Building Envelope Solutions with Energy Saving Glass, BIPV & BAPV

Haneda Airport T2
Japan
SunEwat Vision

October 2025

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- **Company Introduction**
- **Achieving ZEB**
- **Energy Saving Glass**
- **Understanding BIPV / BAPV**
- **BIPV/BAPV Project References**
- **Our Services**

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AGC Group

A worldwide leader in Glass, Electronics, Chemicals, Life Science, Ceramics & Other Materials

¥2,067.6bn
Net Sales

53,700
Employees (est.)

HQ and Stock Exchange in
Tokyo

AGC Glass Asia Pacific

Singapore – Regional HQ

Thailand – AGC Flat Glass, Samut Prakan Plant

3 Float Lines, Mirror, Magnetron Coated Glass, Processed Glass, Sales & Marketing

Indonesia – PT Asahimas Flat Glass TBK, Sidoarjo & Cikampek Plants

4 Float Lines, Interior Glass, Mirror, Pyrolytic & Magnetron Coated Glass, Sales & Marketing

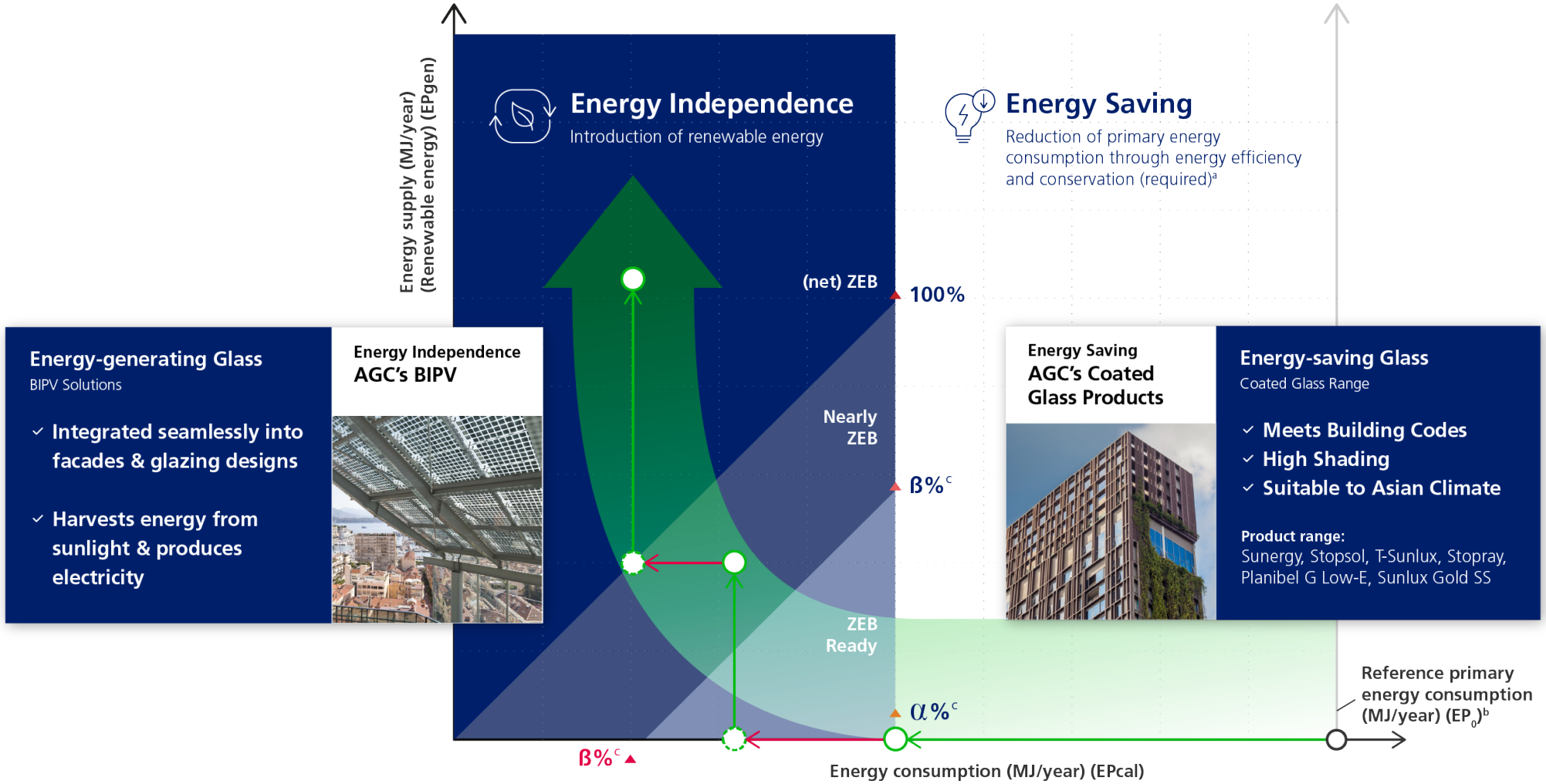
Representative Offices

Hong Kong, Malaysia, Taiwan, Vietnam

Market Coverage

Asia, Oceania

ZEB Concept with AGC's Glass Solutions



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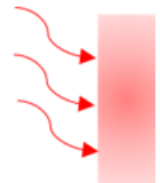
Key Parameters in Glass Evaluation

