ADVANCED SOLAR POWER (HANGZHOU) INC.
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AOSP 龙焱能源科技 Aim high.Aim for future.

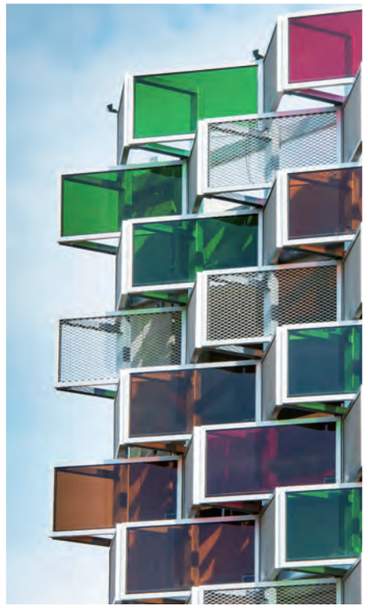
# ADVANCED SOLAR POWER

# Contents

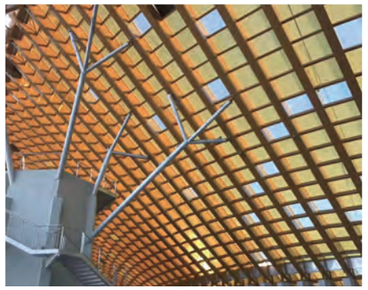


# 01
# Business Vision

Build a world-class PV enterprise.
Generate power for a brighter future.





# 02
# About us

## Business Profile

Advanced Solar Power (Hangzhou) Inc. (here in after referred to as "ASP") was founded in May 2008 by international photovoltaic expert Professor Wu Xuanzhi and others. Since the very beginning, ASP has never been off-track from its development strategy: Independent Innovation, Technology over scale. ASP is committed to take Cadmium-Telluride thin film solar cell technology from laboratory level to mass production stage in China with higher efficiency and much lower cost. The mission of ASP is to provide clean PV energy to the world with the lowest cost. ASP successfully broke the monopoly of foreign technology and become a company that can massively produce CdTe thin film PV module product. Our module efficiency has reached a excellence level at home and abroad.We have undertaken and completed a subject of the "863 Program (National High-tech R&D Program of China ) " and participated in the establishment of many iconic projects such as the China Pavilion of Expo 2019 and Future Energy Pavilion in Datong.

Currently, ASP does not only provides standard CdTe thin film solar modules with relatively high efficiency and stability to both domestic and foreign markets, but also offers the "turn-key" solutions on PV power station to its clients. The landscape of ASP business operations consists of 5 aspects: R&D for CdTe thin film solar cell technology, production-level equipment manufacturing, production line and technology bot, module p roduction and sales, and EPC for PV power station projects. With a joint-venture company founded in 2016, ASP also extended its business operations in investing and operating PV power stations.

ASP has a highly talented and well experienced R&D team that are consisted of the world top-tier scientists and graduates from multiple first-class universities of China. During the last ten years, ASP also built a three-tier system that consists of R&D on fundamental and core technology, R&D on production technology and international research cooperations. With this system, ASP can not only be capable of supporting transferring its proprietary CdTe technology to partners, but also take the technology further by incorporating the latest development of the CdTe PV technology in the world.

ASP is willing to further strengthen cooperations with partners who are interested in providing the most affordable PV power solutions to the world by using CdTe thin film solar cell technology. ASP believes that by working side by side, ASP and its partners can write a new chapter in PV production and application markets, and strive to build resource-saving and environmental-friendly societies worldwide.

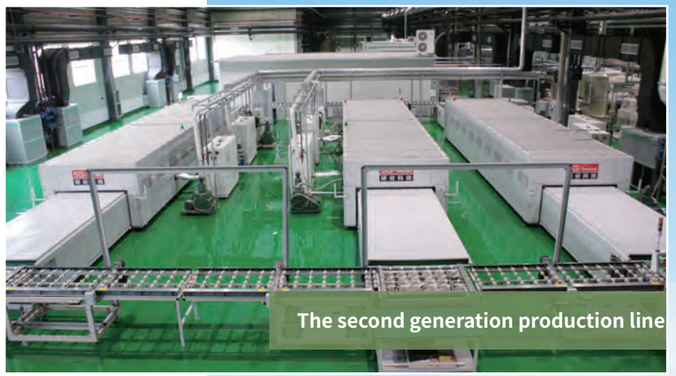



Strive for a resource-saving and environment-friendly society!

# Business Outlook

## ASP Production

The first generation production line



The second generation production line

Experimental line

### Production Line

ASP has a self-developed cadmium telluride thin film solar technology with completely independent intellectual property rights, and fully has the ability to industrialize cadmium telluride thin film solar energy.

# Business Outlook

Cai Qi, former vice governor of Zhejiang province and currently Secretary of the Beijing Municipal CPC Committee,visited

Dinghuan Shi, The State Council Counselor，visited

## Visitors from All Circles


Chuanzhi Liu, founder of Lenovo Group, visited

Minister of Science and Technology Sri Lanka visited

# Enterprise Honor


In June 2014, Awarded by the United Nations as "2014 Global Top Investment Scenarios to Apply New Technologies for Renewable Energy Utilization" Blue Sky Award


In October 2016,In the 16th China Photovoltaic Conference (CPVC16), Mr. Wu xuanzhi was awarded "China solar photovoltaic achievement award".

Formulated by the Ministry of Science and Technology,As the main undertaking unit of the "Research on Large-scale Production Technology and High performance of Cadmium Telluride Solar Cells" in the


In December 2016, ASP transmittance thin film module / BIPV module photovoltaic curtain wall and lighting roof won the 2016 national distributed photovoltaic application


In December 2017, ASP won the first domestic annual photovoltaic industry award "2017 Best Public Building Distributed Photovoltaic Project Gold Award"


In 2017,ASP won high-tech enterprise certificate


In August 2017, ASP was awarded "China Green Energy Contribution Enterprise "

The 2nd National Distributed PV Application Innovation Gold Award in 2017, Gold Award for Best Public Building Distributed Photovoltaic Project





