University of Applied Sciences and Arts
of Southern Switzerland
SUPSI

2025
Solar building materials

European manufacturers: trends and opportunities for governments and public institutions

March 2026

Introduction

The Green Deal Industrial Plan, adopted by the European Commission, aims to enhance the competitiveness of Europe's net-zero industry to reinforce the solar sector in Europe and facilitate the transition to climate neutrality. This includes the promotion of new products for the building sector by emphasizing the use of renewable energy, energy efficiency, and sustainable design. Despite globalization, the construction sector remains dominated by local firms and practices, making it challenging for international companies to penetrate at a granular level. This plays a role in the solar building material industry, which favors customization and flexibility over standard and mass-market options, but also for those stakeholders and the value chain that are looking for innovation and new products to offer to the market.

Although information about photovoltaic manufacturers is readily available, information regarding manufacturers of solar building materials is scarce. The following short report aims to provide an overview and identify trends about solar building material manufacturers in Europe to favor the sector's development, and identify opportunities for government agencies, public institutions, investors, and manufacturers themselves. The first part of the report presents an overview of the European hub for solar material production, by identifying a picture on the current situation, regional experiences and key players. The second part of the report showcases policies and financial schemes that supported and will support solar architecture in the following years. The data collected have been aggregated to ensure the anonymity of each manufacturer.

Disclaimer: although the identification of BIPV manufacturers has been validated by many European partners, research institutes, and industry, we recommend using these estimates with caution and considering them for what they are for this report's scope: a tool to describe and understand the ongoing meta-trends on the European BIPV market.

About SUPSI

The Innovative Envelope team specializes in energy efficient building envelopes and solar building materials, serving as Switzerland's competence center for BIPV (see www.solarchitecture.ch for more). The team focuses on applied research, developing and testing multifunctional photovoltaic products that generate renewable energy while fulfilling architectural roles such as solar control, thermal protection, and waterproofing.

Key market activities include:

- Complex construction data into actionable intelligence, guiding governments, real estate, and manufacturers toward opportunity, competitiveness, and long-term market advantage.
- Tailored studies and publications, transforming raw data into clear strategic insights that support innovation and effective decision-making in the construction sector.
- Value chains, cost, and business models to reveal opportunities, maximize returns, reduce risk, and benchmark competitiveness.

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Photo: Solares Direktgewinnhaus. Credits: Yufei He / BUK ETHZ

Highlights

Over 50% of the market in France, Spain, Austria, Poland, Lithuania, and Switzerland **focuses on façades and external integrated devices**, while in other countries the majority is concentrated on rooftop PV systems.

Year 1991

First documented company entered in the solar sector. Northern European manufacturers host the youngest solar manufacturers, while Germany, Austria and France host the oldest

>50%

Solar manufacturers located in Italy, Switzerland, Netherlands and Germany

2’500 employees

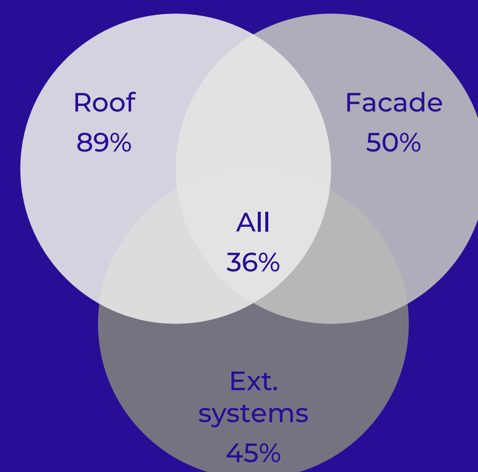
Approximately have been identified working for solar construction manufacturers in Europe.

7

Solar production lines located in the Germany. In Austria 6, in Italy and in Switzerland 5. Only 2 in the Netherlands.

Image: Verkehrsstützpunkt Kapo Chur. Credits: Yufei He / BUK ETHZ

Solar technological systems distribution by European manufacturers



Methodology

Research and validation

Solar building material manufacturers' data and information have been collected through an extensive review of procurement process data from international reports (SUPSI [1-2], IEA [3], etc.), SUPSI data repository of published reports, specialized solar platforms and databases (www.solarchitecture.ch, www.eurac.edu, EUROSTAT, etc.), online research, articles from recognized authors, and data collection based on the team's experience in the construction and photovoltaic sector. It helped to provide an overview of the existing framework and to identify a preliminary picture of the available manufacturer presence in Europe. After this initial research, the data collected have been validated through a feedback process and revision conducted via interviews and surveys with key European stakeholders, manufacturers, and research institutes, which provided their input to optimize the research. The research was conducted between July and August 2025.
After analyzing the information, the data collected has been categorized in an internal database by:

- Country in which the headquarters and the production line are located
- Year of foundation (and eventual year of termination)
- Manufacturer by activity
- Number of employees
- Cladding type of application
- Cladding technological system
- Renovation rate and building permits by country

Understanding the framework of solar building material manufacturers, the database was analyzed, and numerical attributes were placed in aggregate and completely anonymous form to generate visual results, statistical assessment, and to define the market structure.

Additional information regarding the past and active supporting schema for manufacturers in Europe has been collected by analyzing country-specific databases, European reports, and publicly available studies.

Solar material manufacturers' selection criteria

The selection criteria for solar building material manufacturers required that the companies selected had their headquarters in a European country and carried out at least part of their production activities in Europe. In this context, a solar building material manufacturer is defined as the producer of finished building-integrated photovoltaic (BIPV) products (e.g., BIPV modules, BIPV prefab systems) and/or functional/aesthetic semi-finished products for BIPV modules (e.g., aesthetic film for BIPV modules, printed glass).

Photo: Fehlmann Areal II. Credits: Yufei He / BUK ETHZ

Research institute involved:

SUPSI (CH)

TNO (NL)

EURAC (IT)

Fraunhofer (DE)

European hubs for solar material production

Unlike traditional photovoltaic module producers or building material manufacturers, solar building material manufacturers must have in-depth knowledge and expertise in both the solar industry and the building sector. The market expects them to build trust by demonstrating the value of their projects, providing adequate guarantees and support, and having a reliable partner or an excellent value proposition, in addition to financial stability [1]. The following chapter shows a classification of 92 solar building material manufacturers that have been identified in Europe, an overview of their geographical distribution, and their production sites.

