



Task 1 Analysis & Outreach

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National Survey Report of PV Power Applications in Belgium

2024



What is IEA PVPS TCP?

The International Energy Agency (IEA), founded in 1974, is an autonomous body within the framework of the Organization for Economic Cooperation and Development (OECD). The Technology Collaboration Programme (TCP) was created with a belief that the future of energy security and sustainability starts with global collaboration. The programme is made up of 6 000 experts across government, academia, and industry dedicated to advancing common research and the application of specific energy technologies.

The IEA Photovoltaic Power Systems Programme (IEA PVPS) is one of the TCPs within the IEA and was established in 1993. The mission of the programme is to “enhance the international collaborative efforts which facilitate the role of photovoltaic solar energy as a cornerstone in the transition to sustainable energy systems.” In order to achieve this, the Programme’s participants have undertaken a variety of joint research projects in PV power systems applications. The overall programme is headed by an Executive Committee, comprised of one delegate from each country or organisation member, which designates distinct “Tasks,” that may be research projects or activity areas.

The 28 IEA PVPS participating countries are Australia, Austria, Belgium, Canada, China, Denmark, Finland, France, Germany, India, Israel, Italy, Japan, Korea, Lithuania, Malaysia, Morocco, the Netherlands, Norway, Portugal, South Africa, Spain, Sweden, Switzerland, Thailand, Türkiye, the United Kingdom and the United States of America. The European Commission, Solar Power Europe and the Solar Energy Research Institute of Singapore are also members.

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What is IEA PVPS Task 1?

The objective of Task 1 of the IEA Photovoltaic Power Systems Programme is to promote and facilitate the exchange and dissemination of information on the technical, economic, environmental and social aspects of PV power systems. Task 1 activities support the broader PVPS objectives: to contribute to cost reduction of PV power applications, to increase awareness of the potential and value of PV power systems, to foster the removal of both technical and non-technical barriers and to enhance technology co-operation. An important deliverable of Task 1 is the annual “Trends in photovoltaic applications” report. In parallel, National Survey Reports are produced annually by each Task 1 participant. This document is the country National Survey Report for the year 2024. Information from this document will be used as input to the annual Trends in photovoltaic applications report.

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COVER PICTURE

2024 BIPV Award winning BIPV solar façade from Kameleon Solar and Soltech located in the new Soltech factory in Genk



INTERNATIONAL ENERGY AGENCY
PHOTOVOLTAIC POWER SYSTEMS PROGRAMME

National Survey Report of PV Power Applications in Belgium 2024

IEA PVPS Task 1 Strategic PV Analysis & Outreach

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MAIN REFERENCES

The principal references are cited below, however, a number of additional sources including web sites, private communications



1 HIGHLIGHTS

- **Record global PV growth:** Installations reached 601 GW in 2024 (up from 465 GW in 2023), bringing total capacity to over 2.2 TW at the start of 2025 — enough to supply around 10 % of global electricity and avoid over 1 000 Mt CO₂ annually.
- **Historic price decline:** Module prices fell to record lows — 0.076 USD/W for p-type PERC and 0.091 USD/W for n-type TOPCon at the end of 2024— due to rapid n-type production capacity expansion and resulting manufacturing overcapacity.
- **Persistent market pressure:** Despite signs of price stabilisation late in 2024, the oversupply and prices below production costs continue to challenge PV manufacturers worldwide.
- **Strong growth in 2023:** Belgium installed ~2.5 GW of new solar PV capacity, a record high compared to an average of ~1 GW per year (2019–2022).
- **Stable but slightly lower 2024 trend:** At least 0.98 GW of new capacity was recorded in 2024, likely to be revised upward (as in past years). Adjusted for underreporting, ~1.4 GW of new installations are estimated.
- **Cumulative capacity:** By the end of 2024, Belgium reached 11.7 GW
- **Electricity generation:** In 2024, solar PV produced 8.32 TWh, covering at least 10% of Belgium's total electricity consumption
- **Market structure:** The Belgian PV market remains dominated by small-scale residential systems (<10 kW), though commercial, industrial, and utility-scale segments are expanding.
- **Residential prices:** Average turnkey cost for residential BAPV systems (5–10 kW) stood at 1.25 €/W (incl. VAT).
- **PV targets:** Belgium targets ≈ 16.5 GW (14 TWh) of PV by 2030 (Flanders: 8.2 TWh ; Wallonia: 5.1 TWh ; Brussels: 0.33 TWh). These ambitions are higher than in 2019 but remain insufficient to meet EU effort-sharing obligations.
- **Flanders renewable obligation:** Companies consuming >1 GWh/year must install or invest in renewable energy (PV, wind, CHP, HP). Deadline extended from June 2025 to April 2026; future entrants must comply within four years.
- **PV manufacturing:** Belgium's production remains limited, with Belga Solar's new 50 MW line (2024) and a planned 500 MW plant in Wallonia marking progress toward industrial-scale output.
- **PV research and innovation:** Belgium maintains broad R&D across the PV value chain, focusing on high-efficiency tandem and perovskite cells, offshore PV-wind hybridisation, and building-integrated PV. Efforts emphasise sustainability, recycling, and reduced use of critical materials.