# Product Quality Certification

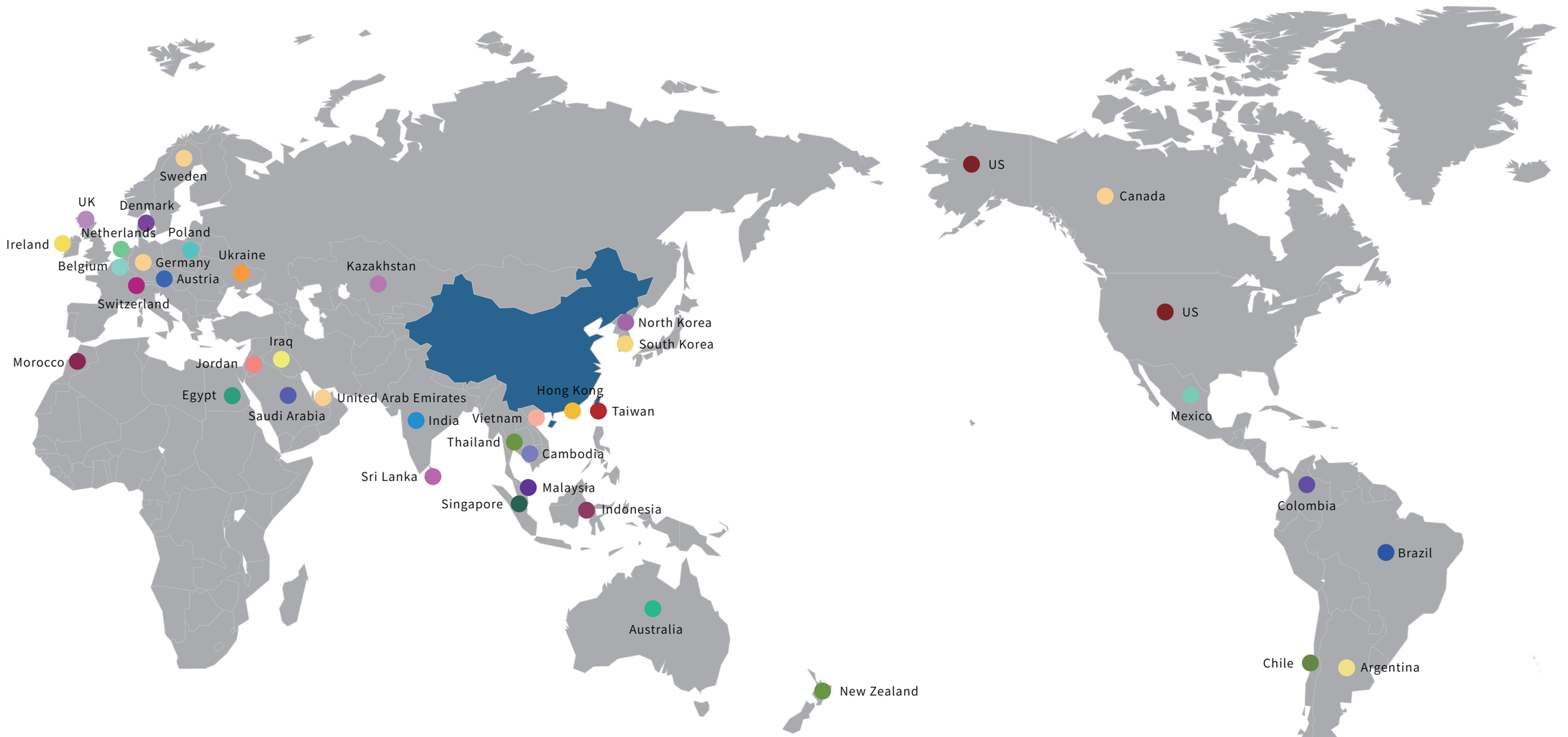
ASP's solar module products have received the most of major certification organizations across the world, including UL for United States, TUV for Europe,CQC for China,China Compulsory Certification, ISO9001, ISO14001...







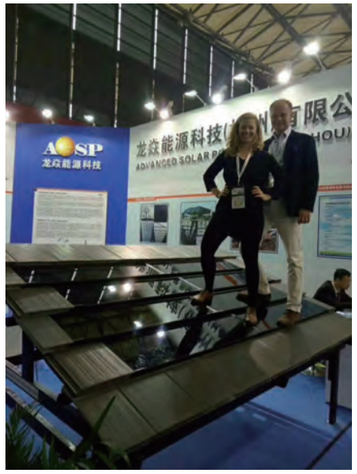

# Business Layout




The business covers all provinces, cities and regions except Macau.
Overseas projects are located in 39 countries and regions around the world.

## International Market Influence


The green bonds issued by Advanced SolTech, ASP's joint venture, were successfully traded on Nasdaq in Sweden.Congratulations were sent by Nasdaq headquarters at Time Square in New York city




ASP's PV Tiles at SNEC show


InterSolar Eu in Munich

The former Prime Minister of Egypt visited ASP's booth in Cairo.





## Development Path

**2008**

ASP was established on May 4th

**2009**

The first experimental line was built

**2010**

Complete pilot production line; ASP built its own factory of 21,000 $m^2$

**2011**

Built China's first fully automatic cadmium telluride module production line with completely independent intellectual property rights.

The efficiency of 3"x3" module reached 12.5% which was tested by NREL. It was the first time that a Chinese PV manufacturer had been listed in the PIP table.(Version 37, 2011).

**2012**

Passed the ISO9001 system certification and the TUV certification.

**2013**

Start marketing

The efficiency of 1200x600mm module achieved 12.05%. Got UL and CQC certification

**2014**

In the global market, ASP has gradually established the industry pioneer position of integrated photovoltaic application.

ASP was awarded the "2014 Global Top Investment Scenarios to Apply New Technologies for Renewable Energy Utilization" Blue Sky Award

**2015**

Undertook the 863 projects

ASRE was established

**2016**

Shenzhen SEG Advanced Solar Power was established.

Won the BIPV Building Component Gold Award;Chairman Wuxuanzhi won the China Solar Photovoltaic Achievement Award.

**2017**

The efficiency of the small size cell reached 17.33% tested by NREL

Yangtai Advanced Solar Power was established and Zhejiang Energy Group became one of the strategic investor of ASP.

**2018**

The tenth anniversary of ASP

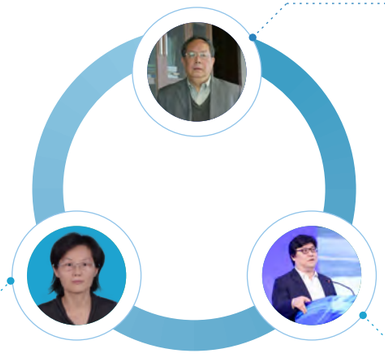
Shenzhen Capital Holdings became one of the strategic investor of ASP and the second generation production line had been built

**2019**

Complete the China Pavilion BIPV project at Beijing Expo. Finished the 863 projects.;

ASP (SEG) production line was put into production

## Management Team



### Chairman:Xuanzhi Wu

Founder of ASP

Former senior scientist of the NREL (National Renewable Energy Laboratory)

One of the "206 heroes in the Seventh Five-Year Plan" and the first group of experts to enjoy special allowances from the State Council of China.

American NREL Dean Award, Outstanding Contribution Award of the Year

Created and maintained a world record of 16.7% for the photo-electric conversion efficiency of cadmium telluride thin film solar cells in 2001

### CTO: Jie Zhou

CTO of ASP

PhD in Chemical Engineering, Colorado School of Mines, USA

Worked in Beijing Institute of Chemistry,Chinese Academy of Sciences, and NREL

Leader of 863 project of high efficiency CdTe thin film technology

### CEO：Ben Wu

Co-funder and CEO of ASP

MBA of Columbia University Business School, Management Specialist

He had worked for McKinsey, a well-known global strategy consulting company, and several venture capital companies.

He has led many international corporate mergers and acquisitions, and has extensive experience in strategic consulting and management.

## Main business

### CdTe thin film technology

R & D, production and sales of CdTe thin film solar modules

### Integration & operation of PV applications

Rich experience in distributed power stations, BIPV and agricultural photovoltaics

New BIPV products and applications

Distributed photovoltaic power station

Agricultural photovoltaic

### Thin film module production line and technical output service

Technology for market with powerful local partners

## Major Shareholders & Joint Ventures

ASP 龙焱能源科技

**Shareholders**

- **Zhejiang Zheneng Venture Capital Co., Ltd.**
  Zhejiang State-owned Assets Supervision and Administration Commission; Zhejiang Energy Group Co., Ltd.
- **Shenzhen Capital Holdings Co., Ltd.**
  Shenzhen State-owned Assets Supervision and Administration Commission

**Joint Ventures**

① **Advanced SolTech Renewable Energy Hangzhou Co., Ltd.**
Established by Sweden's SolTech and ASP, it is committed to investing in distributed photovoltaic power plants across China and successfully issuing "green energy bonds that can be freely traded on the Nasdaq market" in Europe.