Based on data from the 92 active companies identified in Europe, Exhibit 1 shows that Italy, Switzerland, the Netherlands, and Germany account for approximately 50% of all BIPV manufacturers in Europe. However, the same graph shows that Switzerland, Estonia, and Lithuania are the European countries with the highest rate of solar building material manufacturers per capita, with approximately 1.4 manufacturers per million inhabitants. Germany and Italy are in 10th and 9th place, respectively, with a rate of 0.11 and 0.22 manufacturers per million inhabitants.

Exhibit 1: Manufacturers by country

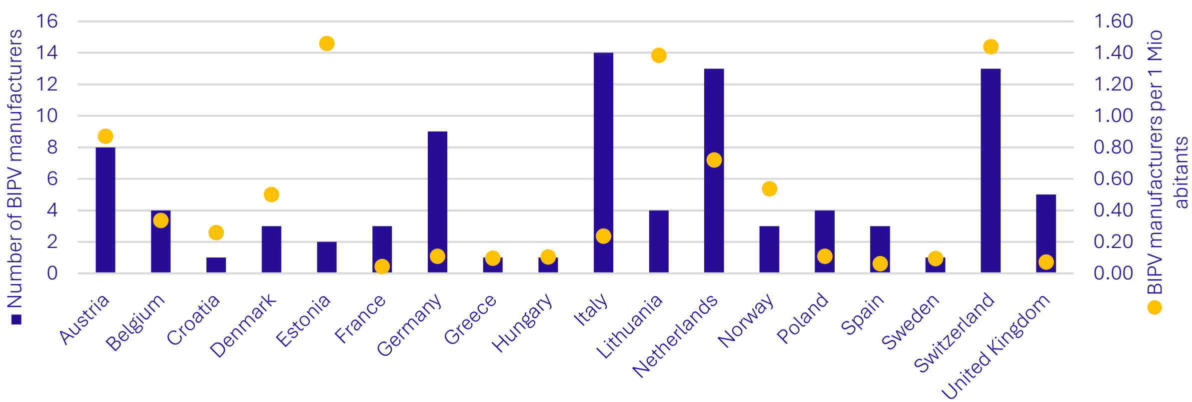
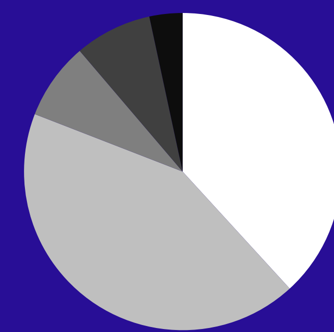


Exhibit 2: Manufacturers by typology



- **End product – assembly**: BIPV module assembled with a standard component for buildings (38%)
- **End product – lamination**: BIPV module (42%)
- **Semifinished – glass processing**: aesthetic processing of the glass (e.g. digital printing, aesthetic films) (8%)
- **Semifinished – cells manufacturing**: manufacturing of cells for BIPV products (e.g. c-Si, thin film, a-Si) (8%)
- **BIPV Original Equipment Manufacturers (OEM)**: support for the design of BIPV modules (4%)

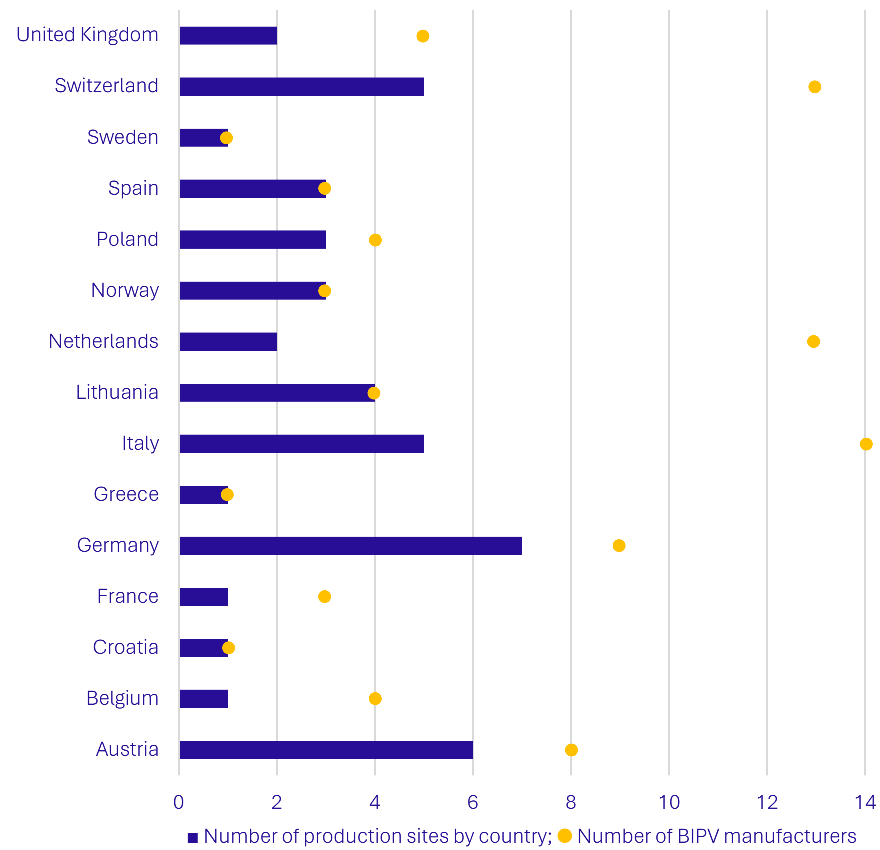
European hubs for solar material production

A key requirement for solar manufacturers is the commitment to sustainability, presented as the ability to provide product declaration statements, life cycle analysis, and reliable environmental data of the products. In this sense, local producers are prioritized in these kinds of projects.

Exhibit 3 showcases production sites, considering only those manufacturers that execute a BIPV lamination (“End product - Laminate”) and/or produce cells (“Semifinished – Cells Manufacturing”). Germany is the European leader with 7 production sites, followed by Austria with 6 production sites, Italy, and Switzerland (5).