2 INSTALLATION DATA

2.1 Methodology and sources

The principal references are cited below, however, a number of additional sources including web sites, private communications and diverse publications were also used:

Table 1: Data collection process

If data are reported in AC, please mention a conversion coefficient to estimate DC installations.	In the case of Flanders, the reported installation figures are in AC. The average considered DC/AC ratio is 1.21 (estimation).
Is the collection process done by an official body or a private company/Association?	In Belgium, the data collection process for solar PV installations is generally carried out by official regional authorities, although the level of public access and publication varies across the regions: • Flanders: The collection and publication of solar PV data are managed by the Flemish Energy and Climate Agency (VEKA – Vlaams Energie- en Klimaatagentschap), which is responsible for the monitoring and reporting of energy performance, including renewable energy deployment statistics. • Brussels-Capital Region: In Brussels, the competent authority is Brugel, the official energy regulator for the region. Brugel collects and manages data related to electricity production, including from solar PV systems, and plays a key role in regulating and monitoring the local energy market. • Wallonia: The competent authority is the Cwape, but data is not published publicly. Numbers shown are secondary data published by the association Energie Commune.
Link to official statistics (if this exists)	https://www.vlaanderen.be/veka/energie-en-klimaatbeleid-in-cijfers/energiekaart https://www.brugel.brussels/documents/statistics/rechercher
Data quality	In general data is often provisional and subject to future revision as grid operators provide additional or updated information.



2.2 Annual and cumulative PV market

Overview of annual and cumulative PV market in the world

Global PV installations surged again in 2024, setting another record and accelerating both the energy transition and structural shifts within the industry. Annual additions climbed to an unprecedented 601 GW — a sharp increase from 465 GW in 2023 — pushing total installed capacity worldwide past 2.2 TW at the start of 2025.

Between 2019 and 2022, Belgium installed on average just below 1 GW per year. In 2023, close to 2.5 GW were installed. In 2024, solar PV capacity additions were in line with this past trend (2019-2022) with at least 0.98 GW of new installations recorded for the year. However, this figure is likely to be revised upward, as has been the case in past years. For example, the 2023 value was initially estimated at 1.8 GW but later updated to 2.46 GW following more complete reporting from grid operators. To account for this trend of underreporting, an additional 400 MW should be provisionally considered for 2024 which would lead to 1.4 GW of annual capacity additions.

In 2024, cumulative capacity reached at least 11.7 GW (12.1 GW factoring in the 400 MW uncertainty).

