

Global Solar Stone Digital Hub

PHOMI eCovering Smart Plant



PHOMI is transforming the building envelope industry with four core innovations: low-carbon materials, pioneering aesthetics, integrated photovoltaic technology, and cost efficiency.

As a disruptor of high-carbon building materials, PHOMI's products replace natural stone, tiles, precast concrete, and synthetic resin. By combining solar power and digital technology, PHOMI creates a "triple evolution path" for building envelopes: supporting municipal renewal, zero-carbon buildings, infrastructure upgrades, and aesthetic redesign. It provides a photovoltaic building-integrated (BIPV) energy system and a digital information platform.

This dual innovation in materials and functionality transforms building envelopes into smart, energy-efficient, and information-rich systems, reshaping the construction industry's value chain.

Certified for 18 consecutive years by international authorities with on-site inspections, rigorously tested in extreme climates from polar cold to equatorial heat, our products demonstrate proven reliability across 120 countries worldwide, achieving a global application milestone with over 60 million square meters of implemented solutions.



www.phomi.com

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eSolarFacade

Partner with the Sun to
Power Buildings On

Global Founder, Leader and Standard
Setter of econiclay covering(MCM)
**The 123rd Paris International
Invention Gold Award**
**The 76th Nuremberg International
Invention Gold Award**
China Patent Award

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Commercial eSolarFacade primarily targets the commercial/industrial building market, meeting the dual demands of businesses for renewable energy and enhanced aesthetic appeal in architecture.

Commercial/industrial BIPV needs to be customized based on the specific design and purpose of the building, so it is essential to intervene during the design phase to ensure the perfect integration of the product. Commercial eBIPV can be personalized according to the specific needs of clients and the characteristics of the building, including aspects such as size, shape, color, and texture.

Commercial eSolarFacade



Application scenarios

Commercial buildings: Commercial eSolarFacade is suitable for the exterior walls of various commercial buildings with non-glass curtain wall effects, providing renewable energy and enhancing the corporate image.

Public facilities: Such as facade decorations for stations, airports, sports venues, road sides, bridge piers, and fences, offering both decoration and green energy solutions.

Customized eSolarFacade advantages

Unlimited material expressiveness:

The same effect as various natural materials such as stone, wood, and brick, perfectly integrating with the appearance of the building.

Breaking through the limitations of traditional photovoltaic applications:

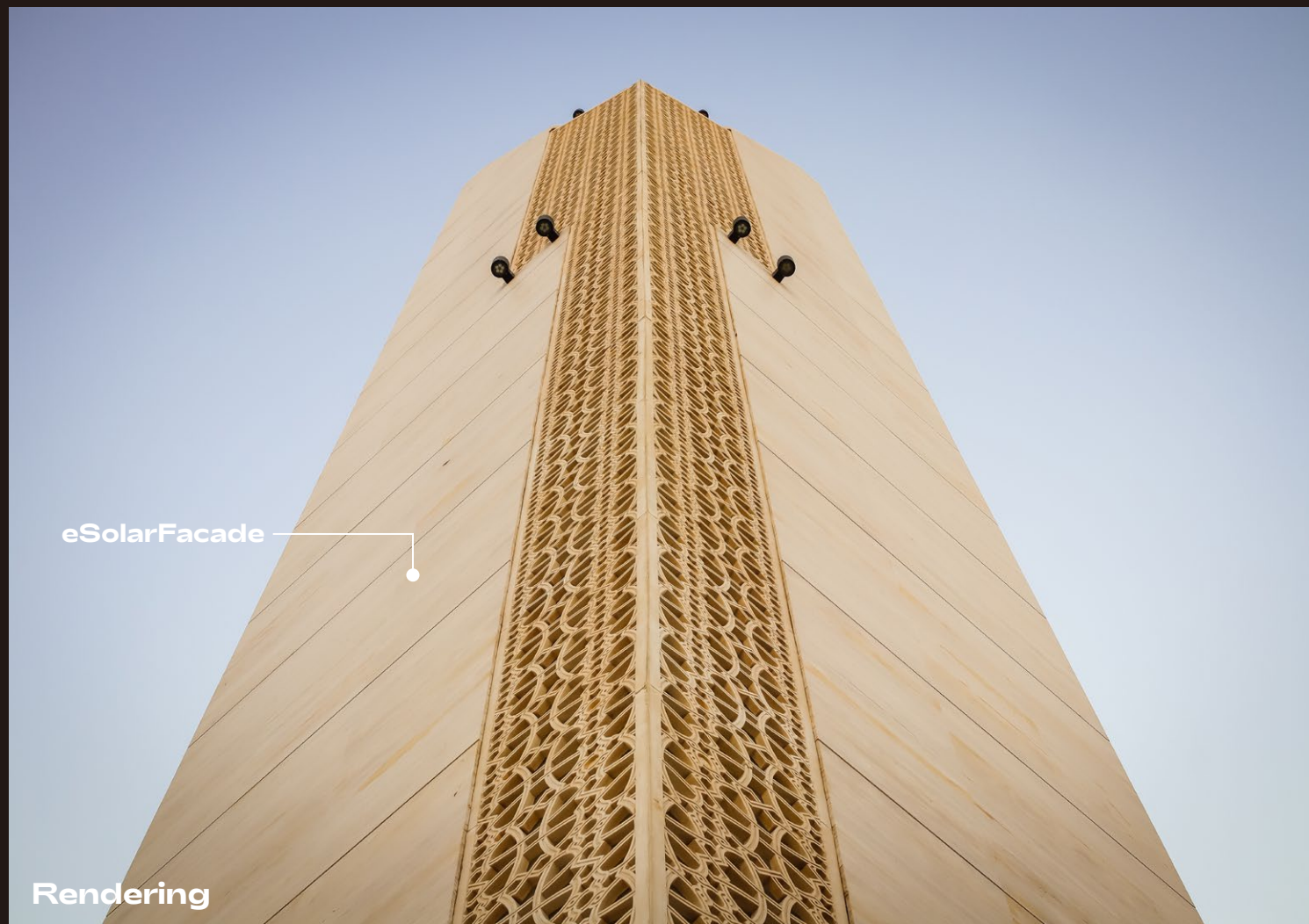
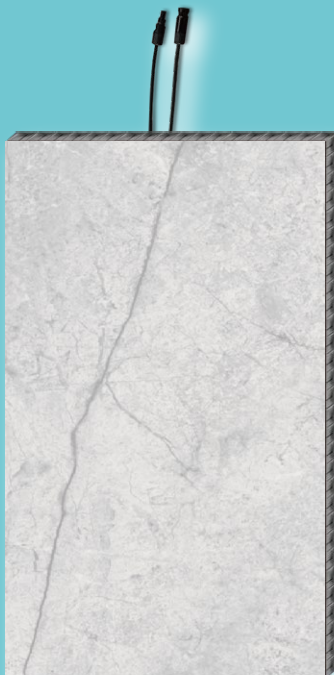
Over 95% of buildings worldwide use non-glass curtain wall designs, while traditional glass BIPV technology is primarily limited to glass curtain walls and windows. eSolarFacade products break through this limitation, allowing for flexible application across a wide range of architectural styles, significantly expanding the scope of photovoltaic technology in the building sector.

