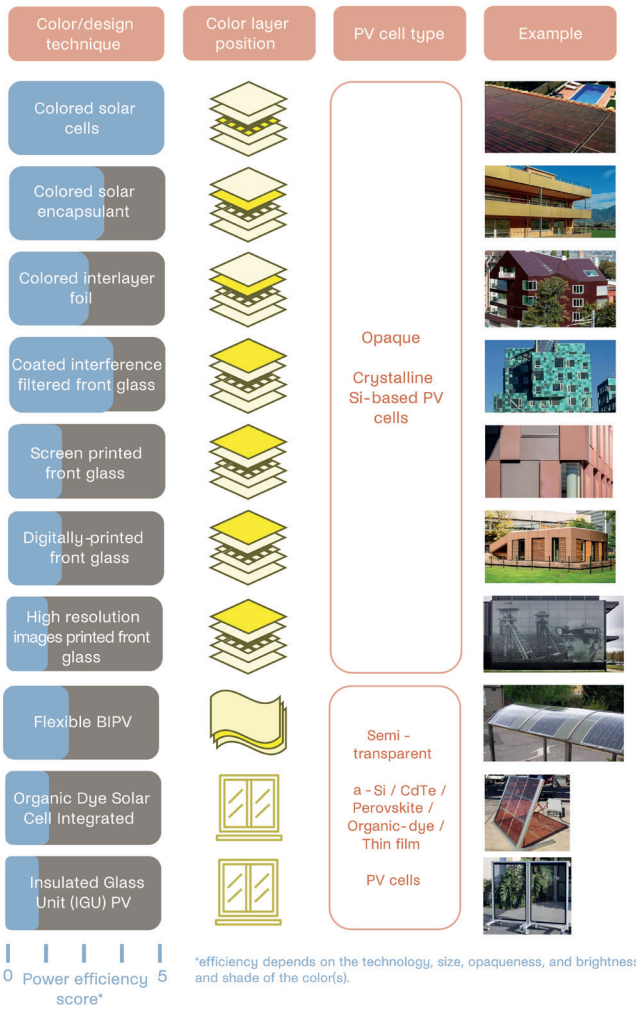
Factsheet

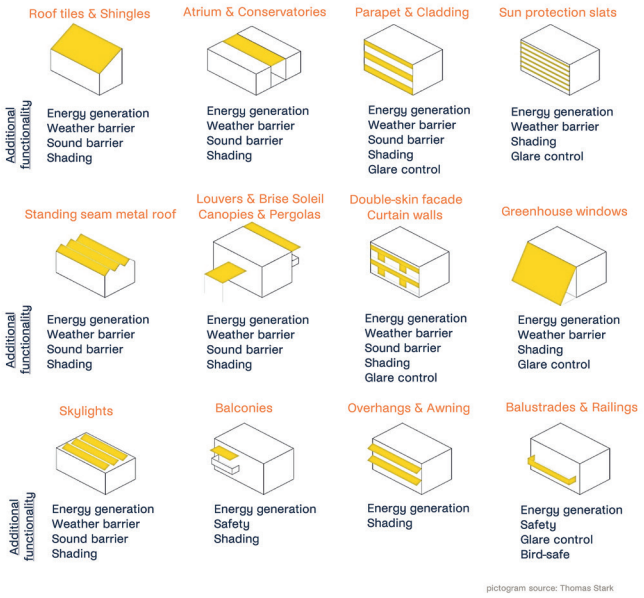
BIPV Factsheet for Policymakers and Regulators:

From Facade to Function in Europe's Clean Energy Transition

Depending on the technology, the energy generation aspect of photovoltaic modules can be used to create distinctive urban designs, blend with the environment, or retrofit historical buildings while preserving their historical values.



A BIPV module can replace the following building elements and takes its mechanical functionality.



PV and construction perspective of BIPV- source: Büşra Yılmaz Depondt[1234]

BIPV Manufacturers in Europe[5]*:

3S Swiss Solar Solutions, Aleo Solar, Asca, Autarq, Avancis, AxSun Solar, BIPVco, Brandoni Solare, DAS Energy, Dyaqua, Eclipse Italia, Edilians, ElectroTile, Ennogie, Ernst Schweizer, Ertex, Fly Solartech Solutions, Freesuns, Heliatek, Innos, Intelligent Solar, Invent, Izpitek Solar, Kameleon Solar, Viridian Solar, Megasol Energie, MetSolar, ML System, OET - Organic Electronic Technologies, Onyx Solar Energy, Pixasolar, Polysolar, Saule Technologies, Solar Cloth System, Solar Innova, Solarstone, Solartag, Solbian, Solinso, SoliTek, Soltech, Soluxa, Sottile Solar, Sunage, Sunerg Solar Energy, Sunovation, Sunspeker, SunStyle, Swisspearl Group, Terran Rooftile Manufacturer, Trienergia, ViaSolis, Solskin