② **Shenzhen SEG Advanced Solar Power Co., Ltd.**
A joint venture and production base established by Shenzhen SEG group & ASP

③ **Guangdong Deheng Advanced Solar Power Co., Ltd.**
A joint venture and production base established by Shanxi Yangtai group & ASP

④ **Guangdong Deheng Advanced Solar Power Co., Ltd.**
A joint venture and BIPV production base established by Guangdong Desheng Jiaheng Group & ASP

⑤ **Zhejiang Energy Advanced Solar Power Co., Ltd.**
A joint venture and production base of large size CdTe thin film modules, established by Zhejiang Energy Group & ASP

# 03
# Product Description

## Safety and Environment - Friendly

Scientists in Brookhaven national laboratory US systematically studied the heavy metal emissions from renewable energy, such as crystalline silicon solar cell, CdTe thin film solar cell, and traditional energy, such as coal, oil, natural gas and nuclear energy. In the analysis of solar cell, the full life-cycle process was considered including the original processing of ores required for the solar cell materials, the production and use of solar cells, etc.. The study results show that the highest cadmium emission is oil which achieves 44.3g/GWh, the second highest is coal about 3.7g/GWh. The cadmium emission of CdTe thin film solar module is only 0.3g/GWh as same as natural gas.

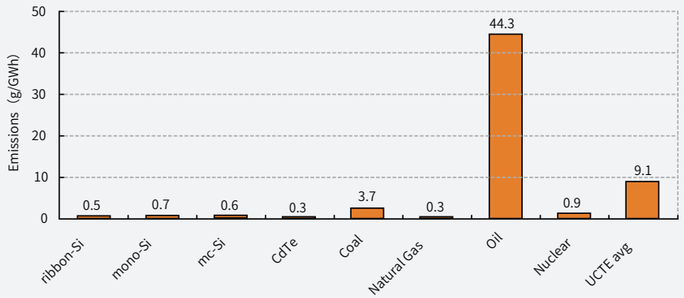



Fig.1 Cadmium emissions of solar modues and other energy comparison

Based on extensive experimental data proving that CdTe solar product is environment-friendly, the EU exempted CdTe modules for RoHs requirements in 2011. By developing a recycling technology, ASP is able to recycle used CdTe modules.

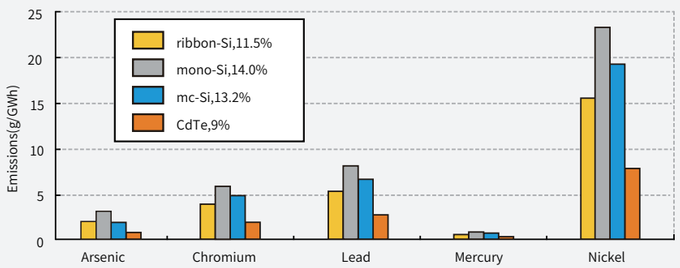



Fig 2. Comparison of Heavy metals in Silicon solar cells and cadmium telluride solar cell emissiongs

In the summary, with the lowest cost of power generation, the ASP CdTe thin film solar module can help the world to achieve the revolution of clean energy and harvests of both economic and environmental benefits.





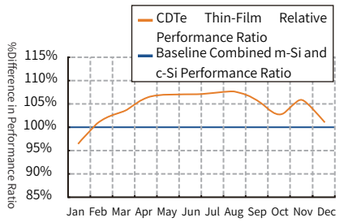
## CdTe Thin Film Solar Module Advantages

### EXCELLENT POWER GENERATION PERFORMANCE

ASP series CdTe thin film modules have a high efficiency and a proven excellent record on power generation performance.

Comparing to crystalline silicon solar module, CdTe thin film modulegenerates 5.4% more in average ofelectricity every year in Europe.

(PHOTO' s 2nd Thin Film Conference)



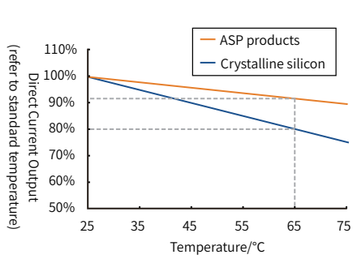

Comparison of Thin Film vs Crystalline Silicon Performance for 88 Projects

### HIGH CONVERSION EFFICIENCY

Cadmium Telluride is a semiconductor compound with a high absorption coefficient-100 times higher than silicon. The band gap width of cadmium telluride is more suitable for photovoltaic energy conversion than silicon. To absorb the same amount of light, the thickness of cadmium telluride film is only one hundredth that of silicon wafer. Today, the world record of cadmium telluride thin film conversion efficiency has reached 22.1% in the laboratory. And the CdTe thin film solar module produced by Advanced Solar Power (Hangzhou) Inc reaches to 14% and above on conversion efficiency. The ASP series products have obtained TUV, UL and CQC certifications.

### LOW TEMPERATURE COEFFICIENT

The temperature coefficient of ASP CdTe thin film solar moduleis only about -0.21%/°C, as the traditional silicon solar module temperature coefficient reaches to -0.48%/°C. For most of high solar irradiance regions on earth, the temperature of solar module at working can reach to 50°C or above. Thus this fact have greater




Generating capacity comparison at different temperature

### EXCELLENT LOW-IRRADIANCE EFFECT

Cadmium telluride is a direct-band gap material with high absorption for the full spectrum. Under low lightcondition, in dawn, dusk of a day or in a diffuse lighting, the power generation performance of CdTe thin film solar module has been proven to be higher than that of crystalline silicon solar module which is made by an indirect band gap material.

### GOOD STABILITY

No intrinsic light-induced degradation effects.

### LOW HOT SPOT EFFECT

The elongated cells of CdTe thin film module help to reduce the hot spot effect of module, which leads to a great advantage of improving the power generation capacity, ensuring the safety in usage and product life.

### MINIMAL BREAKAGE RATE

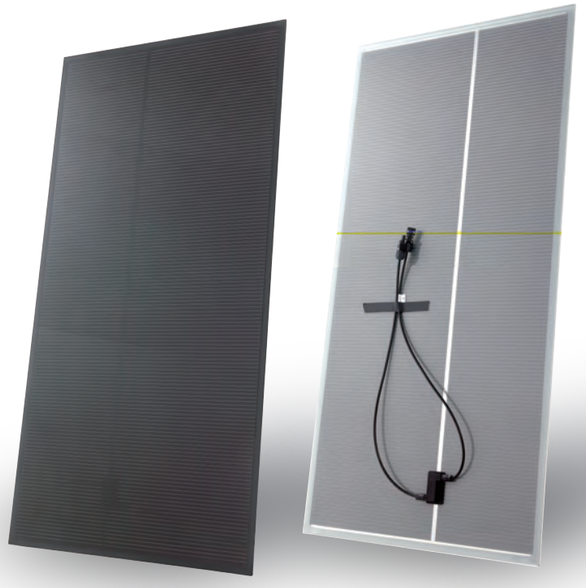
Contributed by a proprietary technology adapted in ASP's CdTe modules manufacturing process, ASP CdTe module has a minimal breakage rate.

### EXCELLENT APPEARANCE

CdTe modules have uniformity color - pure black which provides an excellent appearance, fit best in buildings that have higher standards on appearance, unity and energy-independance.