Higher (power conversion) efficiency and lower carbon emissions:

Its power conversion efficiency is 90% higher than that of glass BIPV with a transparency of 60%, with 54.6% more carbon reduction than glass BIPV.

More functional customization:

In addition to power generation, eSolarFacade can also be customized to meet client needs for advertising display, insulation, thermal resistance, soundproofing, and other functions, enhancing the overall performance and comfort of the building.

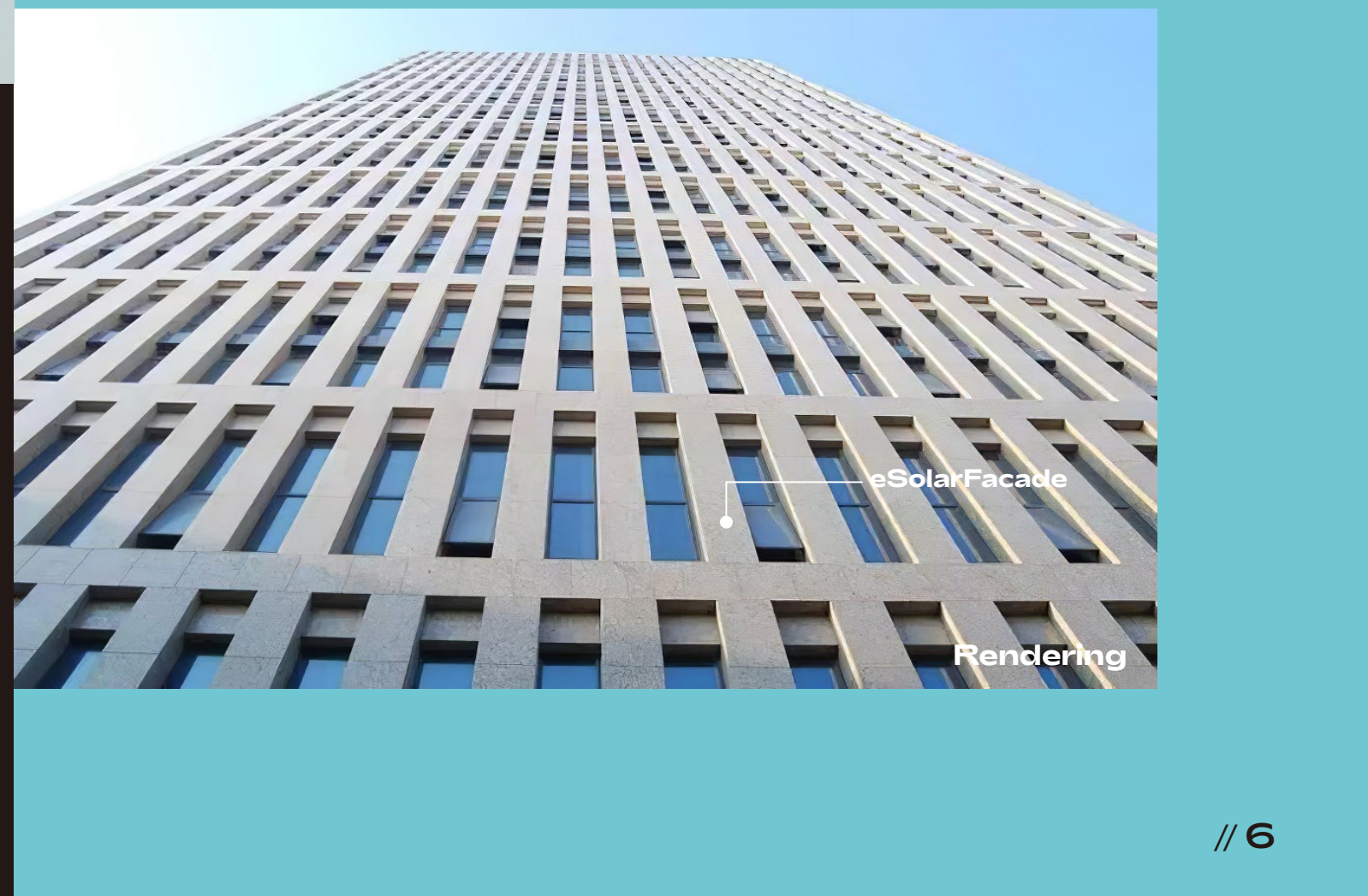
Proposed eSolarFacade type: Marble Castol Grey
Dimensions: 1140x570mm
Area: 1,890m²
Power: 120W/m²
Monthly electricity generation: 24,948 kwh (assuming 110 hours of standard solar irradiation per month)