An analysis of building permits and renovation rates, two key construction-related factors, reveals that France, the European country with the highest number of permits issued in terms of useful floor area (63 million m2), presents a potentially favorable situation for integrating solar building materials. However, in France, few local system manufacturers are available. The same applies to Spain (34.7 million m2) and Poland (40.8 million m2). In Italy, on the other hand, there are several BIPV manufacturers, even though the annual amount of useful floor area subject to building permits is limited (13 million m2). Exhibit 4 (next page) shows the renovation rate for residential buildings in various countries. In this case, in Italy (17.4%), but also in Belgium (21.4%), Croatia (18.8%), and Sweden (14.8%), the renovation rate is higher than the European average. In France, for example, the renovation rate is 6%. It should be noted, however, that the data on the renovation rate refer to the period 2012-2016, and no more recent data have been found (Exhibit 5).

Exhibit 3: Production sites by country



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European hubs for solar material production

Exhibit 4: Manufacturers and building permits by country

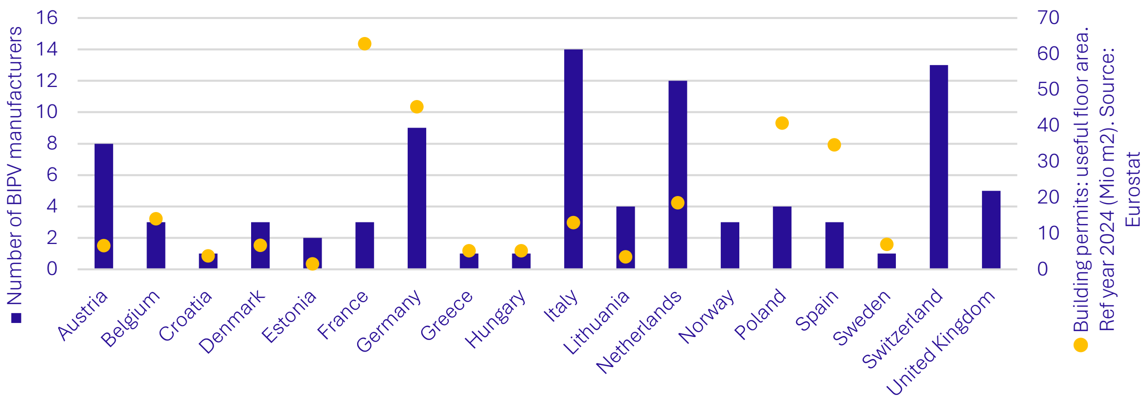


Exhibit 5: Manufacturers and residential buildings renovation rate by country

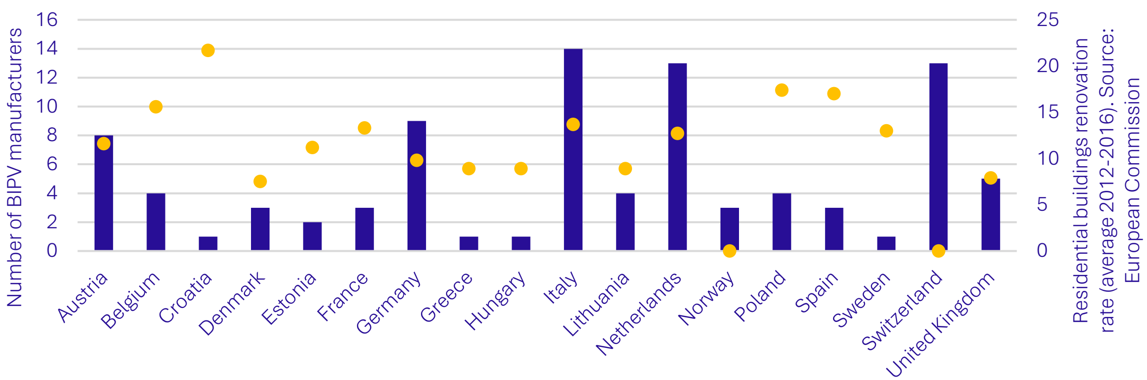


Photo: Solarfaltdach ARA Bassersdorf.
Credits: Yufei He / BUK ETHZ

> “
>
> Germany is the European leader with 7 production lines located in the country

Key industry players

A high level of expertise is required from manufacturers to ensure reliability and minimize risks throughout the solar construction process. This includes a deep understanding of product performance, testing, certification, and innovation, as well as the ability to manage costs and risks, thereby earning trust from stakeholders. In this sense, a long track record in the sector can strengthen both technical skills and brand reputation. However, even young or relatively new manufacturers have brought in seasoned professionals from the research and construction sectors to secure the necessary level of expertise.

Exhibit 6 illustrates the year in which BIPV manufacturers began and, in some cases, ended their solar activities. Exhibit 7 shows the average lifespan of BIPV companies for each European country of reference. Only countries with at least three active manufacturers at the time of writing this report are represented. The following analysis does not include manufacturers for whom it was not possible to identify a start date for BIPV activities. A total of 94 BIPV companies were considered, of which 17 are no longer in business.

With the first manufacturer established in Europe in 1993, still in business today, the BIPV sector began to emerge as an autonomous and evolving technological field. Over the following years, the number of companies grew steadily year after year, peaking between 2007 and 2012, when up to 10 new companies were registered annually. Between 2007 and 2011, there was also significant growth in the BIPV market in Europe, which rose from an annual installed capacity of 80 MWp to 2171 MWp (Exhibit 6).