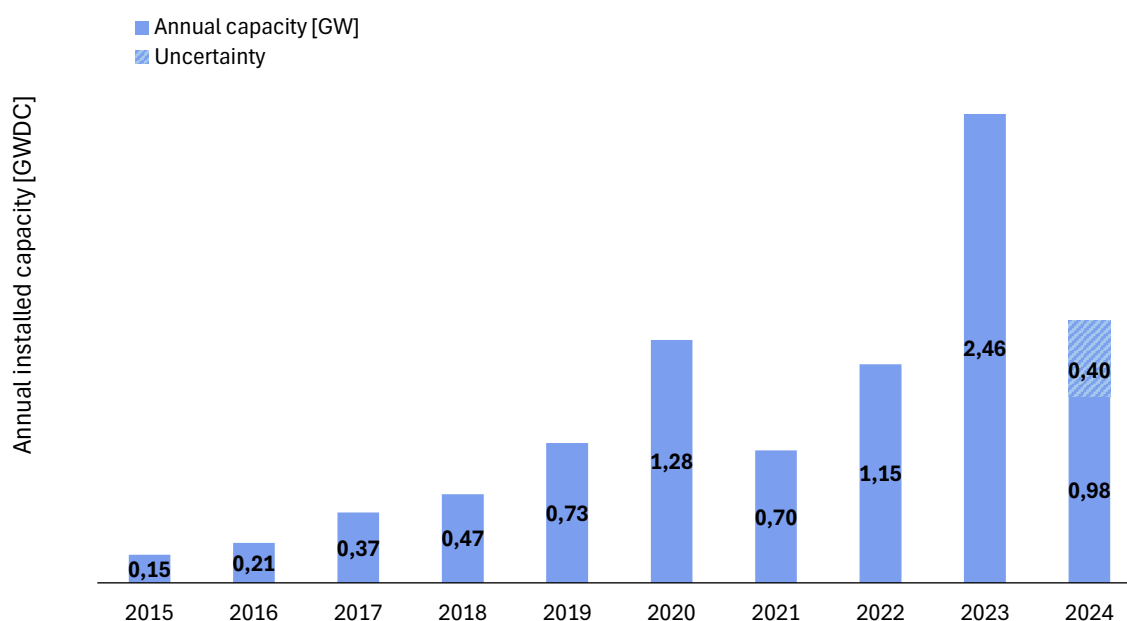


Figure 2-1. Evolution of annual capacity in Belgium, 2015-2024

With a population of 11.7 million inhabitants and a cumulative installed photovoltaic capacity of approximately 11.7 GW in 2024, Belgium reached a per capita PV penetration of 994 W/cap. This ranked the country fourth globally, trailing only the Netherlands (1 486 W/cap), Australia (1 463 W/cap), and Germany (1 186 W/cap). Over the past four years, Belgium has seen a remarkable and consistent upward trend in solar PV penetration per capita from 613 W/cap in 2021, rising to 706 W/cap in 2022, then to 911 W/cap in 2023, and finally approaching the symbolic kilowatt mark in 2024.