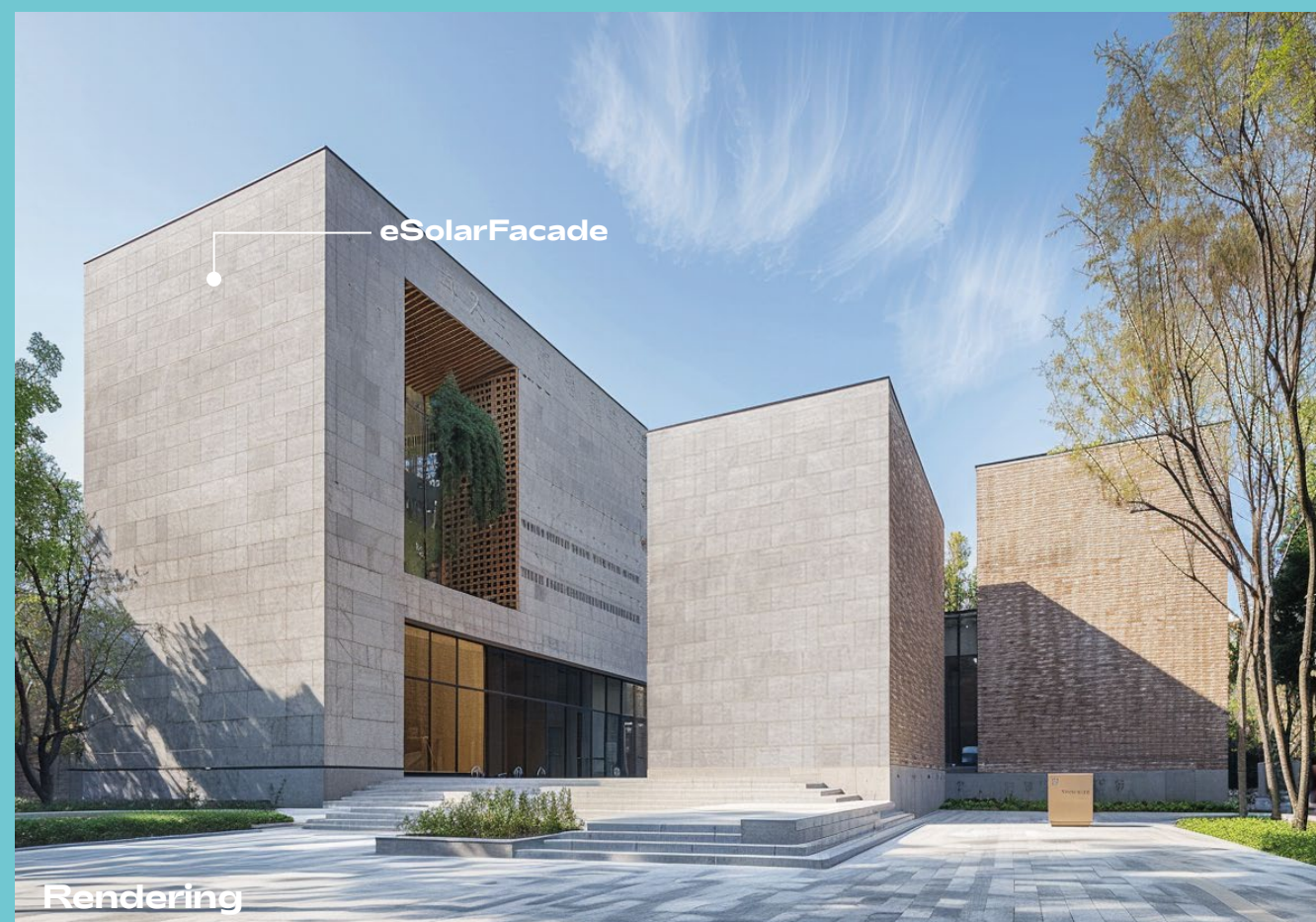
Proposed eCovering type: Marble Castol Grey
Dimensions: 1140x570mm(customized)
Area: 1,890m²
Full life cycle carbon reduction: compared to natural stone, eCoverings reduce carbon emissions by 138.7 tons of CO₂e.