# Specifications

## ① STANDARD THIN FILM MODULE



| Standard Thin Film Module ASP-S1/S4 | | | | | | |
|---|---|---|---|---|---|---|
| | ASP-S1-90 | ASP-S1-94 | ASP-S1-100 | ASP-S1-105 | ASP-S1-110 | ASP-S4-85 |
| Nominal （Pm） | 90W | 94W | 100W | 105W | 110W | 85W |
| Open Circuit Voltage （Voc） | 122.0V | 122.5V | 123.5V | 123.5V | 123.5V | 29.2V |
| Short Circuit （Isc） | 1.06A | 1.08A | 1.13A | 1.20A | 1.25A | 4.19A |
| Voltage at Max. Power （Vm） | 96.0V | 98.0V | 98.5V | 98.5V | 98.5V | 23.0V |
| Current at Max. Power （Im） | 0.94A | 0.96A | 1.02A | 1.07A | 1.12A | 3.71A |
| Module Dimension | L1200*W600*D6.8mm | | | | | |
| Weight | 12.0kg | | | | | |
| Power Temperature Coefficient | -0.214%/°C | | | | | |
| Voltage Temperature Coefficient | -0.321%/°C | | | | | |
| Current Temperature Coefficient | 0.060%/°C | | | | | |
| Power Output | 25 years power output guarentee for 90% of nominal output during first 10 years and 80% over 25 years | | | | | |
| Material and Workmanship | 10 years | | | | | |
| Test Conditions | STC： 1000W/$m^2$, AM1.5, 25°C | | | | | |

## ② BIPV MODULE

# Customized services

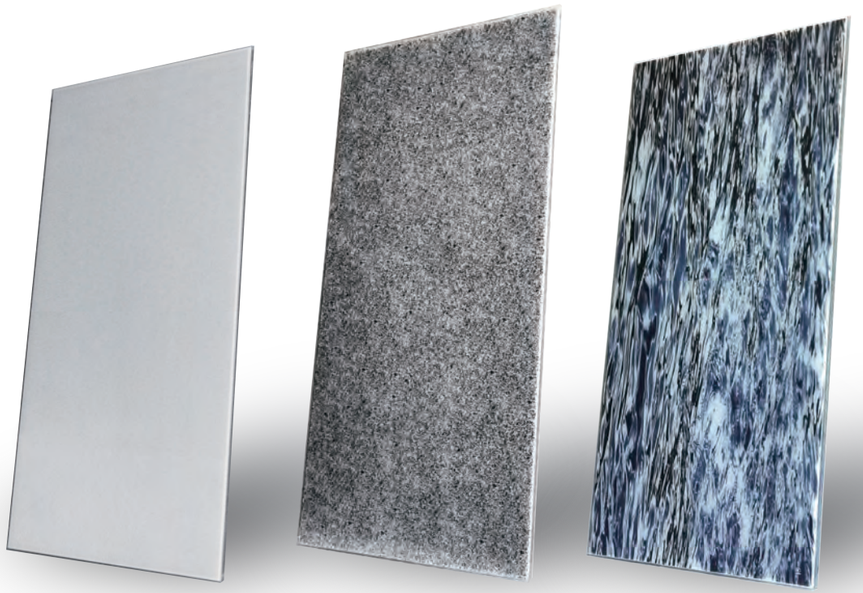
Transparency, dimension, color and pattern  can be customized by clients.

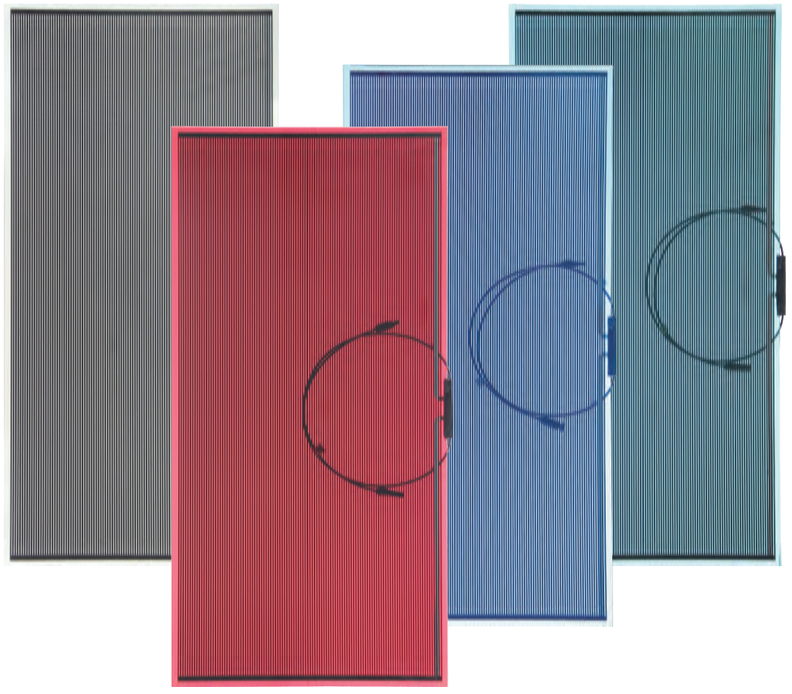
■ Transparent Effect

■ Adjustable transparency

■ Customizable patterns and colors

# Specifications





| | Imitation Aluminum Module ASP-IAL-T0 | | Imitation Aluminum Module ASP-IMAR-T0 |
|---|---|---|---|
| | ASP-IAL-T0-66 | ASP-IAL-T0-47 | ASP-IMAR-T0-42 |
| Nominal （Pm） | 66W | 47W | 42W |
| Open Circuit Voltage （Voc） | 122.5V | 122.5V | 122.5V |
| Short Circuit （Isc） | 0.77A | 0.55A | 0.49A |
| Voltage at Max. Power （Vm） | 98.0V | 98.0V | 98.0V |
| Current at Max. Power （Im） | 0.68A | 0.48A | 0.43A |
| Coating Model | SW-30E | SW-50E | SW-STONE |
| Module Dimension | L1200*W600*D16mm | | |
| Weight | 25.5kg | | |
| Power Temperature Coefficient | -0.214%/°C | | |
| Voltage Temperature Coefficient | -0.321%/°C | | |
| Current Temperature Coefficient | 0.060%/°C | | |
| Power Output | 25 years power output guarentee for 90% of nominal output during first 10 years and 80% over 25 years | | |
| Material and Workmanship | 10 years | | |
| Test Conditions | STC： 1000W/$m^2$, AM1.5, 25°C | | |

| Colored Semi-Transparent Module ASP-LAM2 | | | |
|---|---|---|---|
| | ASP-LAM2-T40-57 | ASP-LAM2-T20-76 | ASP-LAM2-T10-85 |
| Nominal （Pm） | 57W | 76W | 85W |
| Open Circuit Voltage （Voc） | 122.5V | 122.5V | 122.5V |
| Short Circuit （Isc） | 0.66A | 0.88A | 0.98A |
| Voltage at Max. Power （Vm） | 98.0V | 98.0V | 98.0V |
| Current at Max. Power （Im） | 0.58A | 0.78A | 0.87A |
| Transparency | 40% | 20% | 10% |
| Module Dimension | L1200*W600*D7.0mm | | |
| Weight | 12.0kg | | |
| Power Temperature Coefficient | -0.214%/°C | | |
| Voltage Temperature Coefficient | -0.321%/°C | | |
| Current Temperature Coefficient | 0.060%/°C | | |
| Power Output | 25 years power output guarentee for 90% of nominal output during first 10 years and 80% over 25 years | | |
| Material and Workmanship | 10 years | | |
| Test Conditions | STC： 1000W/$m^2$, AM1.5, 25°C | | |

