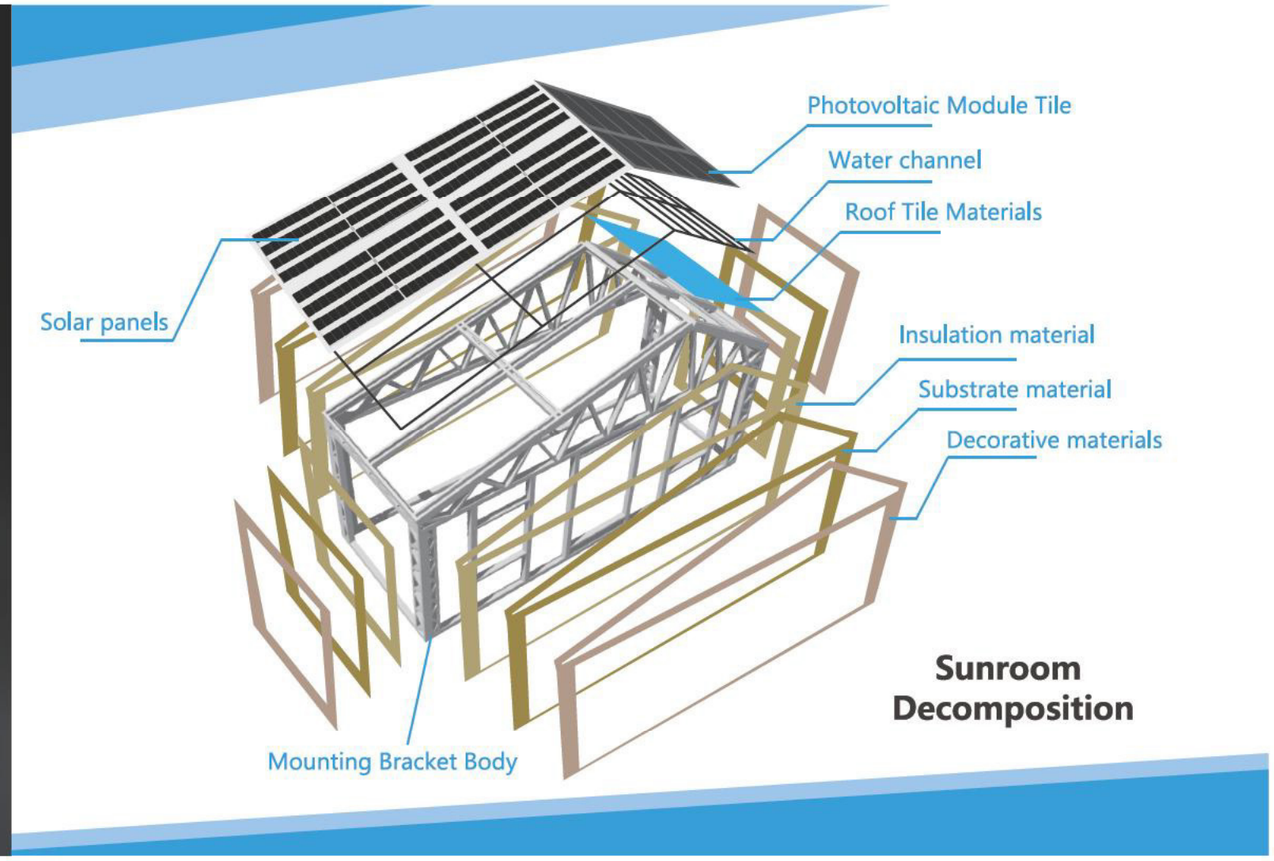
Beijing Jinhu Auto Ramp Lighting Roof

Beijing Jinhu Auto Ramp Lighting Roof



Sunroom Decomposition


装配式阳光房


Photovoltaic Module Tile
Water channel
Roof Tile Materials
Solar panels
Insulation material
Substrate material
Decorative materials
Mounting Bracket Body
Sunroom
Decomposition

Power Generation Equipment:

Adopting double-glass translucent solar panels (also known as power generation glass), it is a new type of power generation and energy-saving material that is revered for use in modern buildings.

Material Characteristics:

It meets the standards for the use of building roofs and curtain walls, and is low-carbon and environmentally friendly.

Applicable Space:

Building curtain wall, building roof sun room, courtyard pavilion and so on.

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