Proposed eSolarFacade type: Marble Nile Light Yellow
Dimensions: 1140x570mm
Area: 5,670m²
Power: 130W/m²
Monthly electricity generation: 81,081 kwh (assuming 110 hours of standard solar irradiation per month)

Proposed eCovering type: Marble Nile Light Yellow
Dimensions: 1140x570mm(customized)
Area: 1,890m²
Full life cycle carbon reduction: compared to natural stone, eCoverings reduce carbon emissions by 138.7 tons of CO₂e.





Proposed eSolarFacade type: Marble Cloud Yellow

Dimensions: 1140x570mm

Area: 1,890m²

Power: 130W/m²

Monthly electricity generation: 27,027 kwh (assuming 110 hours of standard solar irradiation per month)

Formula: $(130 \text{ W/m}^2) \times (110 \text{ hours/month}) \times (1,890 \text{ m}^2) \div 1000 = 27,027 \text{ kwh/month}$

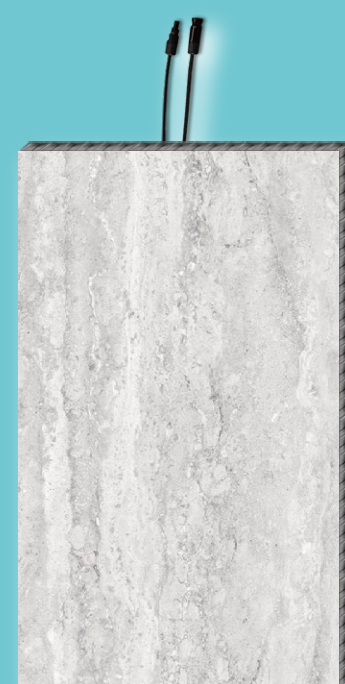
Proposed eCovering type: Marble Cloud Yellow (non-sunny side and non-standard area)

Dimensions: 1140x570mm(customized)

Area: 1,890m² (Includes non-standard custom specifications)

Full life cycle carbon reduction: compared to natural stone, Phomi solutions reduce carbon emissions by 416.1 tons of CO₂e.

Note: In a full life cycle, 1m² of natural stones emit 74.41kg CO₂e, 1m² of eCoverings emit 1.02kg CO₂e (according to international database). Carbon Emission Reduction Formula: $138.71 \text{ t CO}_2\text{e} = (74.41 \text{ kg/m}^2 - 1.02 \text{ kg/m}^2) \times 1,890 \text{ m}^2$



Proposed eSolarFacade type: Marble Cloud Grey

Dimensions: 1140x570mm

Area: 2,835m²

Power: 130W/m²

Monthly electricity generation: 40,540 kwh (assuming 110 hours of standard solar irradiation per month)

Formula: $(130 \text{ W/m}^2) \times (110 \text{ hours/month}) \times (2,835 \text{ m}^2) \div 1000 = 40,540 \text{ kwh/month}$

Proposed eCovering type: Marble Cloud Grey (non-sunny side and non-standard area)

Dimensions: 1140x570mm(customized)

Area: 5,670m²

Full life cycle carbon reduction: compared to natural stone, eCoverings reduce carbon emissions by 416.12 tons of CO₂e.

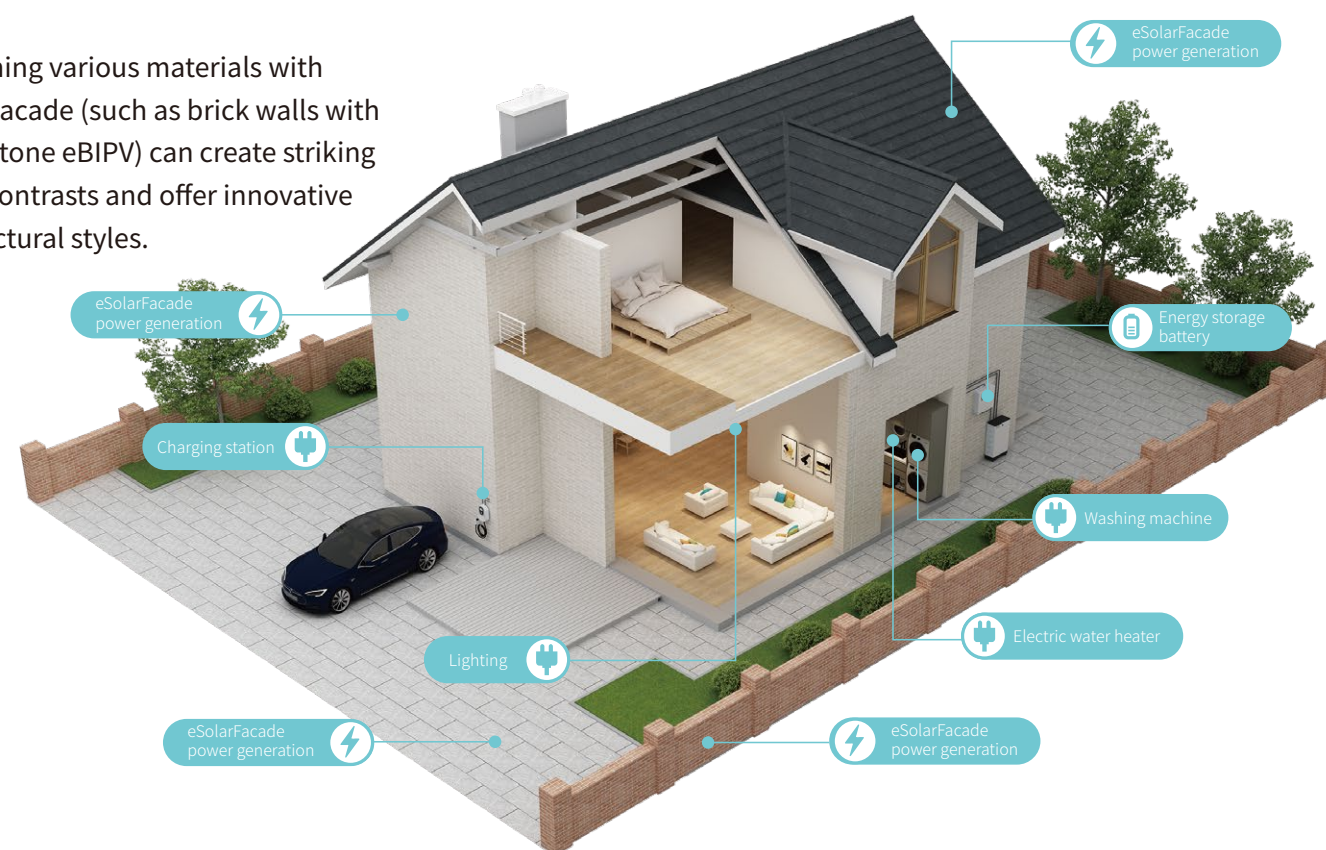
Note: In a full life cycle, 1m² of natural stones emit 74.41kg CO₂e, 1m² of eCoverings emit 1.02kg CO₂e (according to international database). Carbon Emission Reduction Formula: $416.12 \text{ t CO}_2\text{e} = (74.41 \text{ kg/m}^2 - 1.02 \text{ kg/m}^2) \times 5,670 \text{ m}^2$