# Specifications

| Insulated Module ASP-INS | | |
|---|---|---|
| | ASP-INS-T40-57 | ASP-INS-T20-76 |
| Nominal （Pm） | 57W | 76W |
| Open Circuit Voltage （Voc） | 122.5V | 122.5V |
| Short Circuit （Isc） | 0.66A | 0.88A |
| Voltage at Max. Power （Vm） | 98.0V | 98.0V |
| Current at Max. Power （Im） | 0.58A | 0.78A |
| Transparency | 40% | 20% |
| Therminal Conductivity | Minimum 1.2W/($m^2$·K) | |
| Module Dimension | L1200*W600*D31mm | |
| Weight | 27.5kg | |
| Power Temperature Coefficient | -0.214%/°C | |
| Voltage Temperature Coefficient | -0.321%/°C | |
| Current Temperature Coefficient | 0.060%/°C | |
| Power Output | 25 years power output guarentee for 90% of nominal output during first 10 years and 80% over 25 years | |
| Material and Workmanship | 10 years | |
| Test Conditions | STC： 1000W/$m^2$, AM1.5, 25°C | |

| Large-Size Semi-Transparent Module ASP-LAM3 | | |
|---|---|---|
| | ASP-LAM3-T40-164 | ASP-LAM3-T20-218 |
| Nominal （Pm） | 164W | 218W |
| Open Circuit Voltage （Voc） | 122.5V | 122.5V |
| Short Circuit （Isc） | 1.89A | 2.52A |
| Voltage at Max. Power （Vm） | 98.0V | 98.0V |
| Current at Max. Power （Im） | 1.68A | 2.23A |
| Transparency | 40% | 20% |
| Module Dimension | L1200*W1800*D18mm | |
| Weight | 40.3kg/$m^2$ | |
| Power Temperature Coefficient | -0.214%/°C | |
| Voltage Temperature Coefficient | -0.321%/°C | |
| Current Temperature Coefficient | 0.060%/°C | |
| Power Output | 25 years power output guarentee for 90% of nominal output during first 10 years and 80% over 25 years | |
| Material and Workmanship | 10 years | |
| Test Conditions | STC： 1000W/$m^2$, AM1.5, 25°C | |

| PV Tile ASP-PV-TILE | | |
|---|---|---|
| | ASP-PV-TILE-45 | ASP-PV-TILE-94 |
| Nominal （Pm） | 45W | 94W |
| Open Circuit Voltage （Voc） | 122.5V | 122.5V |
| Short Circuit （Isc） | 0.52A | 1.08A |
| Voltage at Max. Power （Vm） | 98.0V | 98.0V |
| Current at Max. Power （Im） | 0.46A | 0.96A |
| Module Dimension | L1275*W420*D42mm | L1275*W720*D42mm |
| Weight | 8.8kg | 15.8kg |
| Test Conditions | STC： 1000W/$m^2$, AM1.5, 25°C | |

# 04
# Projects

## Domestic Projects

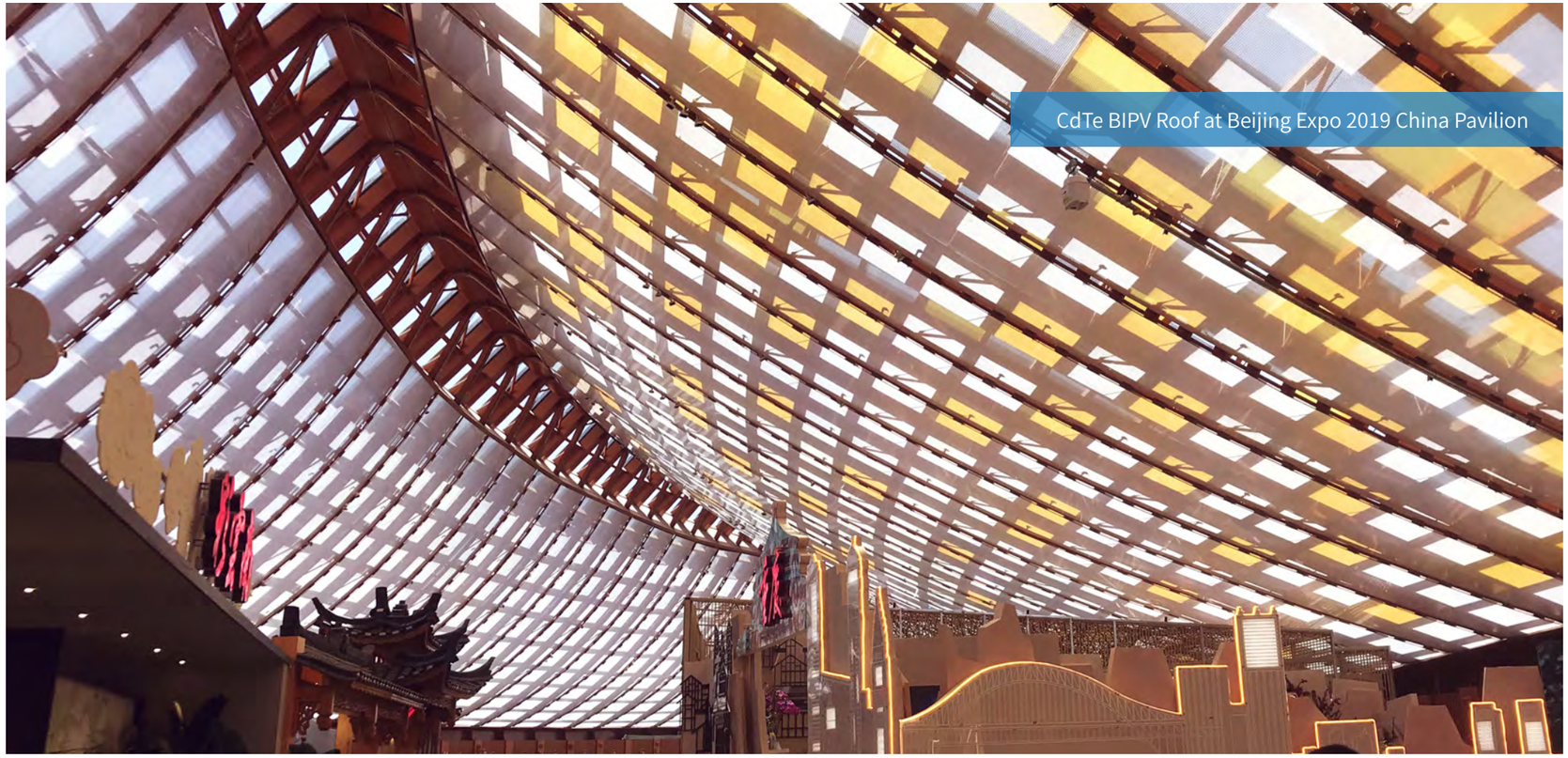
### ① BIPV(Building Integrated PV)

Customization：

The colors, dimensions and transparency of the modules can be customized to meet the needs of different customers. It not only meets the functional requirements of photovoltaic power generation, but also takes into account the basic functions and aesthetic requirements of the building.

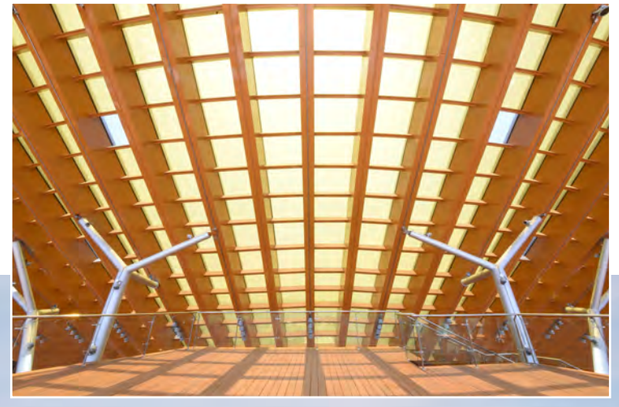
Green energy and environmental protection：

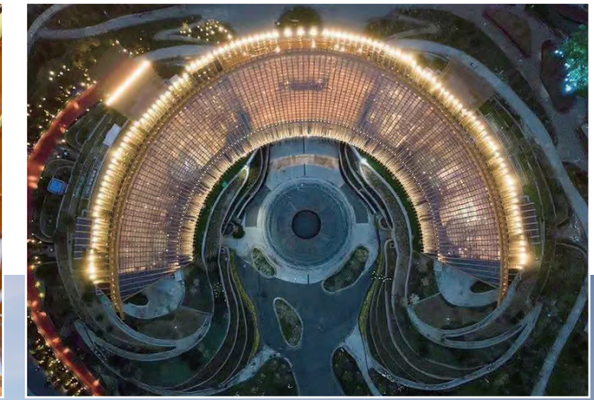
The installation of photovoltaic modules can achieve energy conservation, emission reduction, environmental protection, and reduction of pollution, providing people with healthy, applicable and efficient use of space, coexisting in harmony with nature. Taking the installation of 100m2 cadmium telluride thin-film photovoltaic modules in Beijing as an example, the total installed capacity is about 10KW, and a total of 103.1 tons of coal will be saved in 25 years, 70.11 tons of dust and 268.06 tons of carbon dioxide will be reduced. According to a tree in the absorption of 18.3 kg of carbon dioxide to calculate, it is equivalent to planting 600 trees per year and about 15,000 trees in 25 years. It has great value of environmental protection and benefits the society.