VLT%

Visible Light Transmission

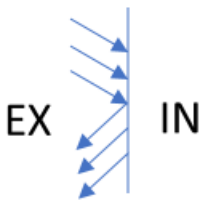
Percentage of visible light passes through. It is a key factor in determining how bright or dark a space or view will appear



EA%

Energy Absorption

Absorption of energy from light or heat, instead of reflecting or transmitting it.



VLR %

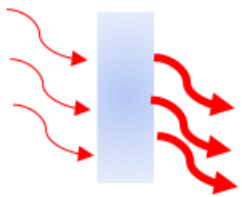
Visible Light Reflection

Bouncing of light waves off surfaces. It occurs in two forms: external reflection and internal reflection

SC, SHGC

Shading Coefficient
Solar Heat Gain Coefficient

Shading Coefficient (SC) is a measure of how much solar heat passes through
Solar Heat Gain Coefficient (SHGC) represents the fraction of solar radiation admitted through glass, both directly transmitted and heat absorbed (lower values mean less heat enters)



DET %

Direct Energy Transmission

Energy transmittance through a material without being reflected or absorbed.

U-Value

U-Value

U-Value often equates to thermal insulation performance, allowing less heat transfer through the material.
Helps reducing the load on the HVAC system and improves overall energy efficiency.

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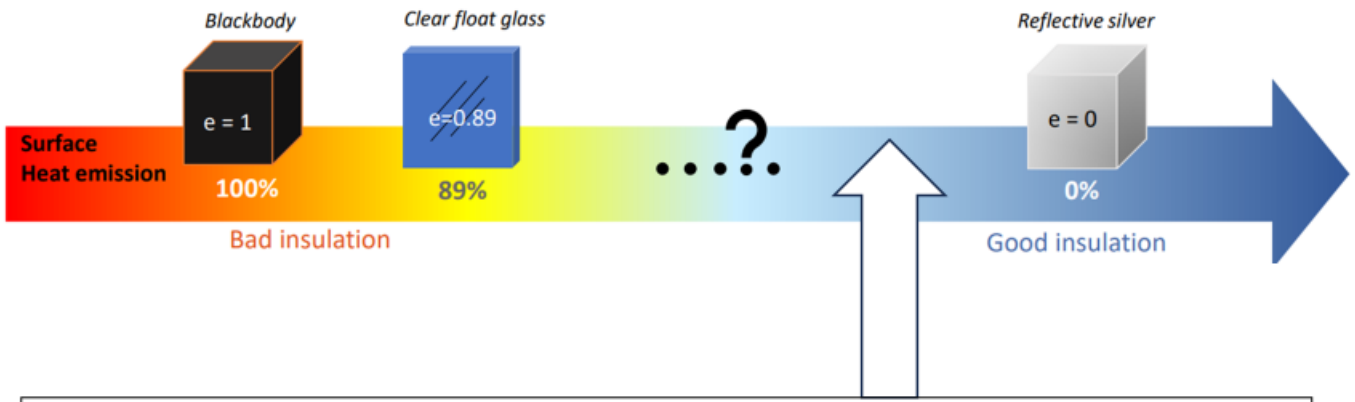
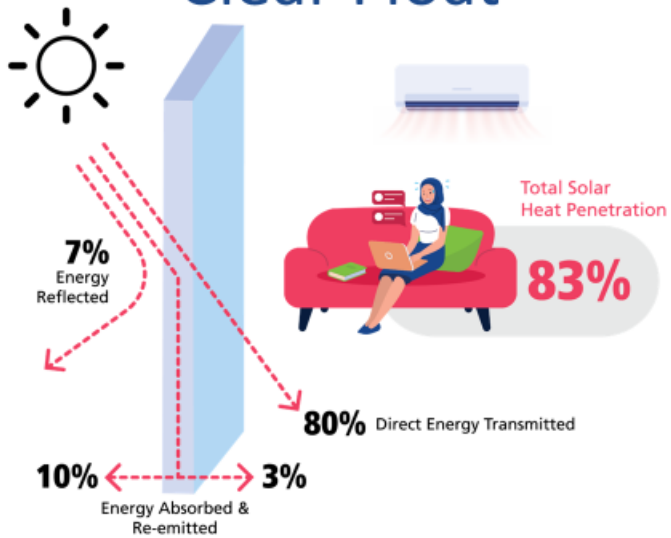
What is Low-E Glass?