The civil eSolarFacade can be installed at the designated locations on existing buildings, including the exterior walls, roofs, and fences of residential buildings. It does not require complex design, with standardized specifications and easy installation, making it perfect for DIY applications.

Civil eSolarFacade can seamlessly integrate with and maintain the original building appearance by matching the building materials (such as stone, wood, or brick).

Combining various materials with eSolarFacade (such as brick walls with wood/stone eBIPV) can create striking visual contrasts and offer innovative architectural styles.



Civil eSolarFacade

Civil eSolarFacade advantages

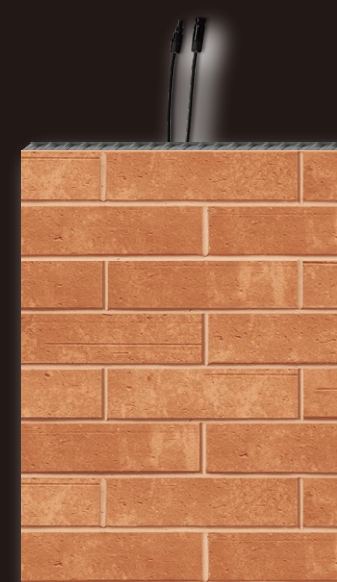
Civil eSolarFacade is not only suitable for exterior walls and roofs but also for a wider range of architectural elements, such as fences and balcony railings, offering more possibilities for partial applications on existing buildings. In contrast, glass BIPV, restricted by its transparent nature, is more suitable for areas requiring natural light, such as roofs and certain wall sections, making its application scenarios relatively limited.

The versatility of eSolarFacade allows for easy transformation of architectural styles and DIY installation through mixing different materials and colors, catering to diverse aesthetic needs, while glass BIPV offers a more singular style.

Civil eSolarFacade offers a variety of material options, including stone, wood, and brick, allowing it to seamlessly integrate into various architectural styles and enhance the overall aesthetic of the building. In contrast, glass BIPV has a single material manifestation, making it difficult to blend with all architectural styles, especially in situations where it is necessary to maintain or emphasize the original material characteristics of the building.

Civil eSolarFacade has a simple and quick installation process that requires no complex design, thereby reducing installation costs and time. In contrast, glass BIPV involves considerations of light transmittance and structural strength, making the design and installation process relatively complex, with longer design and construction periods and higher costs.

A wall, a micro power station.



Proposed eSolarFacade type: G Idyllic Orange
Dimensions: 1140x570mm
Area: 50 pieces
Power: 55W/piece
Monthly electricity generation: 302.5 kwh (assuming 110 hours of standard solar irradiation per month)
Formula: $(55 \text{ W/piece}) \times (50 \text{ pieces}) \times (110 \text{ hours/month}) \div 1000 = 302.5 \text{ kwh/month}$



Proposed eSolarFacade type: G Snowy Brown
Dimensions: 1140x570mm
Area: 100 pieces
Power: 55W/piece
Monthly electricity generation: 605 kwh (assuming 110 hours of standard solar irradiation per month)
Formula: $(55 \text{ W/piece}) \times (100 \text{ pieces}) \times (110 \text{ hours/month}) \div 1000 = 605 \text{ kwh/month}$



A wall, a micro power station.

A wall, a micro power station.