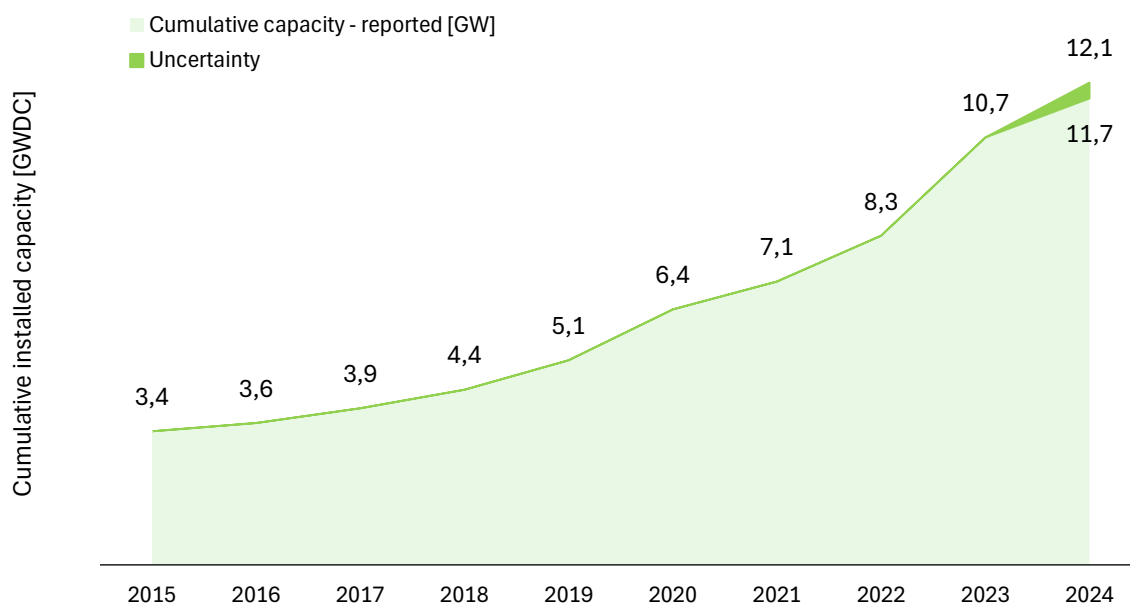


Figure 2-2. Evolution of cumulative capacity in Belgium, 2015-2024

2.3 Solar PV in the electricity mix

Overview of solar PV penetration in electricity mix in the world

The global cumulative solar PV capacity is projected to generate over 2 950 TWh in 2025, equivalent to at least 10 % of global electricity consumption, while avoiding more than 1 000 Mt of CO₂ emissions — roughly 2.8 % of total energy-related emissions.

In recent years, solar PV has significantly outpaced onshore wind in terms of annual capacity additions in Belgium. While cumulative installed wind capacity remains substantial, annual deployment data show a clear divergence in growth dynamics. From 2018 to 2024, PV

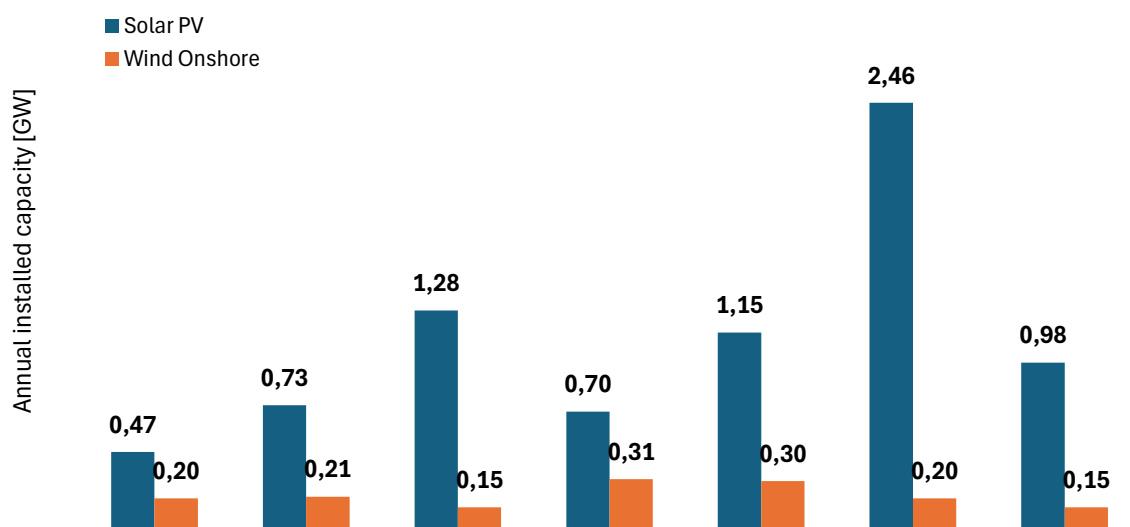


Figure 2-3. Evolution of annual solar and onshore wind capacity in Belgium, 2018-2024



installations consistently exceeded those of onshore wind, with especially strong growth observed in 2020 (1.28 GW) and 2023 (2.46 GW). In contrast, onshore wind capacity additions remained relatively modest, fluctuating around 200–300 MW annually, and dropping to just 150 MW in 2024.

In 2024, a total of 8.32 TWh of photovoltaic (PV) electricity was produced and injected into the electricity grid in Belgium. It is important to note, however, that this figure only accounts for the electricity that was delivered to the grid. It does not include the portion of solar electricity that was self-consumed on-site by households, businesses, or other producers. As a result, the actual total solar PV electricity production in Belgium in 2024 is higher than the reported 8.32 TWh. This highlights the growing role of decentralized energy production and self-consumption, particularly in the residential and commercial sectors, and suggests that the true contribution of solar PV to Belgium's energy mix is even more significant than grid-injected figures alone may suggest. In 2024, the electricity generation from solar PV systems, covered at least 10% of the total annual electricity consumption in that year which stood at 80.5 TWh.