1 *International Energy Agency – PVPS. (2025). Building-integrated photovoltaics: A technical guidebook.*
2 *(2023). Aesthetic and functional aspects of BIPV – An architectural outlook. https://doi.org/10.37705/TechTrans/e2023010sra*
3 *(2024). Colouring solutions for building integrated photovoltaic modules: A review. https://doi.org/10.1016/j.enbuild.2024.114253*
4 *Faes, A., Virtuani, A., Quest, H. et al. Building-integrated photovoltaics. Nat. Rev. Clean Technol. 1, 333–350 (2025). https://doi.org/10.1038/s44359-025-00059-9*
5 *SUPSI - ISAAC - BIPV Research Team, Corti, P., Bonomo, P., & Frontini, F. (n.d.). Building integrated photovoltaics: A practical handbook for solar buildings' stakeholders.*

Motives for Adoption of BIPV in Urban Environment:

Grid Relief & Energy Resilience

- BIPV enables local generation at the point of use, reducing losses and alleviating grid congestion, especially in dense cities.
- Self-consumption from BIPV reduces peak load stress and increases resilience of critical public services (e.g., schools, hospitals, municipal buildings).
- According to the IEA (2023), widespread adoption of rooftop and façade PV in cities could reduce urban distribution bottlenecks by up to 25% in congested areas. [6]

Net Zero Energy Transition

- BIPV plays a key role in meeting NZEB requirements under the Energy Performance of Buildings Directive (EPBD).
- Façade and rooftop-integrated PVs can deliver up to 30–60% of building electricity demand, depending on orientation and efficiency. [7]
- Renovation of EU public buildings is a major focus of the Renovation Wave, and BIPV can address both energy and aesthetic upgrades simultaneously.

EU Alignment with EU Energy & Climate Goals

- BIPV contributes directly to:
  - REPowerEU's goal of doubling rooftop solar capacity by 2025
  - The Fit-for-55 target of a 55% emissions reduction by 2030
  - National Energy and Climate Plans (NECPs) requiring rapid deployment of distributed renewables
- BIPV enables solar on non-traditional surfaces like façades, skylights, and even acoustic barriers expanding usable solar surface area by up to 50% in cities

Environmental Impact & Land Efficiency

- BIPV is land-neutral — it generates clean energy without additional land use, avoiding land conflicts in urban and peri-urban areas. [8]
- BIPV installations consistently reduce annual CO_2 emissions by 245–425 kg per kWp, depending on façade orientation and year. Systems installed at optimal tilt and azimuth achieve up to 591 kg/kWp/year in emission reductions (measured between 2018-2023 with 1 kWp installation in The Netherlands). [9]
- Supports urban biodiversity and compact planning by reducing the need for ground-mounted solar panels.
- Fully aligned with the New European Bauhaus (NEB): combining sustainability, aesthetic value, and inclusivity in design.

Strengthening European Industry & Supply Chains

- The EU currently imports over 90% of its solar modules, mainly from Asia [EU Solar Strategy, 2022]
- The Net-Zero Industry Act (NZIA) sets a target of 40% EU manufacturing capacity for clean technologies by 2030.
- The EU Solar Charter and Solar PV Industry Alliance aim to establish 30 GW of EU-based solar production capacity, which BIPV can strongly support — especially with high value-added façade-integrated systems.

Photo: Manny Becerra, Unsplash.com

[6] *International Energy Agency (IEA). (2023). The role of distributed solar in grid decarbonization. https://www.iea.org/*
[7] *Energy & Buildings (2025), Vol. 328, 115010, https://doi.org/10.1016/j.enbuild.2024.115010*
[8] *Gholami, H., & Røstvik, H. N. (2020). Energy, 204, 117931.*
[9] *Energy & Buildings. (2023). Vol. 328, 112948, https://doi.org/10.1016/j.enbuild.2024.115010*

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Policy Challenge and Opportunities:

Non-Price Criteria (NPC)

To support industrial resilience and sustainability, BIPV projects can be prioritized through qualitative criteria, including:

- Carbon footprint (<550 gCO_2/kWp as per EcoDesign proposal)
- Traceability of origin (e.g., European value chain stages)
- Recyclability and use of non-toxic materials (e.g., halogen-free, lead-free, antimony-free)
- Social compliance (forced labour ban under EU regulation, 2024)

NZIA Articles 25–28 allow Member States to include NPC in public tenders, offering bonus points or eligibility thresholds for sustainable and resilient technologies.