CdTe BIPV Roof at Beijing Expo 2019 China Pavilion

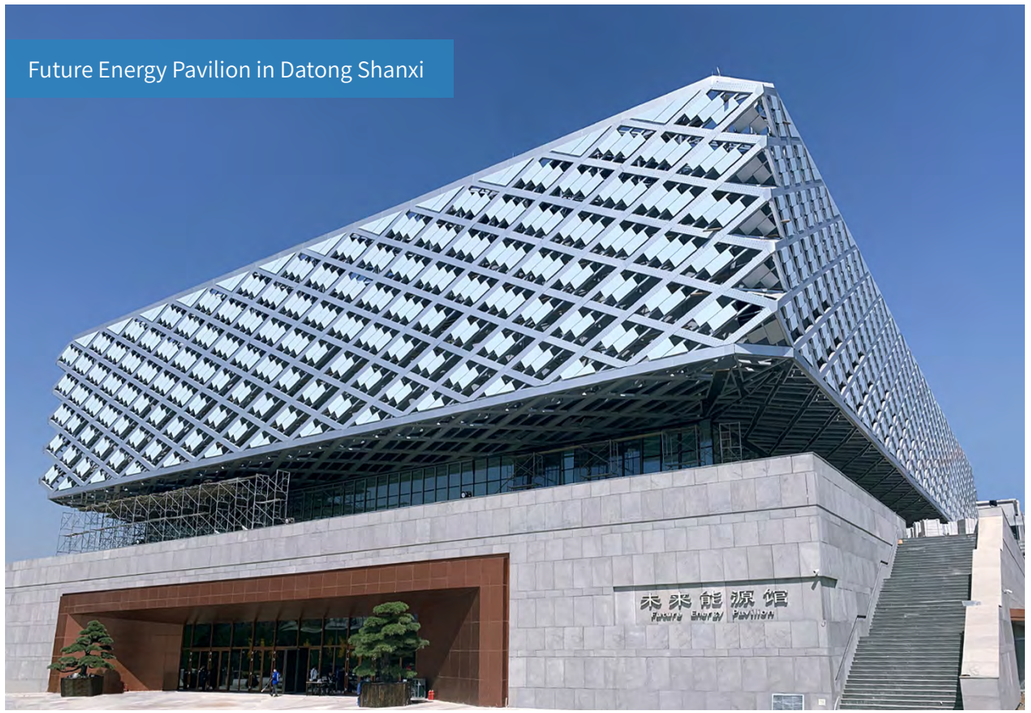
The steel structure roof of 2019 Beijing Expo China Pavilion is equipped with a large amount of photovoltaic glasses, which has a higher light absorption efficiency. This PV glass can better adapt to the building's morphological trend, making the China Pavilion a "living" green building.





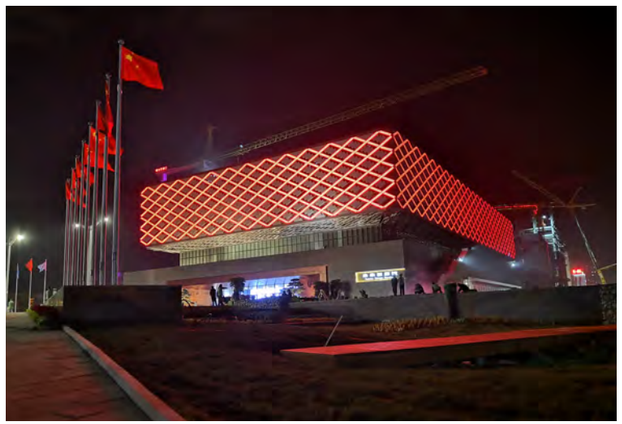
Beijing • Yanqing

# Domestic Projects




Future Energy Pavilion in Datong Shanxi

In the energy revolution promoted by President Xi, Shanxi energy revolution pacesetter exhibition hall will focus on showing the direction, path, task and achievements of the global energy revolution in all respects. It will strive to create a model that can lead the human energy revolution and fully demonstrate the Chinese program and Chinese wisdom in the global energy revolution. More than 1,300pcs white aluminum initation CdTe thin film modules were used on the facades of the exhibition hall innovatively, which will increase the application of CdTe modules as external wall building material!



Beijing • Tongzhou

The stage art base of The National Theatre

The base for stage art of the National Theatre is the largest and most sophisticated facility in the world that hosts activities such as design and production and as well warehousing.Various types of "power generating glass" were used in the building structures such as sun-rooms, curtain walls and roof-tops. The exterior of the eastern wing of Art Exchange Building looks no different from the ordinary glass curtain wall. However, it is now generating electricity for the entire building. In addition, a total of 608 KW CdTe thin film modules were installed on the rooftops of container warehouse and bulk warehouse of the base. In a case that power generating is in surplus, the system will sell the extra electricity to the national main grid.

# Domestic Projects

Qinghai Guotou Square's PV curtain wall project uses large-scale photovoltaic curtainwall components with customized sizes of 1200*1380 mm and 1200*1350 mm. The designer has carefully designed the perfect combination of traditional curtain wall and PV curtain wall, which is both green and novel. It also has a certain investment value.

Qinghai Guotou Square


Jiaxing Xiuzhou Science and Technology Center

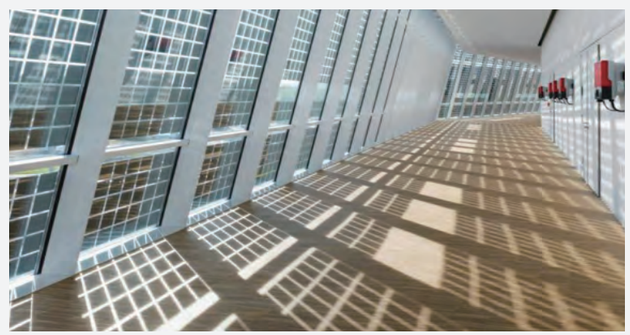
The PV curtain wall of Jiaxing Xiuzhou Science and Technology Center is the world's first high-rise building project with PV glass which just looks like the normal low-e glass . Architects separated the PV glass from ordinary glass cleverly, giving the building a unique three-dimensional and technological sense. During the implementation of the project, many difficult technical problems of PV curtain walls were encountered, which brought unprecedented challenges to PV glass production, module stringing, and wiring design. In the end, the perfect implementation of the project represented ASP's ability to be competent in "high, precise, sophisticated, and difficult" technology in the field of BIPV.

## Effect comparison of crystalline silicon PV curtain wall and cadmium telluride PV curtain wall

Compared with crystalline silicon modules, cadmium telluride thin film modules are more suitable for BIPV applications. They have controllable transmittance technology, cell substrates (usually glass or other flexible substrates) with relatively low cost. Different background colors, sizes, and cadmium telluride thin film battery modules can be deeply customized, taking into account the architectural functions and overall aesthetic effects.