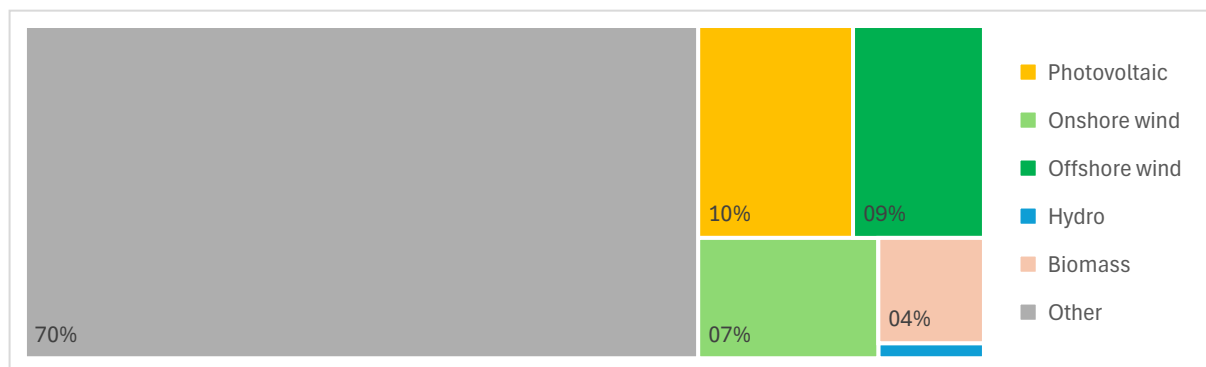


Figure 2-4. Contribution of different sources to the annual electricity production in 2024