Public Procurement Leverage

Example: The French CRE auction system offers sustainability bonuses for systems with domestic manufacturing or certified ESG compliance.

- National and municipal procurement can include BIPV as a requirement or bonus criterion in new buildings or deep renovation tenders.
- Dedicated BIPV or "resilience auctions" with EU content or ESG-based bonuses are being piloted in Member States (e.g., France, Germany).
- Proposed auction design: up to 15% cost bonus for meeting resilience criteria (EU manufacturing, circular design, etc.).

Incentive Integration

Example: Austria provides a BIPV bonus of up to 150€/kWp on top of standard rooftop PV support.[10]

- BIPV is eligible under:
  - RePowerEU, Recovery and Resilience Facility (RRF), and national support programs
  - Green bonds and tax-based incentives
  - Specific national BIPV bonuses (e.g., in Austria and Switzerland)
- Integration into deep renovation schemes (aligned with the Renovation Wave and Energy Efficiency Directive) boosts viability.

Regulation & Standards

EN 50583 (updated 2023) classifies BIPV modules as both construction elements and electrical products, requiring:

- EU fire safety compliance
- Electrical safety conformity
- Structural integrity

Upcoming revisions offer the chance to integrate:

- Circularity benchmarks
- PV Passports and digital product documentation
- Unified traceability for public procurement [11]

BIPV is not only a technical solution, but a policy tool ready to deliver Europe's climate, energy, and industrial goals. With dedicated support, BIPV can be scaled as a visible symbol of the Green Deal on every street and skyline.

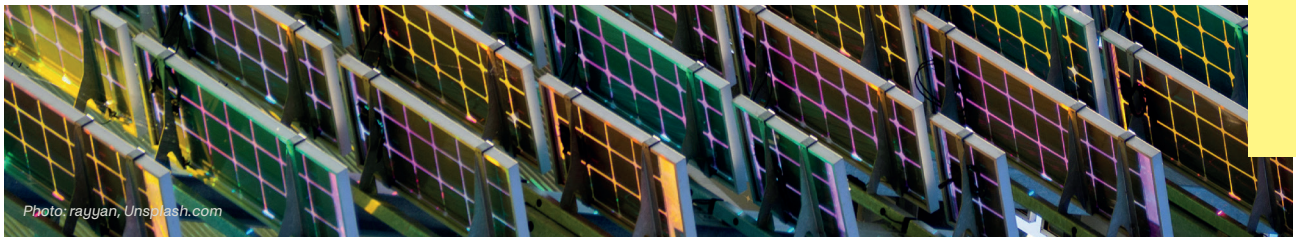

Photo: rayyan, Unsplash.com

[10] *Austrian Climate and Energy Fund. (2024). PV Bonusprogramme 2024.*
[11] *IEA PVPS Task 15. (2024). Advancing BIPV standardization: Addressing regulatory gaps and performance challenges (Report IEA-PVPS T15-24:2024).*

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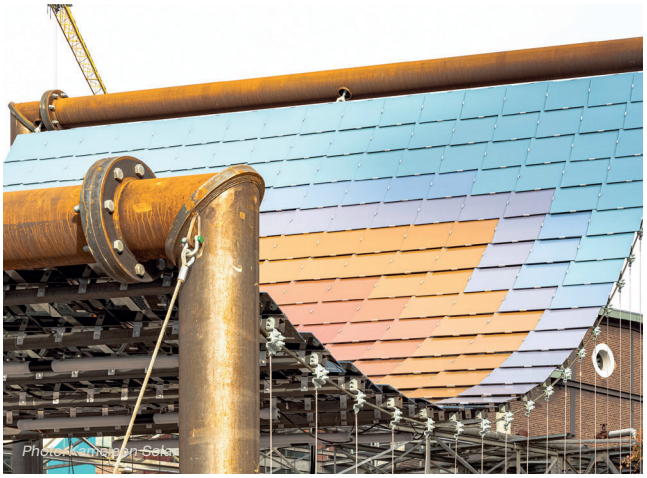
*Disclaimer: This list of European BIPV manufacturers has been compiled based on the available data at the time of publication. While efforts were made to ensure its accuracy and comprehensiveness, the list may **omit certain active manufacturers** or **include companies that are no longer operating in the market**. The rapidly evolving nature of the BIPV industry means company statuses and offerings can change over time. Users are encouraged to verify the current status and details of each manufacturer independently before making any business or technical decisions based on this information.



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