The appearance of CdTe semi-transparent module is beautiful and atmospheric. Does not influnce the external viewing.

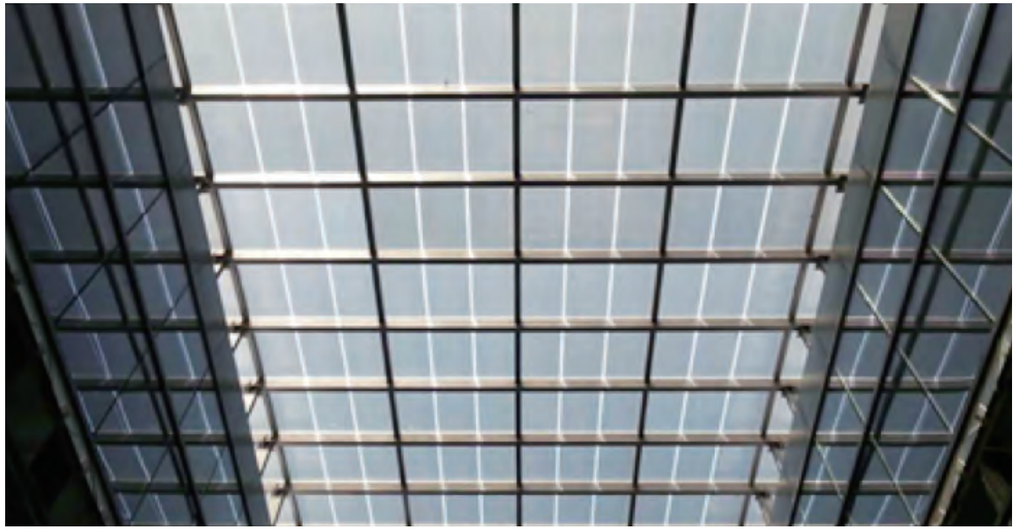
The crystalline silicon double-glass module has a serious blocking effect on light and location, which easily causes visual fatigue.



# Domestic Projects


■ Jiaxing PV Technology Exhibition Hall

Jiaxing PV Technology Exhibition Hall, the first public building with full BIPV components in China, has a total construction area of 8,695 square meters, of which 5,556 square meters are installed by photovoltaic curtain walls. The external structure of the entire building, from the curtain wall to the roof, uses ultra-large-area, high-light-transmission building photovoltaic integrated components developed by ASP. It is currently the largest building in China that uses all power-generating glasses.



■ The skylight with CdTe BIPV modules on the lobby of Lenovo headquarter in Beijing

■ CdTe Photovoltaic Lighting Roof of Tianjin Nursing Home

# Domestic Projects

## Hangzhou Sanbao drainage pumping station

Hangzhou Sanbao drainage pumping station uses the roof of the drainage project to build a roof side light-transmitting photovoltaic system that is connected to the grid on the user side. The project covers an area of about 1,000 square meters and uses a CdTe (cadmium telluride) thin film solar cell module with a light transmittance of 20%. The total installed capacity is 60KW and it can geneate 60,000 degrees of electricity per year.

Awarded the China Construction


## Photovoltaic awning at Shenzhen Technology University


## Green House at Zhejiang Vocational and Technical University

# Domestic Projects


Hainan Hengda haihua Island Landmark Architecture Museum

Twin Towers Hotel

Construction site at Haihua Island Science and Technology Museum

Demo BIPV project at Binjiang Shuangchuang Base of State Grid


# Domestic Projects

## ② Photovoltaic Power Station

Photovoltaic power stations have the advantages of high energy quality, short construction periods, safety and reliability, no risk of depletion, and no restrictions on the geographical distribution of resources. The rooftop distributed photovoltaic power plant is an important direction for the development of photovoltaics in the future. Using idle rooftops to construct photovoltaic projects can not only reduce energy consumption, but also make full use of idle resources, which will play a role in energy conservation and emissions reduction, and will bring huge Economic benefits, environmental benefits and good social effects.

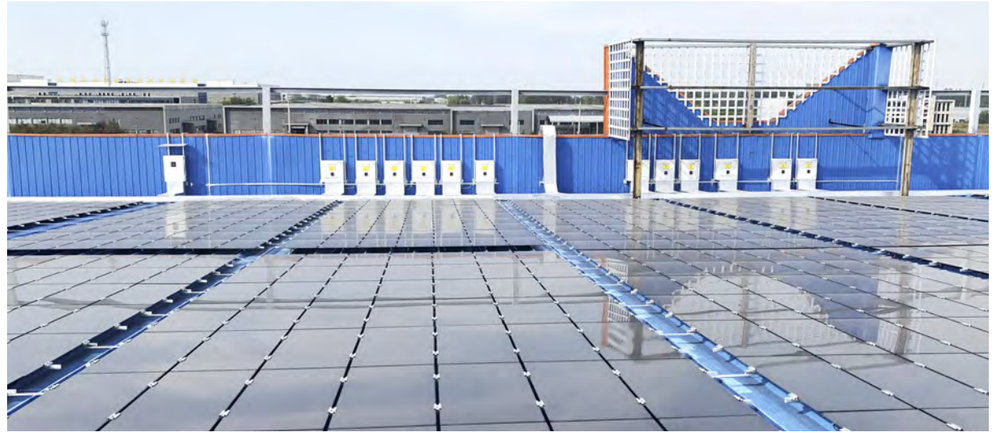
Roof PV Power Station at Shenzhen Graduate School of Beijing Institute of Technology

Shenzhen Huaxing G11 Factory (Acquired LEED Platinum Certification)


Roof-top PV Installation at New Gonow,5.4MW

Roof-top PV Installation in Qingyuan,4.8MW

Roof-top PV Installation at Jurun,2.4MW

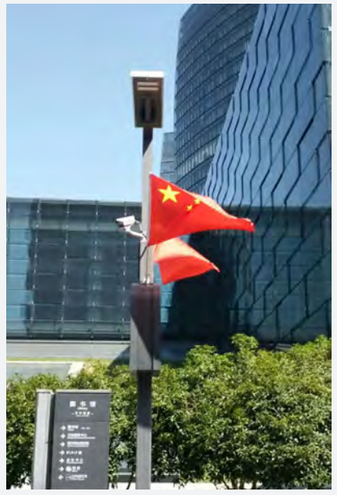


Roof-top PV Installation at Runchang, 2.3MW

# Domestic Projects

## ③ Off-grid system Applications

PV Power Station at Baita Lake Ecological Park in Zhuji Zhejiang



PV Street Light at Civic Center

PV Street Light at Beijing Fangshan

PV Seismic Monitoring System in Heilongjiang

Off-grid CdTe Power Station at Qinghai Juewu Temple (5500 meters above sea level)