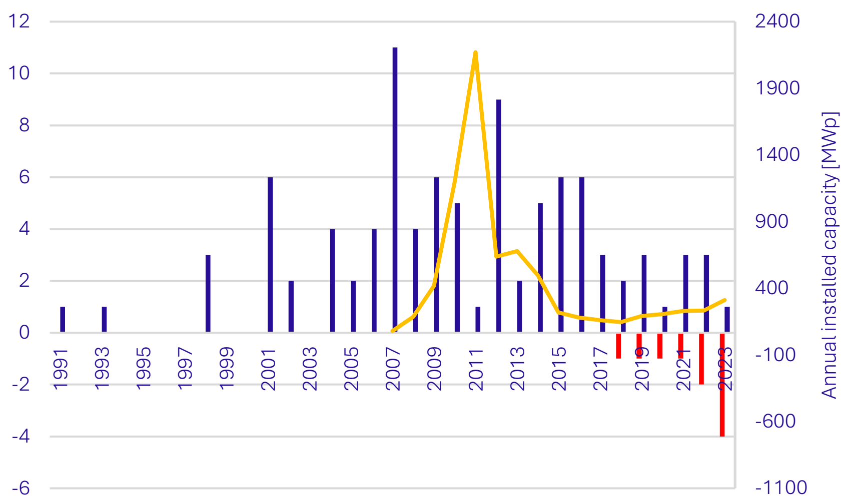
At the European level, the years with the most significant development of BIPV companies occurred between 2007 and 2012, with 12 new companies listed. Since 2018, there has been a slowdown in the development of new activities and an increase in the number of companies that have ceased operations. However, recent years have brought a recovery in the BIPV market installed capacity, following the negative peak in 2018. In 2018, installed capacity was 147 MWp, compared to 313 MWp in 2023 [1, 2].

Photo: Haus in St. Antönien. Credits: Yufei He / BUK ETHZ

Key industry players

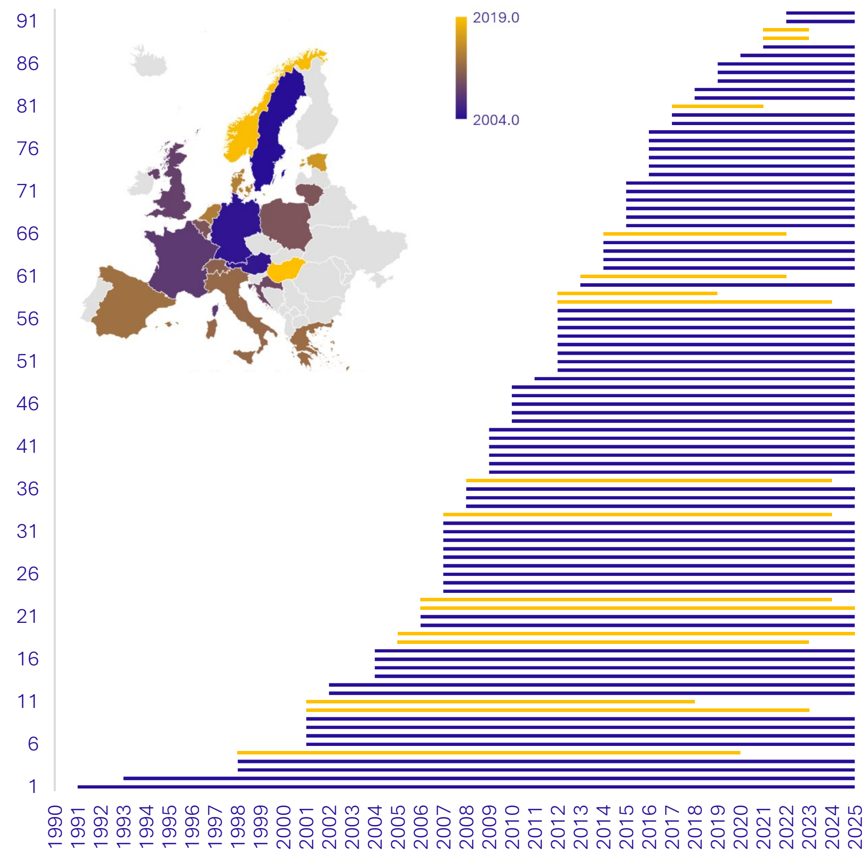
At the regional level, Germany and Austria are the countries with the longest-standing solar material manufacturers in Europe, still in activity, with an average lifespan of about 21 and 20 years, respectively. The first German manufacturer to deal with solar material, documented in this report, dates to 1998, while the first Austrian company entered the sector in 1991. Norway, followed by Denmark and the Netherlands, is the country with the youngest BIPV companies, with about 6, 11, and 12 years, respectively.

Exhibit 6: BIPV manufacturers by year & annual installed capacity



■ Market entry; ■ Market exit; — BIPV annual installed capacity

Exhibit 7: BIPV manufacturers activity. In the map, the average foundation year



Key industry players

Manufacturer	Website
DAS Energy (AT)	www.das-energy.com
Ertex Solar (AT)	www.ertex-solar.at
Sonnenkraft (AT)	www.sonnenkraft.com
MGT-esys (AT)	www.mgt-esys.at
PREFA Aluminiumprodukte (AT)	www.prefa.at
Sunplugged (AT)	www.sunplugged.at
Lenzing Plastics (AT)	www.lenzing-plastics.com
SST Energy (AT)	www.sst-energy.com
Smartroof (BE)	www.smartroof.be
Active Glass (BE)	www.agc-activeglass.com
Soltech NV/SA (BE)	www.soltech.be
Solvis (HR)	www.solvis.hr
SolarLab (DK)	www.solarlab.global
Solartag (DK)	www.solartag.eu
Ennogie ApS (DK)	www.ennogie.com
Solarstone (EE)	www.solarstone.com
Roofit.Solar (EE)	www.roofit.solar
Edilians (FR)	www.edilians.eu
S'Tile (FR)	www.enfsolar.com
Solar Cloth System (FR)	www.solar-cloth.com
Antec Solar (DE)	www.antec-solar.de
Heliatek (DE)	www.heliatek.com
Sunovation (DE)	www.sunovation.de
Aleo Solar (DE)	www.aleo-solar.com
Kalzip (DE)	www.kalzip.com
Asca (DE)	www.asca.com
Autarq (DE)	www.autarq.com
Premium Solarglas (DE)	www.premium-solarglas.com
AxSun Solar (DE)	www.axsun.de
Organic Electronic Technologies (GR)	www.oe-technologies.com
Terran Rooftile Manufacturer (HU)	www.terranroof.com