2.4 PV market per region

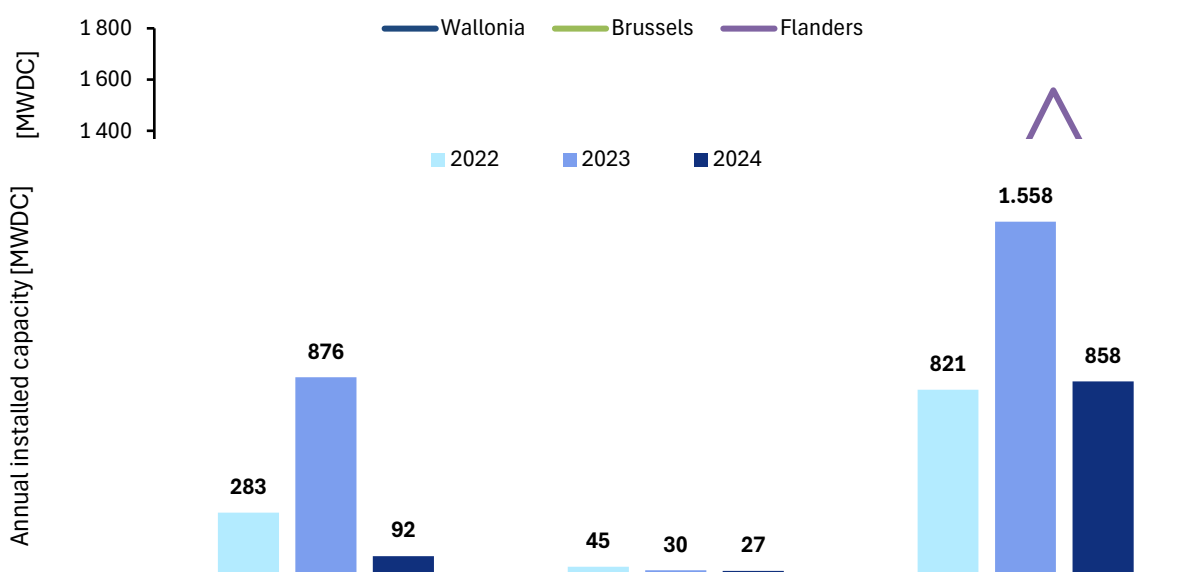


Figure 2-5. Evolution of annual capacity in each region, 2022-2024



The two graphs illustrate the evolution and regional distribution of PV installations in Belgium, showing significant fluctuations between 2022 and 2024. Flanders continues to dominate in terms of annual installed capacity, peaking at 1 558 MW in 2023 before declining to 858 MW in 2024. Wallonia experienced an even sharper swing, surging from 283 MW in 2022 to 876 MW in 2023, then plummeting to just 92 MW in 2024 (even if this value could be higher after updates). Brussels maintained a consistently modest market size, with installations hovering around 30 MW across the three years (as a result of this region's share in total country population and also due to the habitat configuration with more rentals and multiapartment houses/buildings). These trends reflect the impact of major changes in support schemes and incentives: the phase-out of the net-metering system in Wallonia and the end of 2023, or the end of the investment premium in Flanders at the close of 2023 significantly influenced installation behaviour, triggering a sharp market acceleration in 2023 followed by a contraction the following year. Additionally, the withdrawal of the federal VAT reduction for residential PV installations (from 6% to 21%) for homes under ten years of age added further upward pressure on the market in 2023. These policy shifts demonstrate the strong sensitivity of regional PV deployment to regulatory frameworks, a theme that is explored in greater depth in the policy section of this report.

2.5 Vision per Applications for Photovoltaics

In Belgium, the main applications of solar photovoltaics in 2024 are grid-connected systems, which can be broadly divided into three categories.

The **residential segment** remains the most visible, with installations on houses and multi-apartment buildings. System sizes are strongly shaped by the applicable support and regulatory frameworks: in Brussels, the limit for net-billing is set at 5 kVA, while in Wallonia net-metering historically applied up to 10 kVA. Typical installations fall within this range (0-10 kW). Since April 2024, Belgium has also authorised balcony PV systems, generally consisting of up to two panels (around 800 W). These plug-in units open solar access to tenants and urban households without suitable roof space. While their potential is promising as a complementary solution to BAPV, deployment data is not yet available given their recent introduction.

Balcony PV in PVPS countries

Although their overall contribution to installed capacity remains modest, plug-and-play or “balcony” PV systems — typically consisting of only a few modules — have been expanding rapidly in several European countries where they are permitted (e.g. Switzerland, Germany, France). These systems often represent the growing number of small-scale, partially unreported installations that may remain invisible to distribution system operators (DSOs) and national data collection efforts. Nevertheless, available statistics from some countries already highlight a strong appetite for such systems, which generally complement conventional rooftop PV by enabling installation in multi-apartment buildings, among tenants, or in locations where building-attached PV (BAPV) would otherwise be unfeasible. Germany surpassed 1 million units, equivalent to 1 GW, in June 2025; France reported over 100 000 units in 2024.

Commercial and industrial PV systems form another important segment. Installed on factory rooftops, warehouses, office buildings, or adjacent spaces such as reservoirs and parking lots, they typically range from 10 kW up to around 750 kW even if larger PV systems installed at commercial or industrial premises also exist. This category is characterised by larger arrays than in the residential sector, benefitting from economies of scale while remaining closely tied to the energy needs of the host facilities. The typologies are again mainly BAPV, although ground-mounted arrays can be found on unused land within industrial estates.



Finally, Belgium has seen the emergence of **utility-scale PV systems** (monitored as larger than 750 kW). This segment includes very large ground-based plants as well as floating PV projects and solar carport installations. Because Belgium does not operate a dedicated tendering scheme for large-scale solar, these projects typically develop in connection with major electricity consumers. Self-consumption is the primary driver, whether direct or through on-site power purchase agreements (PPAs). Off-site PPAs are also becoming more common, particularly between utilities and companies in the chemical and metal sectors. Pure merchant projects exist but remain limited for now, as market conditions and regulatory frameworks are not yet fully conducive to large merchant-based solar development.