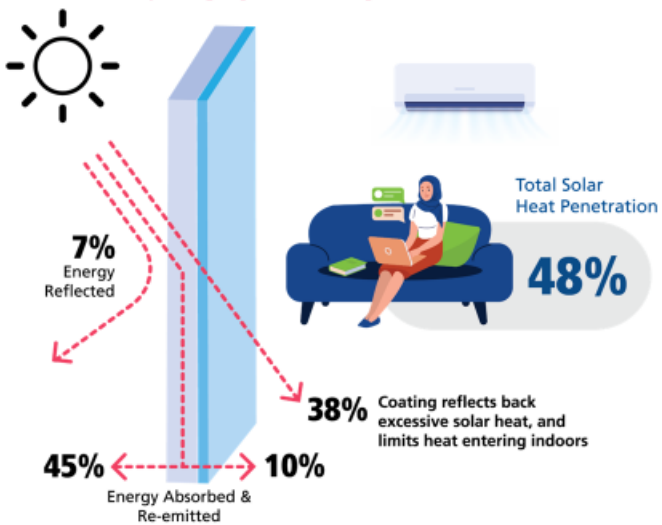


- **Emissivity** is a material property that measures how well a surface radiates energy compared to a perfect emitter (blackbody).
- It ranges from **0** (perfect reflector) to **1** (perfect emitter).
- **Low Emissivity (Low-E) coatings on glass reduce the glass's ability to emit heat.**

Clear Float



Clear Low-E



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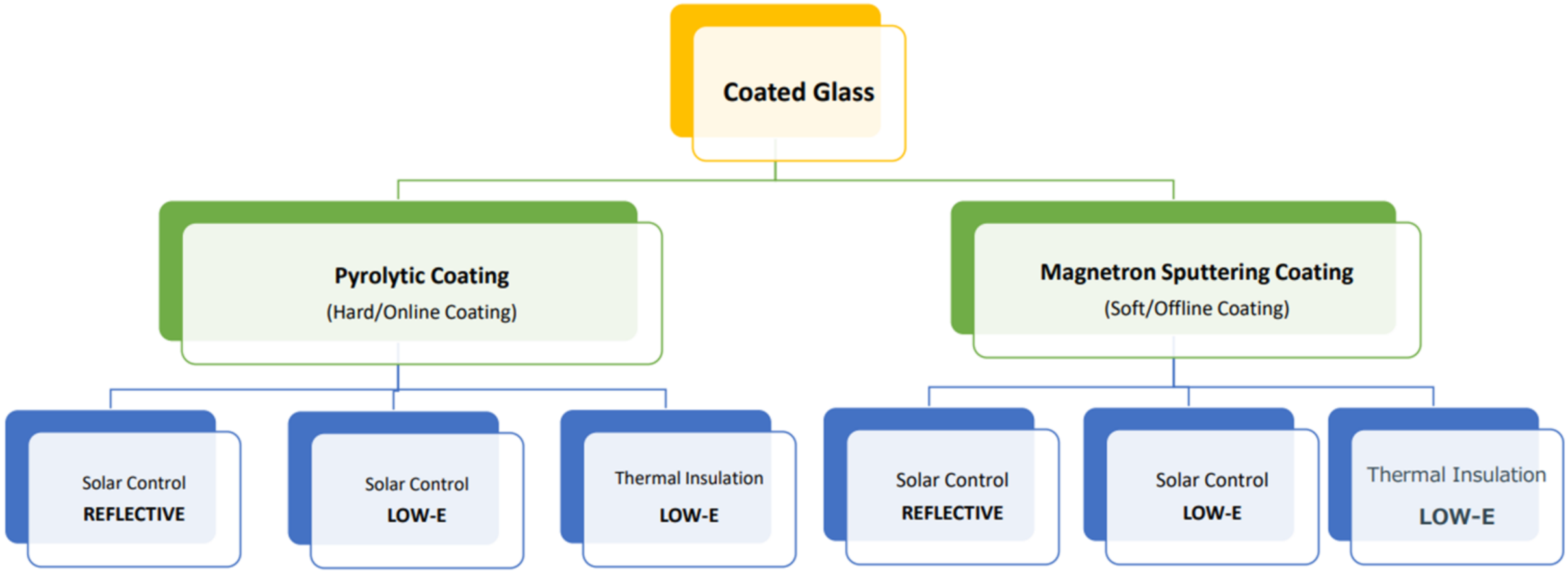
Coated Glass Offerings