Proposed eSolarFacade type: G Idyllic White
Dimensions: 1140x570mm
Area: 30 pieces
Power: 55W/piece
Monthly electricity generation: 181.5 kwh (assuming 110 hours of standard solar irradiation per month)
Formula: $(55 \text{ W/piece}) \times (30 \text{ pieces}) \times (110 \text{ hours/month}) \div 1000 = 181.5 \text{ kwh/month}$



Proposed eSolarFacade type: Poly Wood Yoly
Dimensions: 1140x570mm
Area: 60 pieces
Power: 55W/piece
Monthly electricity generation: 363 kwh (assuming 110 hours of standard solar irradiation per month)
Formula: $(55 \text{ W/piece}) \times (60 \text{ pieces}) \times (110 \text{ hours/month}) \div 1000 = 363 \text{ kwh/month}$

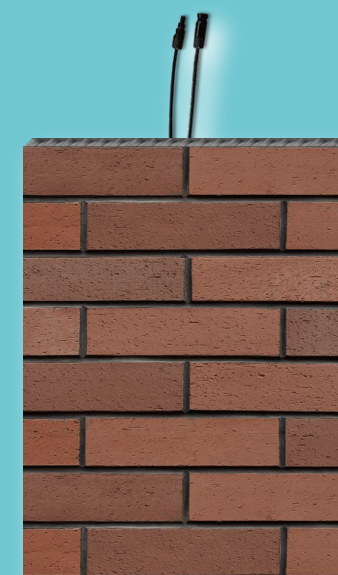


A wall, a micro power station.

A wall, a micro power station.



Proposed eSolarFacade type: G Idyllic Orange
Dimensions: 1140x570mm
Area: 60 pieces
Power: 55W/piece
Monthly electricity generation: 363 kwh (assuming 110 hours of standard solar irradiation per month)
Formula: $(55 \text{ W/piece}) \times (60 \text{ pieces}) \times (110 \text{ hours/month}) \div 1000 = 363 \text{ kwh/month}$



Proposed eSolarFacade type: G Idyllic Red
Dimensions: 1140x570mm
Area: 30 pieces
Power: 55W/piece
Monthly electricity generation: 181.5 kwh (assuming 110 hours of standard solar irradiation per month)
Formula: $(55 \text{ W/piece}) \times (30 \text{ pieces}) \times (110 \text{ hours/month}) \div 1000 = 181.5 \text{ kwh/month}$



A wall, a micro power station.

A wall, a micro power station.



Proposed eSolarFacade type: Spliced Wood Silk-mist Brown
Dimensions: 1140x570mm
Area: 60 pieces
Power: 55W/piece
Monthly electricity generation: 363 kwh (assuming 110 hours of standard solar irradiation per month)
Formula: $(55 \text{ W/piece}) \times (60 \text{ pieces}) \times (110 \text{ hours/month}) \div 1000 = 363 \text{ kwh/month}$