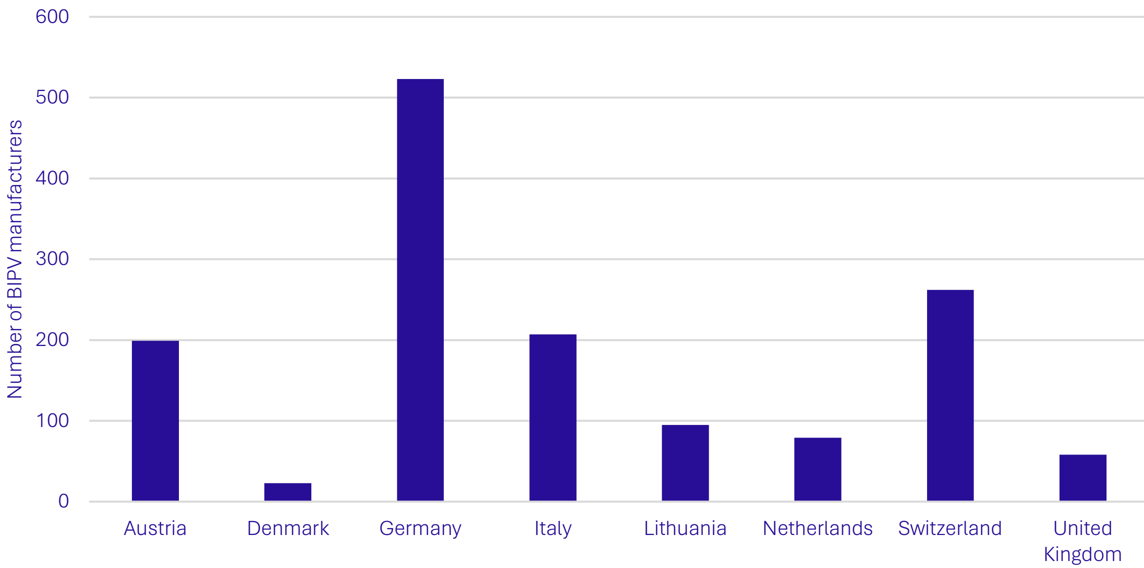
Manufacturer	Website
Industrie Cotto Possagno (IT)	www.cottopossagno.com
Dyaqua (IT)	www.dyaqua.it
STG Group (Energyglass) (IT)	www.energyglass.gruppostg.com
Sunerg (IT)	www.sunergsolar.com
Tegola Canadese (IT)	www.tegolacanadese.com
Glass to Power (IT)	www.glasstopower.com
Piz by Gruppo Zecca (IT)	www.piz.it
Sunspeker (IT)	www.sunspeker.com
Gielleplast (IT)	www.gielleplast.tech
Fly Solartech Solutions Srl (IT)	www.flysolartechsolutions.com
Sottile Solar (IT)	www.sottile.solar
Peimar (IT)	www.peimar.com
Trienergia Srl (IT)	www.trienergia.com
SoliTek (LT)	www.solitek.it
Intelligent Solar (LT)	www.intelligentsolar.eu
Metsolar (LT)	www.metsolar.eu
ViaSolis (LT)	www.viasolis.eu
Solinso (NL)	www.solinso.nl
Hermans Techniglaz (NL)	www.hermanstechnisolar.com
Kameleon Solar (NL)	www.kameleonsolar.com
Pixasolar (NL)	www.pixasolar.com
Solarix (NL)	www.solarix-solar.com
myenergyskin by Eigenenergie (NL)	www.myenergyskin.nl
Zigzagsolar (NL)	www.zigzagsolar.nl
Stafier (NL)	www.stafier.com
Sol R&D (NL)	www.sol-rnd.com
Wienerberger (NL)	www.wienerberger.com
Soluxa BV (NL)	www.soluxa.solar
BIPVprojects (NL)	www.bipv.world
Solskifer (N)	www.solskifer.no
Apollotech (N)	www.apollotech.no
Innos AS (N)	www.innos.no
Electrotile (PL)	www.electrotile.com

Manufacturer	Website
ML System (PL)	www.mlsystem.pl
Energals by D.A.Glass (PL)	www.daglass.pl
Saule Technologies (PL)	www.sauletech.com
Onyx Solar (E)	www.onyxsolar.com
Solar Innova (E)	www.solarinnova.net
Izpitek (E)	www.izpiteksolar.com
Midsummer (S)	www.midsummer.se
Sunage (CH)	www.sunage.ch
3S Swiss Solar Solutions (CH)	www.3s-solar.swiss
Megasol Energie (CH)	www.megasol.ch
Swisspearl (CH)	www.swisspearl.com
Freesuns (CH)	www.freesuns.com
SunStyle (as Akuo Energy) (CH)	www.sunstyle.com
Solaxess (CH)	www.solaxess.ch
Zurich Soft Robotics (Solskin) (CH)	www.solskin.swiss
Gasser Ceramic (CH)	www.gasserceramic.ch
Solaronix (CH)	www.solaronix.com
iWin-innovative Windows (CH)	www.iwin.ch
Ernst Schweizer AG (CH)	www.ernstschweizer.ch
ACTIV'GLASS Issol Schweiz AG (CH)	www.activ-glass.com
ViridianSolar (Marley Ltd) (UK)	www.viridiansolar.co.uk
Colt (UK)	www.coltinfo.co.uk
BIPVco (UK)	www.bipvco.com
Polysolar Ltd (UK)	www.polysolar.co.uk
BMI Group (UK)	www.bmigroup.com

Key industry players

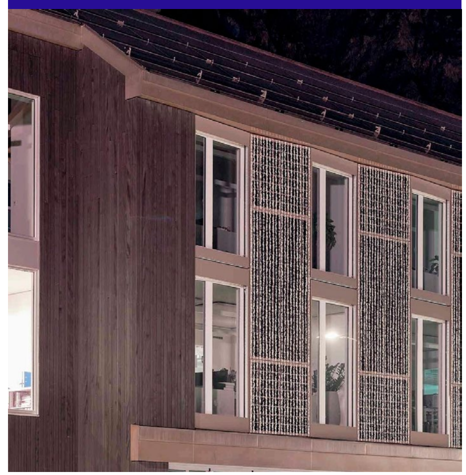
In Europe, approximately 2,500 employees have been identified working for solar construction manufacturers. At the regional level, Exhibit 8 shows the number of employees for each country where at least three active BIPV manufacturers have been counted. More than 500 employees were counted in Germany, 250 in Switzerland, and around 200 in Italy and Austria. However, the number could be higher, as companies whose core business is not the production of photovoltaic modules for the BIPV industry, such as plastics companies that only have a small line dedicated to BIPV semi-finished products, have not been included.