Recommended for office when privacy on demand

Generally suitable for both residential and office

Better U-Value, best combination with low-e or tinted

Recommended for office when privacy on demand

Excellent heat insulation with high VLT

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Reference

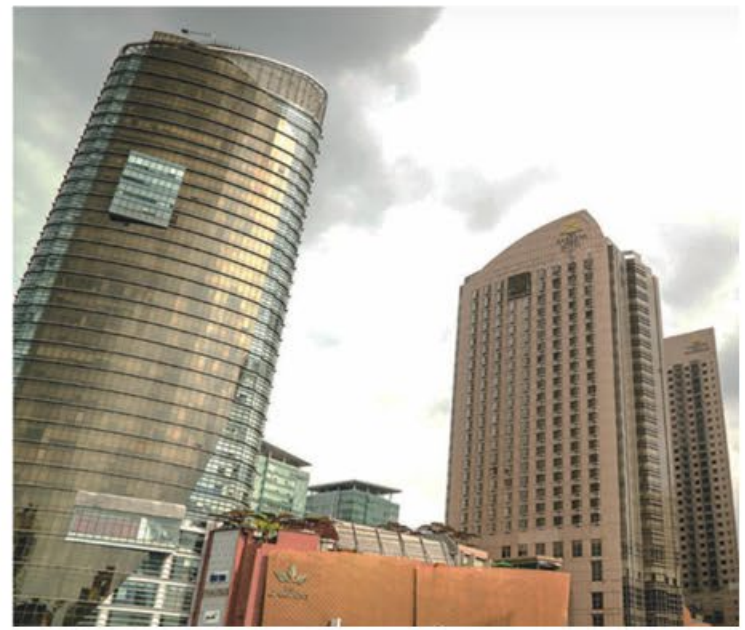
Facade

RTS Johor – SG (Bukit Chagar Station

Sunergy Clear + Planibel-G

UOA – The Horizon Bangsar South

T-Sunlux 214 – Green



IGB Tower - Mid Valley City

Stopsol Classic Bronze & Blue

(Laminated)

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Reference

Facade

Troika , KLCC

Sunergy Clear

KKR2

Stopray Vision 50-T

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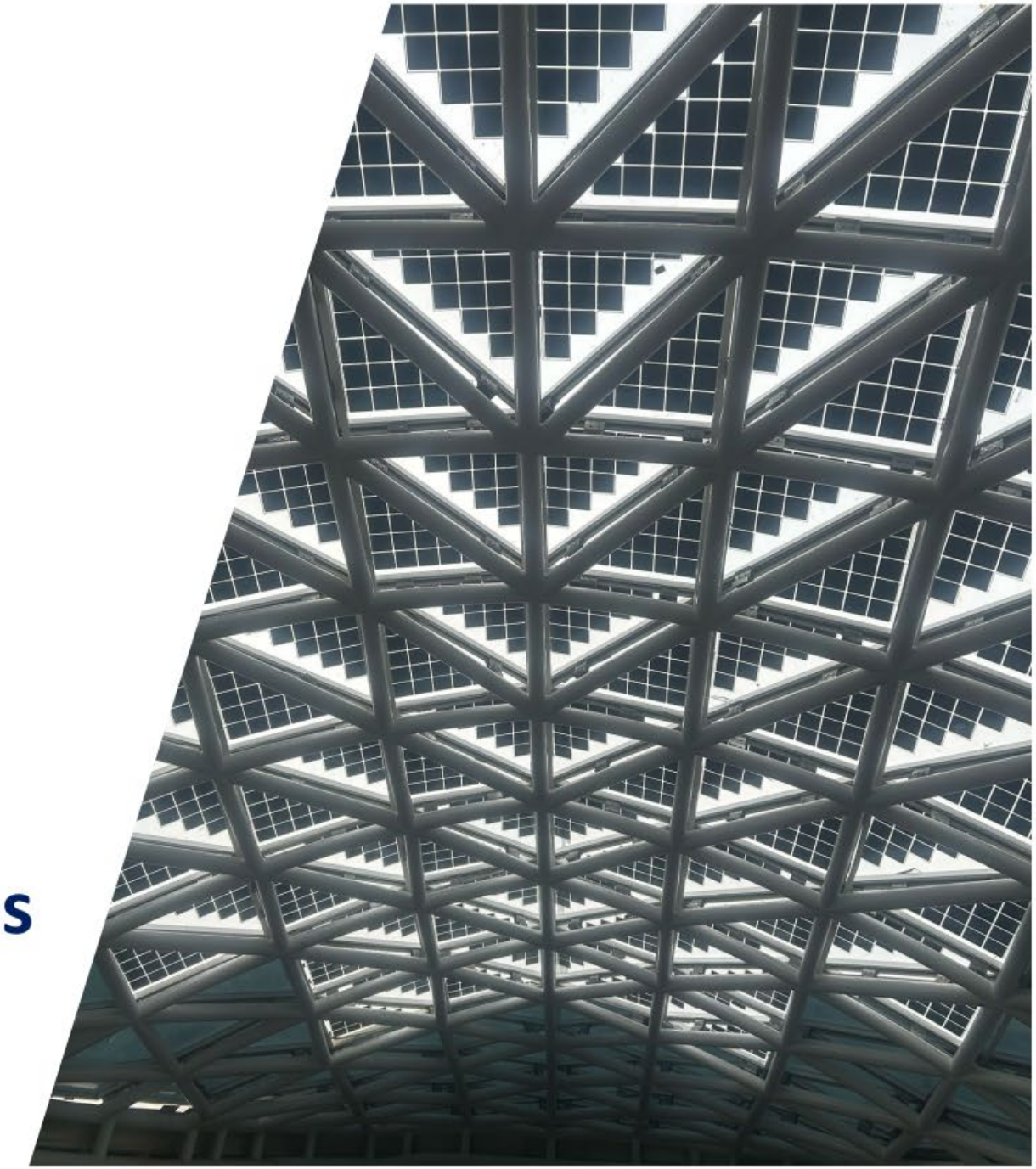