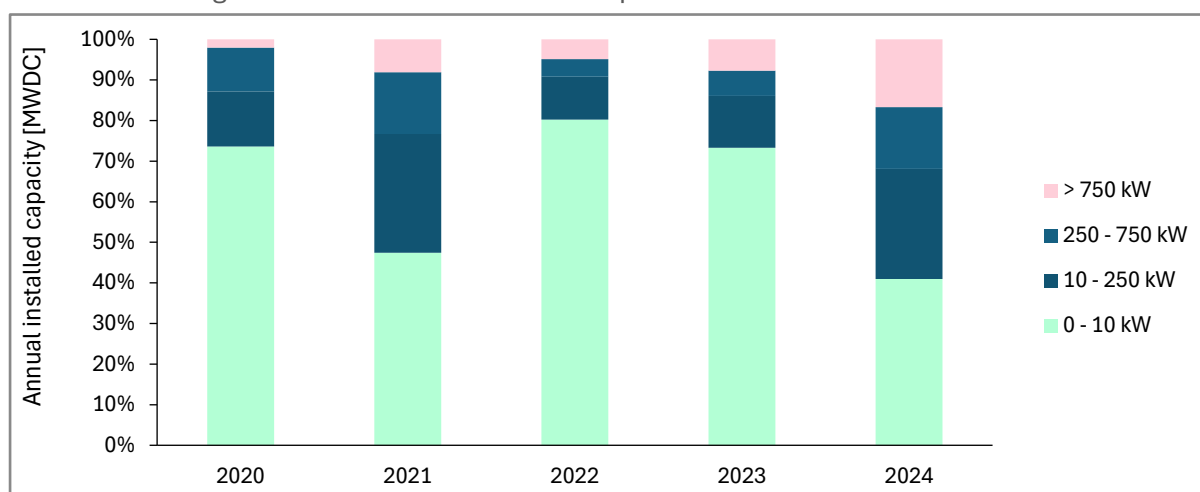


Figure 2-7. Relative contribution of different system sizes to the annual market, 2020-2024

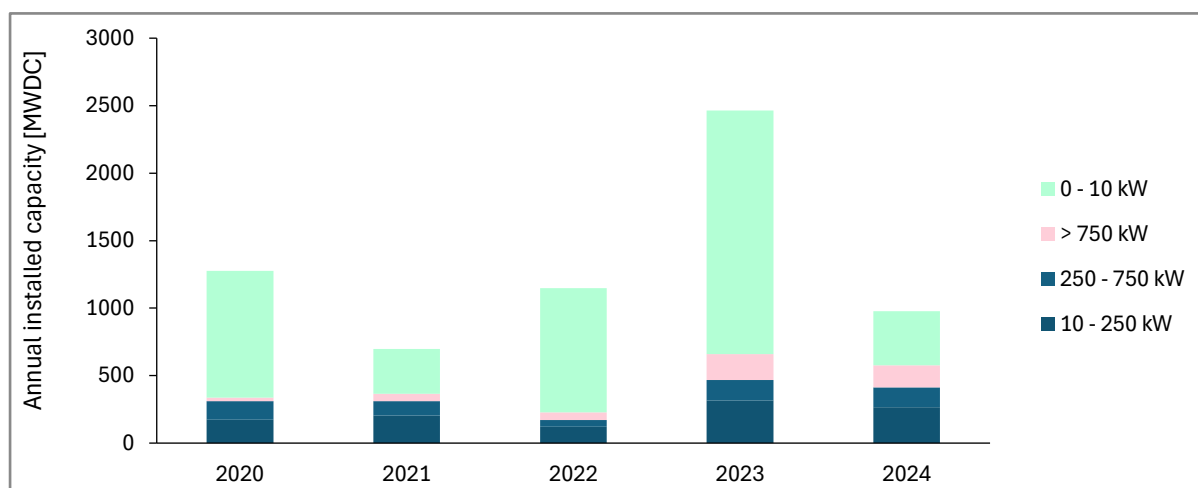


Figure 2-8. Absolute contribution of different system sizes to the annual market, 2020-2024

It can be seen from Figure 2-7 and Figure 2-8, that the Belgian PV market is largely based on solar PV systems with installed capacity below 10 kW (residential PV segment) even if the C&I and utility-scale segments are developing. In these figures, it can be seen how the phase-out of key support schemes in the residential PV segment at the end of 2023 in Flanders and Wallonia significantly affected the size distribution of new capacity between 2023 and 2024.