Off-grid CdTe PV station in Zhejiang Qiandao Lake


PV tile installation on Beijing quantum toilet

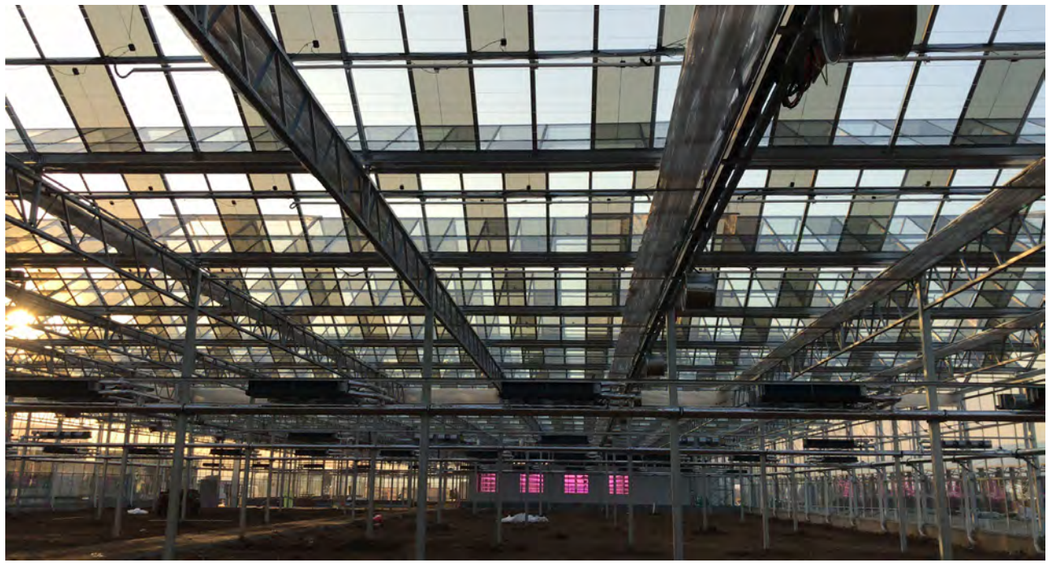
# Domestic Projects

## ④ Agricultural PV

ASP adheres to the social responsibility concept of “independent innovation, dedication to society, scientific development, and co-construction,” and actively responds to national policies. We have participated in the construction of photovoltaic agriculture and photovoltaic poverty alleviation projects in multiple provinces and regions, in order to promote the development of modern agriculture , help alleviate poverty and promote social harmony and progress.

3,000 square meters photovoltaic agricultural greenhouse in Suzhou Fengmenglong Village

### PV Agricultural Greenhouse in Xihe, Nanjing



# International Projects

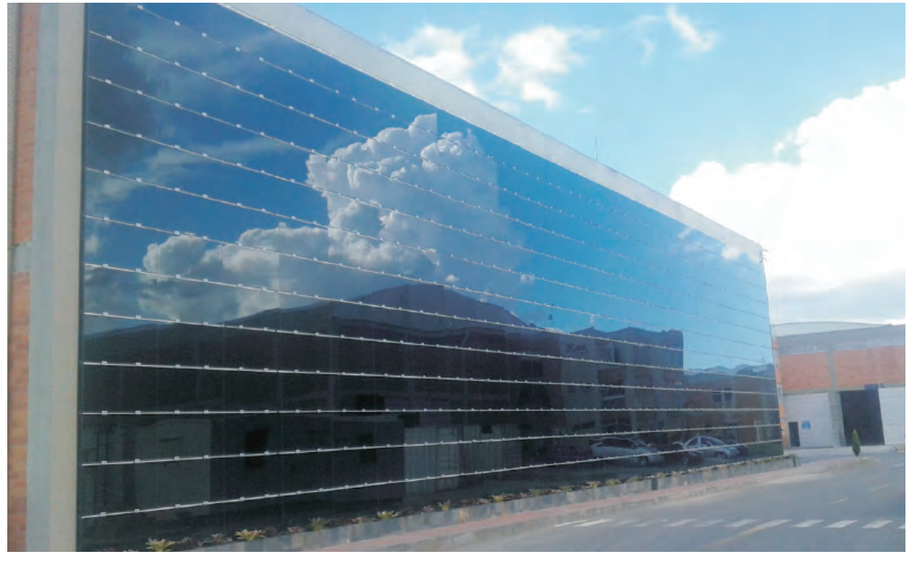
With the implementation of the global sustainable development strategy, the photovoltaic power generation technology and application has been strongly supported by many governments.ASP's CdTe thin film technology has been recognized by many countries. Currently, ASP has obtained product certifications like TUV, UL, CQC, etc. and ISO9001 quality management system certification. Overseas projects are located in 38 countries and regions around the world.

## ① BIPV(Building Integrated PV)

### Colored Semi-transparent PV Curtain Wall at a stereo garage in Swedish

ASP signed a strategic cooperation agreement with SAPA group to make extensive use of CdTe thin film BIPV modules in Europe.

PV curtain wall at a school in Sweden



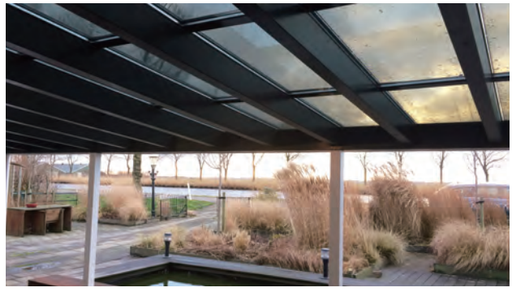
PV curtain wall in Colombia

# International Projects

Gas station with PV skylight in Sweden

PV Curtain Wall at OZG hospital

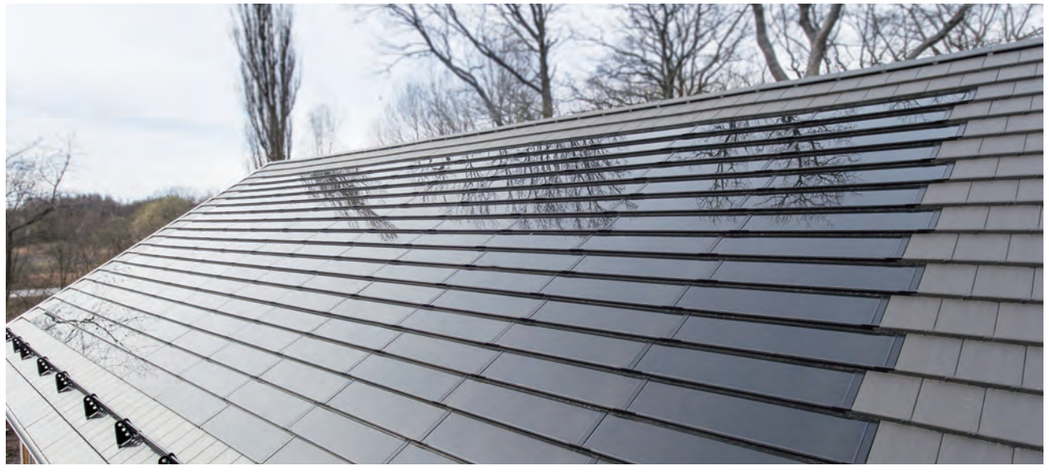
PV Skylight in Europe



Dutch Photovoltaic Canopy-Indoor

Meeting Room with PV Skylight in Netherlands

Photovoltaic tile roof in Europe



Residential House with PV tiles in Sweden

# International Engineering Case

## ② Photovoltaic Power Station

Roof-top PV Installation in Chicago, USA

Roof-top PV Installation in a Sri Lanka

Hotel roof-top PV installatio in Sweden

Photovoltaic canopy in Switzerland

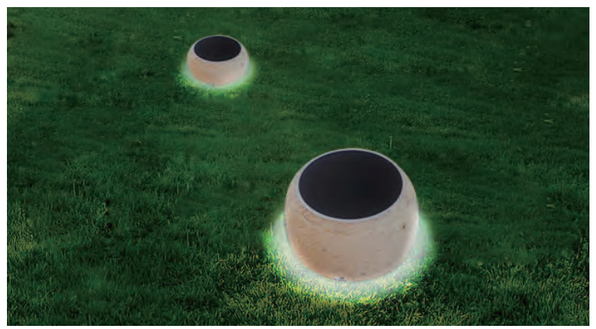
Civilian roof-top PV installatio in US

# International Projects

## ③ Off-grid System Applications

PV Water Pump, Morocco

PV Bus Kiosk, UK



PV Garden Light, Saudi Arabia

*Aim hign,Aim for future.*