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Why BIPV / BAPV?

- **Integrates seamlessly** with architectural elements.
- **Integrates natural light and clean energy** generation through engineered design.
- **Enhances building appeal**, and promotes eco-friendly practices.
- Solar Cell can be designed as Shading Components
- Efficient solution to reduce ETTV / OTTV for your building.

Image from 9GAG

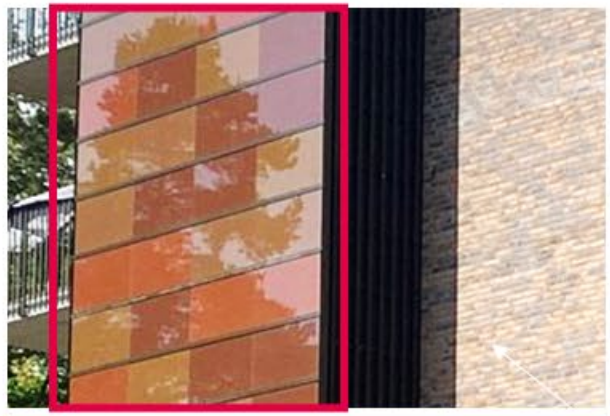
Understanding Various Types of PV

Conventional Solar Panels
Rooftop PV Module Tests

Efficiency	High (20 to 23+%)
Aesthetics	Standardised Panel
Customisation	**No**
Maintenance	Specialised Solar PV Cleaning
Fire Regulation	**1 test requirement**

✓ Fire Regulation based on application instead of product type.

Building-Applied Photovoltaics
Wall Mounted PV Tests



Efficiency	**Medium (16 to 20+%)**
Aesthetics	Monotone Colour or Design
Customisation	**High**
Maintenance	Façade Cleaning
Fire Regulation	**6 test requirements**

Building Integrated Photovoltaics
Wall Integrated PV Tests

Efficiency	**Medium (Max. 19%)**
Aesthetics	Customisable Designs
Customisation	**High**
Maintenance	Façade Cleaning
Fire Regulation	**6 test requirements**

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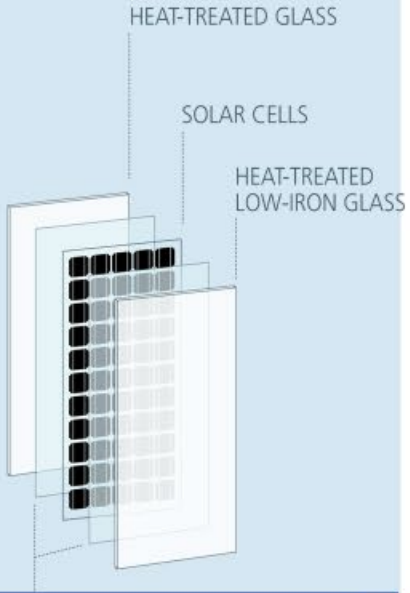
SunEwat Vision