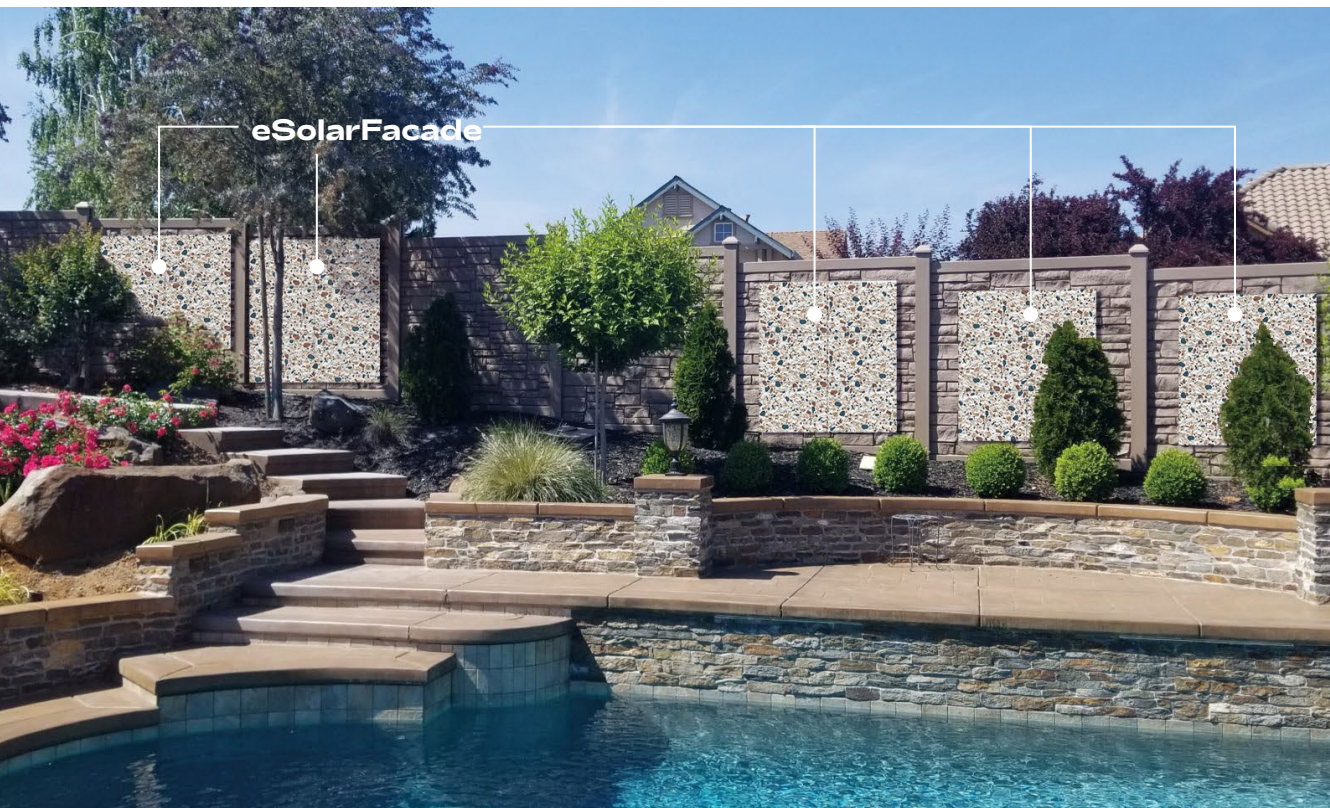


Proposed eSolarFacade type: Spliced Wood Twilight Mountain Gray
Dimensions: 1140x570mm
Area: 80 pieces
Power: 55W/piece
Monthly electricity generation: 484 kwh (assuming 110 hours of standard solar irradiation per month)
Formula: $(55 \text{ W/piece}) \times (80 \text{ pieces}) \times (110 \text{ hours/month}) \div 1000 = 484 \text{ kwh/month}$



A wall, a micro power station.

A wall, a micro power station.



Proposed eSolarFacade type: Stone Brick Copper Rust Red

Dimensions: 1140x570mm

Area: 35 pieces

Power: 55W/piece

Monthly electricity generation: 211.75 kwh (assuming 110 hours of standard solar irradiation per month)

Formula: $(55 \text{ W/piece}) \times (35 \text{ pieces}) \times (110 \text{ hours/month}) \div 1000 = 211.75 \text{ kwh/month}$



Proposed eSolarFacade type: Bush Hammered Starry

Dimensions: 1140x570mm

Area: 30 pieces

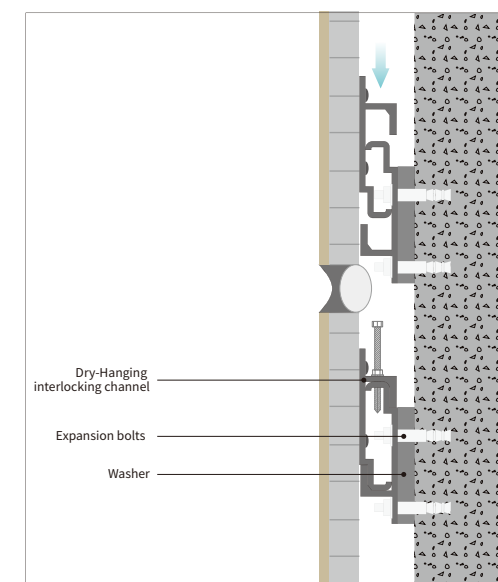
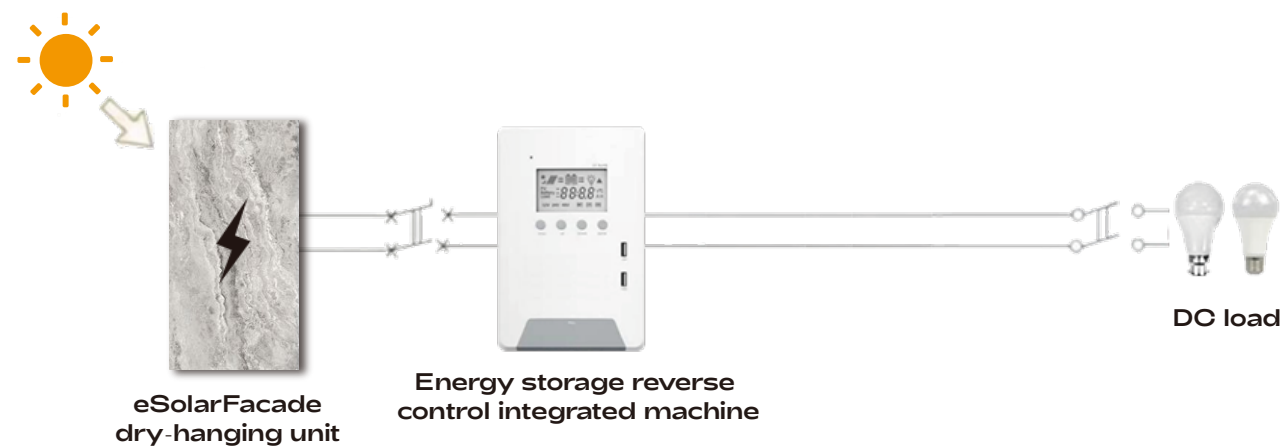
Power: 55W/piece

Monthly electricity generation: 181.5 kwh (assuming 110 hours of standard solar irradiation per month)

Formula: $(55 \text{ W/piece}) \times (30 \text{ pieces}) \times (110 \text{ hours/month}) \div 1000 = 181.5 \text{ kwh/month}$

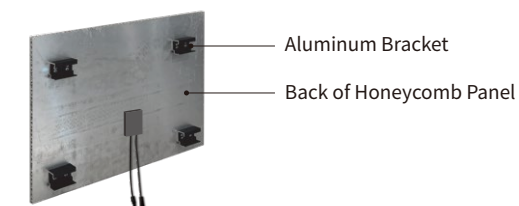


A wall, a micro power station.