Exhibit 8: Number of employees by country (≥3 manufacturer per country)



> "
> On average, a BIPV end-product manufacturer produces around 600 m² per employee per year.

Photo: Betriebsgebäude Rhiienergie.
Credits: Yufei He / BUK ETHZ



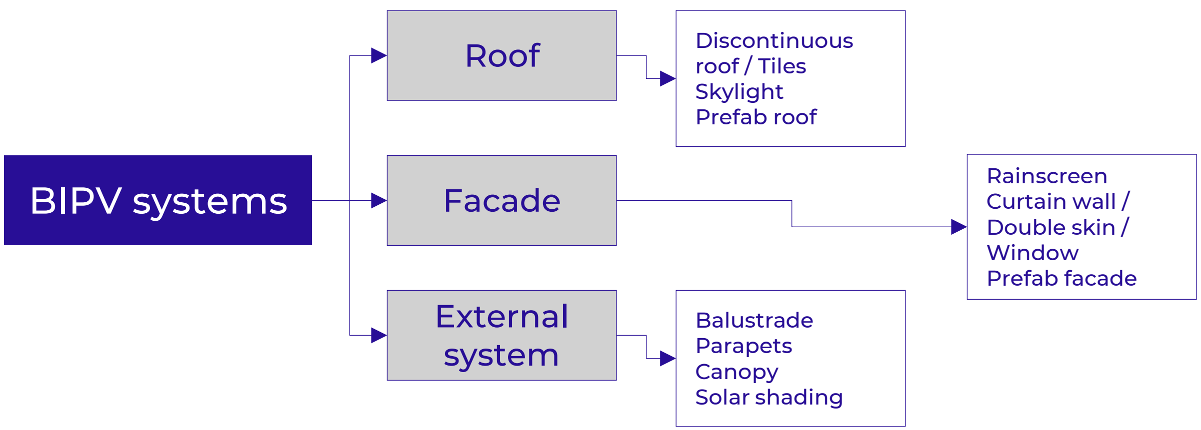
Solar applications available on the market

Construction systems for BIPV solutions can be categorized into the following three technological groups and described as outlined in the IEA [3]:

- **Roof**: a roof, in a traditional building construction, with a top distinguishable by the facade, is the top covering providing protection and separating indoor and outdoor environments
- **Facade**: a facade, in a traditional building construction with parietal walls distinguishable by the roof, is the vertical (or tilted) exterior surface that is the architectural showcase and separates indoor and outdoor environments
- **External system**: elements and systems of the building skin that are in contact only with the outdoor environment

For each technological group, a further taxonomy has been defined to define the individual technological system. Figure x shows the complete classification for BIPV systems.

Exhibit 9: BIPV system classification



Roof

Photo: Haus Schneller Bader. Credits: Yufei He / BUK ETHZ

Facade

Photo: Solaris. Credits: Yufei He / BUK ETHZ

External system

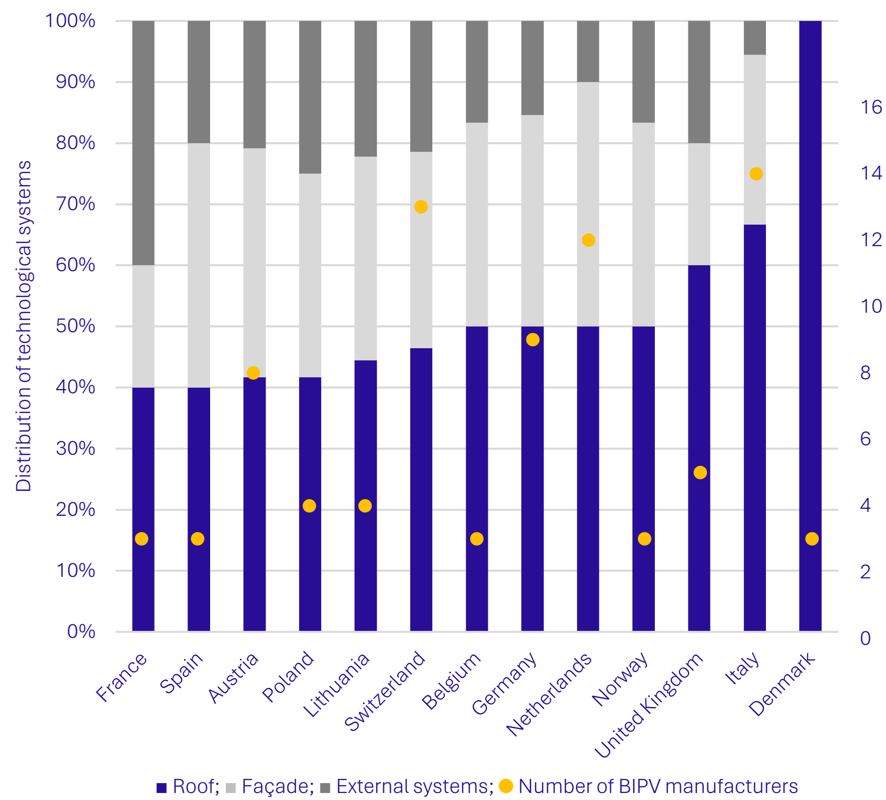
Photo: MFH Altstetten. Credits: Yufei He / BUK ETHZ

Solar applications available on the market

The analysis of solar technological systems in Europe considers only end products solar manufacturers, for a total of 74 manufacturers. Of these, 89% include roofing systems among their solutions, 50% façade systems, and 45% external systems, such as parapets or shading devices. Approximately 36% of manufacturers offer solutions that cover all three categories: roofing, facades, and external systems. In terms of technology, 88% of the manufacturers analyzed include discontinuous roof solutions in their portfolio, 32% skylights, 30% curtain walls, 45% rainscreens, and 45% external solutions. Prefabricated solutions are less common, with only 4% including prefabricated roofing solutions and 7% prefabricated facade systems.