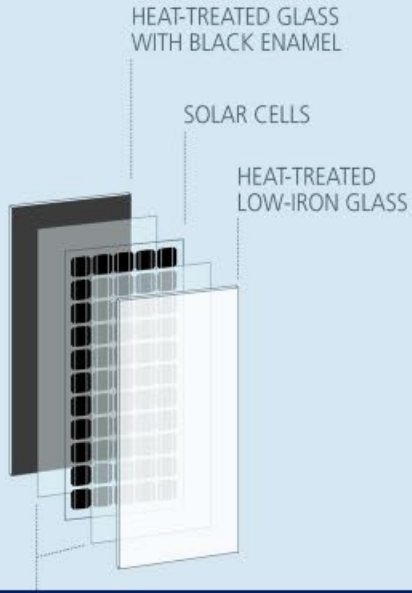
Max 190 Wp/m2



Sanofi Tuas, Singapore

SunEwat Origin

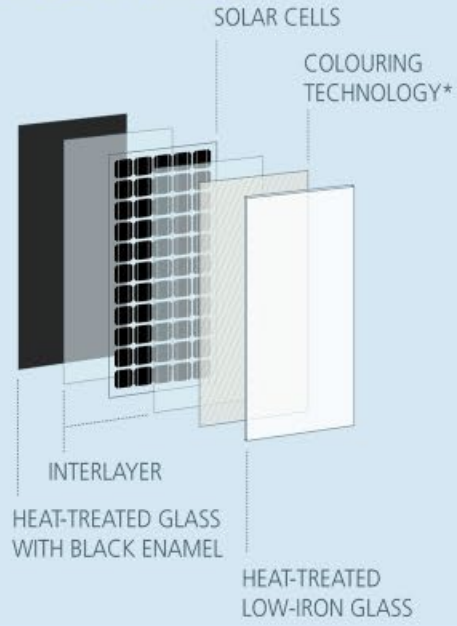
Max 201 Wp/m2

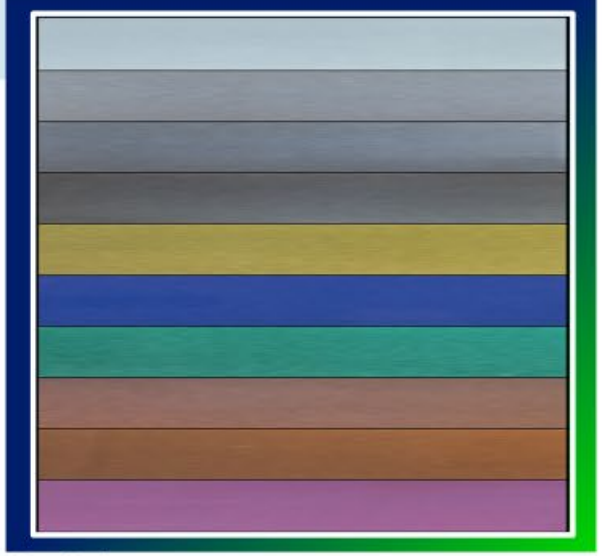



Bold Overhoeks, The Netherlands

SunEwat Colour

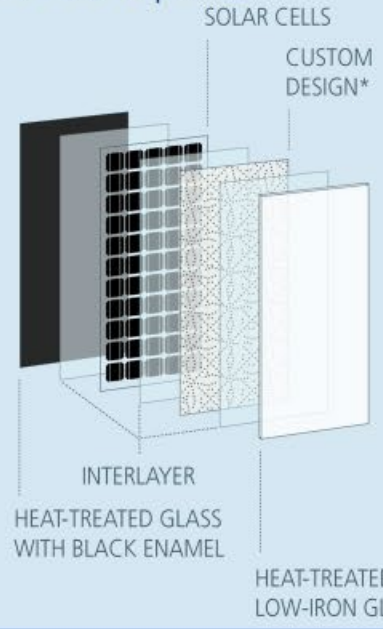
Max 198 Wp/m2

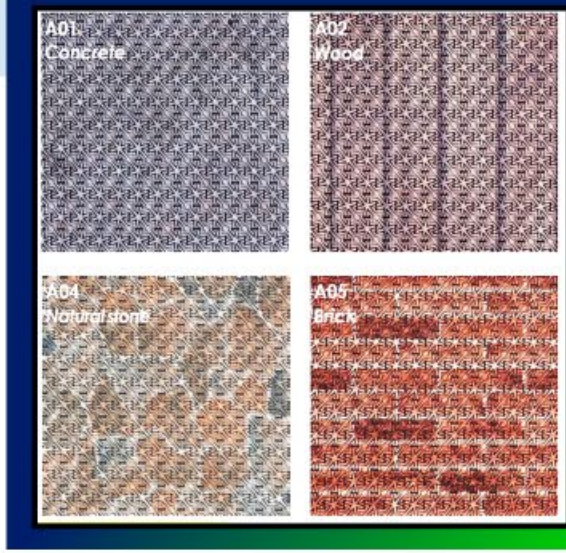




SunEwat Design

Max 150 Wp/m2





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Reference