Schematic diagram of Dry-Hanging

- 1 Attach/Secure the aluminum brackets to the back of the honeycomb panel with bolts and nuts.



- 2 Secure the aluminum rail with expansion bolts to the solid wall. Insert the aluminum brackets of honeycomb panel into the aluminum rail on the solid wall, then secure the brackets to the rail with screws (bolts and nuts).



eSolarFacade off-grid energy storage system

Civil eSolarFacade: When purchasing civil eSolarFacade, Phomi will provide you with (extra charge) an off-grid energy storage system, including storage batteries, controllers, and inverters, based on your order quantity. Please consult your local Phomi Agency for the pricing of eSolarFacade and the energy storage system.

Commercial eSolarFacade: The installation of the electrical components should proceed in sync with the setup of the curtain wall, strictly following the electrical design drawings and the relevant design and construction standards.

Installation and Maintenance

1. Cleaning: After acceptance, the frequency of cleaning should be determined based on the level of wall contamination, with a minimum of once a year. Use hand soap mixed with tap water, and avoid using organic solvents.
2. Curtain wall inspection and maintenance:
 - A comprehensive inspection of the curtain wall should be conducted every five years, including the panels, sealing strips, and sealants.
 - Tighten any loose bolts, and for corroded connectors, remove rust and repaint or replace them.
 - Loose or damaged panels should be repaired or replaced.
 - Sealants and sealing strips that have fallen off or are damaged should be repaired or replaced.
 - Damaged components or connectors should be replaced or reinforced if the anchoring is loose.
 - Regularly check the drainage system, and clear any blockages.
 - Any loose or damaged hardware should be replaced.
 - Conduct a comprehensive inspection and repair reinforcement after natural disasters.



eSolarFacade specifications

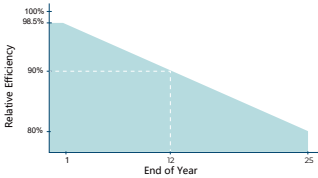
ELECTRICAL SPECIFICATIONS	
Test Conditions	STC
Maximum Power (Pmax)	59.23 ~ 166.62 W
Maximum Power Voltage (Vpmax)	20.70 ~ 29.22 V
Maximum Power Current (Ipmax)	2.86 ~ 5.70 A
Open Circuit Voltage (Voc)	24.18 ~ 35.52 V
Short Circuit Current (Isc)	3.15 ~ 6.17 A
Module Efficiency	9.12 ~ 17.63 %
Maximum System Voltage (VDC)	1000 V (TUV/CE/CB/CQC/UKCA)
Series Fuse Rating	25 A
Power & Other Electrical Specification Tolerance	5%

STC: Standard Test Conditions 1000 W/m2 - AM 1.5 - Temperature 25°C

MECHANICAL PROPERTIES	
Module Weight	15.28 kg/m² (variable for different texture)
Dimensions (L x W x T)	1140x570x30mm, 1200x600x30mm, 1254x751x30mm, 1260x746x30mm
Maximum Surface Load (Wind / Snow)	2400 Pa rear & front
Hail Impact Resistance	ø 25mm @ 23.0 m/s
Fire Rating	A
Glass	No
Back support	Aluminium honeycomb composite panel
Cables & Connectors	300mm, 1000mm, 1200mm 4mm²
Front layer	econiclay Coverings (High durability, UV resistant)
Backsheet	econiclay Coverings (High durability, UV resistant)
Bypass Diodes	2 diodes
Junction Box	IP68 rated, TUV certified

TEMPERATURE RATINGS	
Temperature Coefficient Isc	0.036% /°C
Temperature Coefficient Voc	-0.25% /°C
Temperature Coefficient Pmax	-0.30% /°C
Nominal Module Operating Temperature	42 ± 3°C
Operating Temperature	-40°C ~ +85°C

WARRANTY	
Product Warranty: 25 years Performance Warranty:	• ≥ 98% end of 1st year • ≥ 90% end of 12th year • ≥ 80% end of 25th year



eSolarFacade
technical principles

This invention, eBIPV, is based on precise control of the microscopic structure of the covering material, allowing it to guide light to propagate in specific directions while maintaining its opaque characteristics. In practice, after penetrating this specially structured covering material, the light will be absorbed by the internal high-efficiency photovoltaic materials and converted into electrical energy. This process not only significantly improves the energy conversion efficiency of the material but also avoids light pollution in buildings caused by sunlight reflection.

In addition to the unidirectional light-guiding function, the covering material also utilizes a distinctive process to print 3D textures and patterns on the inorganic econiclay (zero-carbon) material. These textures and patterns not only enhance the visual appeal of the covering material but also integrate seamlessly with architectural design, elevating the overall aesthetic value of the building.



eSolarFacade has won
the 123rd Paris International Invention Gold Award,
the 76th Nuremberg International Invention Gold
& Ehrenpreis Award

eSolarFacade successfully addresses the visual art disruption issue caused by
glass BIPV, breaking through its aesthetic limitations. eBIPV products not only
provide more efficient clean energy but also integrate various architectural
decorative styles, significantly reducing carbon emissions from buildings.



Certifications



EU TUV Certification



China CQC Solar
Product Certification



中国质量认证中心
CHINA QUALITY CERTIFICATION CENTRE

China CQC Quality Certification



International
CB Certification



CE certification