Exhibit 10 shows the distribution of solar technological systems by country, where a single manufacturer may appear multiple times if it manufactures products for more than one technological system. The differences between countries reflect the heterogeneity of the product portfolio. However, it is possible to identify some general trends. First, every country can offer at least one product for roofing applications. In countries where roofing products are not the only solution provided (e.g., Germany, Switzerland, Italy), products for facades and external systems are also offered in addition to roofing solutions. Among the countries with three or more active manufacturers, Italy and the United Kingdom stand out for their focus on roofing solutions, which account for 67% and 60% of the total, respectively. In contrast, the Netherlands and Austria are the countries with the most widespread façade solutions, accounting for 40% and 38% of the total, respectively. Furthermore, it was noticed that the four countries with only one active manufacturer, Estonia, Hungary, Croatia, and Sweden, specialize in offering roofing systems.

Exhibit 10: Distribution of solar technological systems by country. Only countries with >3 manufacturers are showcased.



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Policies and finance schemes opportunities

Since 2019, the introduction of the European Green Deal has outlined one of the most determined roadmaps for decarbonizing cities and buildings. In this sense, BIPV plays a direct role in achieving the European climate goals by generating electricity locally, reducing losses, and relieving pressure on distribution networks. It also enables renewable generation within cities and supports dense urban development. Through specific initiatives, such as the Renovation Wave and the Net Zero Industry Act (NZIA), the European Green Deal has facilitated the launch of EU country-specific financing programs and supporting schemes to boost local BIPV production lines. For example, the Netherlands and France are supporting the BIPV industry with National subsidies, where new gigafactories are planning significant expansion in these countries. Spain, on the other hand, is directly supporting innovative photovoltaic solutions through the EU funds under the NextGenerationEU framework.

With the objectives of the NZIA, it is expected that EU members will increase the number of financial measures aimed at strengthening the resilience of the EU net-zero industry.

A passive catalyst for the BIPV manufacturers comes from financing schemes for private, public, and business-related installations. Feed-in tariffs and single remuneration bonuses remain available; however, most countries have removed the distinction between BIPV and BAPV to ease bureaucratic processes. Among the countries that still differentiate, Austria and Switzerland are providing single remuneration bonuses for BIPV on top of the BAPV ones.

Within the policy framework of Fit-for-55 and the Renovation Wave, BIPV plays a direct role since it delivers both aesthetic and energy upgrades to existing and new buildings. It is consequently expected that EU member countries will reintroduce a differentiation between BIPV and BAPV for installation bonuses, similar to the 2007-2016 period, when EU manufacturers experienced their major increase. For example, in 2012, Pronovo, the Swiss authority responsible for PV subsidies, provided a bonus of about 17’300€ for a 10kWp system, while in 2025, the number decreased to about 4’300€ and or 8’500€ if the angle is above 75 degrees (exchange rate applied: CHF to EUR, September 2025).

2010

EPBD revision [4]
Since 2021, all new buildings must meet Nearly Zero Energy Buildings (NZEB) standards and BIPV directly contributes by integrating energy generation into the building envelope.

2019

European Green Deal [5]
Aims to cut emission by at least 50% by 2030, setting the neutrality goal for 2050 through the European Climate Law.

2020

Renovation Wave [6]
A key initiative of the Green Deal, one of the main focuses is the renovation of EU publics buildings, in which BIPV can play a key role by boosting both energy performance and building aesthetic

2021-2022

Fit-for-55 and REPowerEU [7]
Under REPowerEU, rooftop solar installations are set to double by 2025; supporting the fit-for-55 target of 55% emission reduction by 2030.

2023

Net Zero Industry Act (NZIA) [8]
It supports the Green Deal by aiming for 40% EU manufacturing capacity for clean technologies by 2030, reducing reliance on non-EU imports.

Policies and finance schemes opportunities

1 Regulation and Standards for BIPV [9]

EN 50583 outlines the requirements for BIPV, recognizing both modules and systems as electrical products and construction elements, with mandatory compliance in areas such as:

- Electrical safety standards
- Structural durability
- Fire safety regulations within the EU

Future regulatory updates may incorporate Circularity criteria, Standardized traceability in public procurement and PV Passports with digital product documentation. These requirements are complemented by related frameworks, including the Construction Products Regulation and the revised Energy Performance of Buildings Directive (EPBD).

2 Quality driven procurement

Member states are authorized, through the NZIA articles 25-28, to reward qualitative criteria in public tenders, offering bonus points for sustainable and resilient technologies. The so called Non-Price Criteria (NPC) strengthen industrial resilience, by allowing qualitative BIPV projects to be prioritized based on some of the following aspects:

- Low carbon footprint (<550 gCO_2/kWp – EcoDesign proposal)
- Circular design (recyclable, non-toxic materials)
- Traceable EU value chain stages
- Social compliance (forced labour ban, 2024)

3 Public sector as market maker

Several Member States are piloting dedicated ‘resilience auctions’ with bonuses for projects that meet EU content or ESG (Environment, Social, Governance) standards.

Under these auctions, projects complying with resilience criteria, such as domestic manufacturing and circular design, could receive up to a 15% cost premium.

National and municipal procurement can support BIPV by making it a requirement or awarding additional points in new building and deep renovation projects.

4 Incentives and finance schemes

Specific fundings are eligible under REPowerEU, RRF (instrument of NextGenerationEU), green bonds, tax incentives, national BIPV bonuses. These financial instruments are enabling deep renovation, but don’t define the operational framework.

Integration into deep renovation programs (Renovation Wave, Energy Efficiency Directive, etc.) accelerate implementation by aligning incentives with climate targets.

In the next slide we will see some of the difference strategies currently adopted by countries.

Policies and finance schemes opportunities

2014-2020

Horizon 202013
Europe (2014-2020)
EU research and innovation founding. Some of the projects are: PVSITES15, BIPVBOOST [10], and BE-SMART [11]

BEIS Energy Innovation Programme [12]
UK (2015-2021)
The funding for innovation in renewable technologies aims to accelerate the commercialization of innovative clean energy technologies

Next Generation EU5
European Union (2020-)
Regulatory framework to help EU transform, recover and be more resilient, particularly in the green sector

2020

Superbonus [15]
Italy (2020-)
Financial concession for energy efficiency upgrades in residential buildings, up to 55% in tax deductions

Horizon [14]
(2021-2027)
EU research and innovation founding after Horizon 2020.