Skylight

PNB118 Project
Kuala Lumpur

Malaysia

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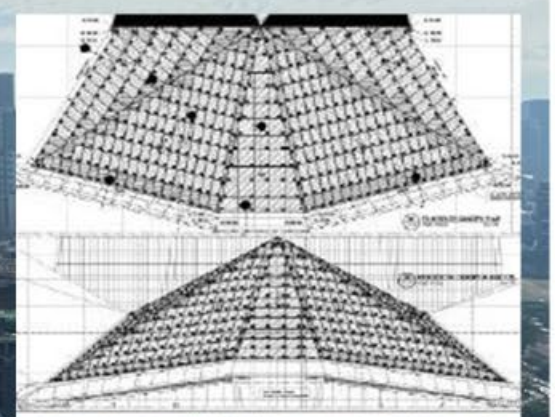
Area supplied: 1050 m²



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Reference

Design, Façades & Canopy

UniKL - Sustainable Energy Living Lab

Malaysia

SunEwat Design
SunEwat Vision

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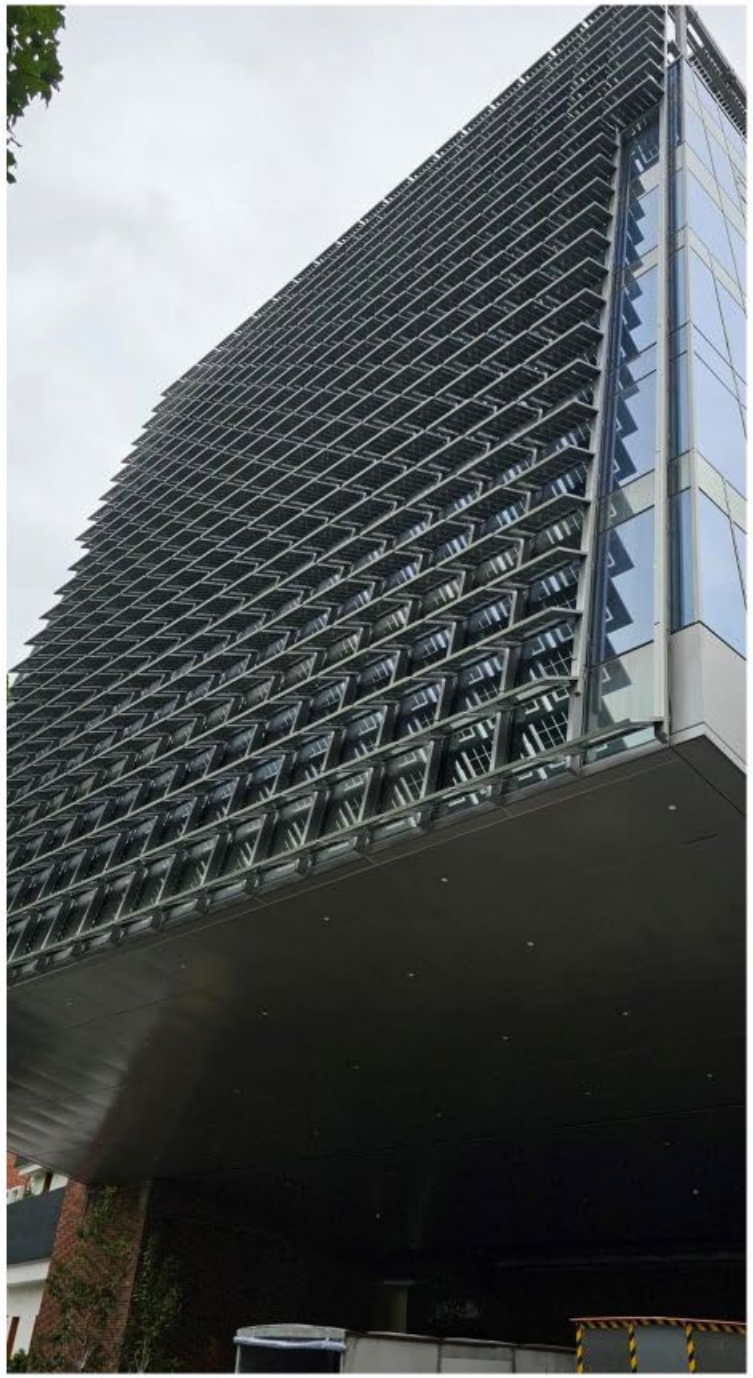
Reference