Subsidy for innovative Photovoltaic [13]
Austria (2021-)
Innovative Photovoltaic systems premium on subsidy rates

Net Zero Innovation Portfolio [12]
UK (2021-)
Provides founding for low carbon technologies and systems, clean energy supply chains and ensure the clean energy revolution is built in UK

2021

2022

REPowerEU [16]
European Union (2022-)
Policy framework aiming to lower the dependence from fossil fuel

Single Remuneration [17]
Switzerland (2022-)
BIPV remuneration enhanced with a bonus for the slope angle bigger than 75 degrees

Crédit d'Impôt Investissements Industrie Verte (C3IV) [19]
France
A tax credit to support companies in key green industry sectors

Net Zero Industry Act (NZIA) [18]
European Union (2024-)
Regulatory framework to strengthen the competitiveness of EU industry and technologies crucial for the decarbonization. Clean technologies should account for the 40% of EU manufacturing capacity.

2024

2025

Bonus provenience EU/CH [22]
Austria (2025)
10% additional surcharges for EU added value on new PV installations

Climate-Neutral Economy Manufacturing Investment Subsidy (IMKE) [21]
Netherlands
Subsidy to support new local BAPV and BIPV production lines

PRTR [20]
Spain, EU
Incentive Program for Innovative Renewable Energy and Storage Projects, founded by next generation EU

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Requirements for BIPV products

This section is focused on providing, especially to BIPV manufacturers, the market appeal of BIPV solutions from the perspective of the construction sector. The outcome is based on surveys and interviews involving about 45 stakeholders across thirteen regions and markets.

- **Aesthetics**: key requirements defined as color customization, visual perception, shape, size, flexibility, format, texture, and integration.
- **Cost**: it varies depending on the type of stakeholder, geographical location, and technology. The acceptable cost is influenced by complex and interconnected factors and requirements.
- **Certification and standards**: compliance of BIPV products with adequate IEC standards and certifications.
- **Durability and quality**: expectation of BIPV products to have adequate durability, mechanical stability, UV resistance, adhesion quality and comparable to standard construction material lifetimes.
- **Support and education**: providing product technical data, datasheets, mounting instructions, good brochures, etc.
- **Fire and electrical safety**: fire and electrical safety must be addressed for any BIPV product. IEC standards cover BIPV module safety, but stakeholders involved in risk management in construction projects request extra caution.
- **Efficiency**: electrical efficiency is not a top priority, but it influences the return on investment.
- **Functional performance**: thermal performance, water tightness, handling of loads, ventilation anti-glare, and transparency are the most recurring required performance.
- **Compatibility with standards**: BIPV products require simplicity, ease of installation, functionality as building material, standard installation effort and compatibility with standard construction materials.
- **Structural performance and mounting**: the ease of installation without imposing additional tasks.

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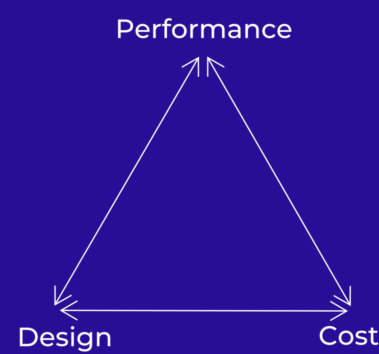
A BIPV designer seeks the point where cost, performance, and design reach an acceptable balance.



Conclusions

European policies are creating favourable conditions for BIPV, recognising its role in decarbonising the built environment. Initiatives such as the Green Deal, Renovation Wave, and NZIA reinforced the value chain by introducing subsidies and supporting local BIPV production. A return to dedicated measures for BIPV is desirable, given its aesthetic and energy value in new buildings and renovations. The following short report aims to provide an overview and identify trends among solar building material manufacturers in Europe , supporting the sector's development and identifying opportunities for government agencies, public institutions, investors, and manufacturers themselves.

Unlike traditional photovoltaic module producers or building material manufacturers, solar building material manufacturers must have in-depth knowledge and expertise in both the solar industry and the building sector. A high level of knowledge is required from manufacturers to ensure reliability and minimize risks throughout the solar construction process. This includes a deep understanding of product performance, testing, certification, and innovation, as well as the ability to manage costs and risks, thereby earning stakeholders' trust.

The overview of the European hub for solar material production shows that Italy, Switzerland, the Netherlands, and Germany account for approximately 50% of Europe's BIPV manufacturers. In terms of production sites, Germany is the European leader with 7, followed by Austria with 6, Italy, and Switzerland (5).

In Europe, approximately 2,500 employees have been identified working for solar construction manufacturers. At the regional level, more than 500 employees were counted in Germany, 250 in Switzerland, and around 200 in Italy and Austria.

As regards the technologies most commonly offered by BIPV manufacturers, 89% include roofing systems in their solutions, 50% focus on façades, and 45% cover external systems, such as parapets or shading systems. Approximately 36% of manufacturers offer solutions that cover all three categories: roofing, facades, and external systems. In terms of technology, 88% of the manufacturers analyzed include discontinuous roof solutions in their portfolio, 32% skylights, 30% curtain walls, 45% rainscreens, and 45% external solutions. Prefabricated solutions are less common, with only 4% including prefabricated roofing solutions and 7% prefabricated facade systems.

The focus on requirements for BIPV products aims to strengthen an active collaboration between the BIPV and the construction industry. Ten key requirements have been identified to enable the smooth and effective integration of PV technology into buildings.

Photo: Haus Brunner Bapst. Credits: Yufei He / BUK ETHZ

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This report provides an overview of mega-trends in the EU BIPV (Building-Integrated Photovoltaics) market and is intended for informational purposes only. While we have made every effort to ensure the accuracy of the data and information presented, we do not guarantee that it is exhaustive or without error. The information contained in this report should not be used for business plans, commercial strategies, or other financials or operational decision-making without a previous validation. Any data or information from this report must be properly attributed to the source. We assume no responsibility or liability for the use of the data for commercial or business purposes.

Photo: Unterwerk Stenna (top); Verkehrsstützpunkt Kapo Chur (bottom). Credits: Yufei He / BUK ETHZ

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