Skylight and Horizontal Fins

Dulwich College, Singapore

DP Architects

SunEwat Vision



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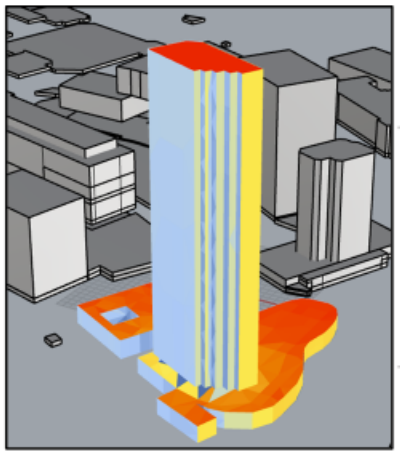
Our Customization Approach



1

Initial Engagement and Project Assessment

Our team will assist with BIPV feasibility studies and design proposals to meet aesthetic or functional requirements.

2

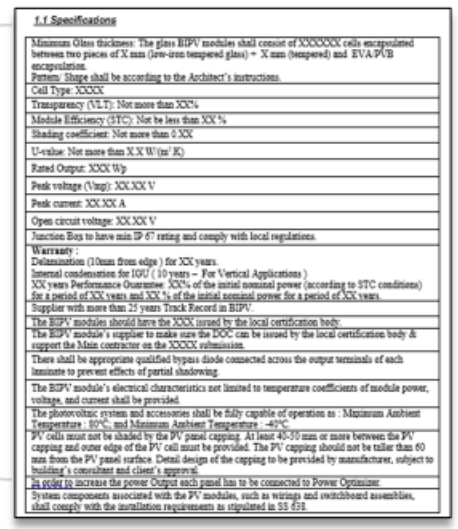
Comprehensive Analysis and Support

We can provide discovery and training about the range of AGC products and services. As each project is unique, we can conduct the required studies, site assessments, technical and specification details to support the integration of BIPV in each building project.

3

Proposal

AGC presents a comprehensive proposal and technical specification for each project.



f. f Specifications

Minimum Glass thickness: The glass BIPV modules shall consist of XXXXXX cells encapsulated between two pieces of X mm (low-iron tempered glass) + X mm (tempered) and EVA/PVB encapsulation. Pattern/ Shape shall be according to the Architect's instructions.
Cell Type: XXXX
Transparency (VLT): Not more than XX%
Module Efficiency (STC): Not be less than XX %
Shading coefficient: Not more than 0.XX
U-value: Not more than X.X W/(m² K)
Rated Output: XXX Wp
Peak voltage (Vmp): XX.XX V
Peak current: XX.XX A
Open circuit voltage: XX.XX V
Junction Box to have min IP 67 rating and comply with local regulations.
Warranty : Delamination (10mm from edge) for XX years. Internal condensation for IGU (10 years – For Vertical Applications) XX years Performance Guarantee: XX% of the initial nominal power (according to STC conditions) for a period of XX years and XX % of the initial nominal power for a period of XX years.
Supplier with more than 25 years Track Record in BIPV.
The BIPV modules should have the XXX issued by the local certification body.
The BIPV module's supplier to make sure the DOC can be issued by the local certification body & support the Main contractor on the XXXX submission.
There shall be appropriate qualified bypass diode connected across the output terminals of each laminate to prevent effects of partial shadowing.
The BIPV module's electrical characteristics not limited to temperature coefficients of module power, voltage, and current shall be provided.
The photovoltaic system and accessories shall be fully capable of operation in : Maximum Ambient Temperature : 80°C, and Minimum Ambient Temperature : -40°C
PV cells must not be shaded by the PV panel capping. At least 40-50 mm or more between the PV capping and outer edge of the PV cell must be provided. The PV capping should not be taller than 60 mm from the PV panel surface. Detail design of the capping to be provided by manufacturer, subject to building's consultant and client's approval.
In order to increase the power Output each panel has to be connected to Power Optimizer.
System components associated with the PV modules, such as wirings and switchboard assemblies, shall comply with the installation requirements as stipulated in SS 638.

4

Engage with Contractors and Installers

Our team works closely with contractors and system installers, ensuring the installation processes are executed efficiently and smoothly.

5

Installation and Commissioning

AGC oversees the installation and commissioning of the BIPV system, by providing technical expertise, knowledge and skills. AGC strives to meet the highest standards of quality and performance to ensure a successful project completion, according to the requirements and specification.

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For more information, please contact:

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