Integrated PV applications

- **Building-integrated photovoltaics:** Within the distributed PV segment, building-applied photovoltaics (BAPV) clearly dominate, with modules most often installed on pitched or flat roofs. Building-integrated photovoltaics (BIPV), by contrast, remain marginal and are largely confined to architectural showcase projects or high-profile demonstrators. The Brussels-Capital Region has introduced a dedicated support scheme that applies to certain BIPV systems, but uptake remains limited. Overall, the development of BIPV in Belgium follows the general dynamic of the distributed residential PV market, with a handful of flagship façade projects highlighting the technology’s architectural potential without yet translating into broad deployment.
- **Agrivoltaics:** Belgium does not currently have an official definition or regulatory framework for agrivoltaics, and this absence makes project authorisation challenging. In practice, permitting is particularly difficult due to the sensitivity of installing PV systems on agricultural land. As a result, only a few commercial initiatives have materialised, where PV generation is combined with agricultural activities such as beekeeping or sheep grazing. These remain exceptions rather than a mainstream application segment.
- **Floating PV:** Floating solar has so far developed only modestly in Belgium, with a handful of installations on industrial water reservoirs. These projects tend to be limited in scale and closely tied to adjacent industrial consumers. In addition, near-shore PV is at the experimental stage, with pilot projects under development to test the viability of such systems in Belgian conditions.

2.6 Key enablers of PV development

Table 2: Information on key enablers.

	Annual Volume	Total Volume	Source
Residential Heat Pumps (number)	50 147 units	342 405 units (+16%)	European Heat Pump Association, Climafed
100% Electric cars (number)	115 491 cars	254 240 cars (+83%)	Statbel
Hybrid (number)	172 870 cars	710.687 cars (+32%)	Statbel



3 COMPETITIVENESS OF PV ELECTRICITY

Global oversupply has put extreme pressure on module prices

In 2024, photovoltaic module prices fell to unprecedented lows, deepening the market imbalance that had emerged the previous year. P-type PERC modules dropped to around 0.076 USD/W, while n-type TOPCon modules were priced at approximately 0.091 USD/W by the end of the year. The rapid introduction and scale-up of n-type technologies spurred a massive global capacity expansion, resulting in significant manufacturing overcapacity and excess inventories. These conditions sustained downward pressure on prices throughout 2024, pushing many manufacturers toward unsustainable margins. By late 2023, mainstream module prices had already fallen below estimated production costs, and although some stabilisation signs emerged towards the end of 2024, the oversupply situation persisted.

3.1 System prices

PV system prices in Belgium display a broad variability, particularly in the small to medium-size segments. This price dispersion is shaped by several factors: the condition and complexity of the existing roof, the ease of installation, the type of supporting structures required, as well as the complexity of the grid connection and the associated development timelines. Although the international market witnessed a sharp decline in panel costs during 2023 and 2024, only part of this reduction has been passed on to end-users. In the distributed PV segment, the long chain of intermediaries tends to dilute the impact of falling module prices on final system costs.

It is worth noting that the price spread for PV systems below 10 kW narrowed significantly between 2023 and 2024. While the lower end of the range remained stable, the upper end declined. This shift reflects the surge in installations during 2023, as many households rushed to complete projects before the phase-out of net metering in Wallonia and the withdrawal of an investment subsidy in Flanders. The resulting supply–demand imbalance drove prices up and caused delivery delays at the time.

In the residential BAPV segment (5-10 kW), the average price (including VAT) was 1.25 €/W.

**Table 3: PV system prices of different typical PV systems**

Category/Size	Typical applications and brief details	Current prices [EUR/W]
Residential BAPV < 5 kW	Grid-connected, roof-mounted, distributed PV systems installed to produce electricity to grid-connected households. Typically roof-mounted systems on villas and single-family homes. Equipment and labour.	1.56 (VAT included) (1.25 – 2.05)
Residential BAPV 5-10 kW	Grid-connected, roof-mounted, distributed PV systems installed to produce electricity to grid-connected households. Typically roof-mounted systems on villas and single-family homes. Equipment and labour.	1.25 (VAT included) (0.95 – 1.75)
Small commercial BAPV 10-100 kW	Grid-connected, roof-mounted, distributed PV systems installed to produce electricity to grid-connected commercial buildings, such as public buildings, multi-family houses, agriculture barns, grocery stores etc.	1.00 (0.70 – 1.70)
Large commercial BAPV 100-250 kW	Grid-connected, roof-mounted, distributed PV systems installed to produce electricity to grid-connected large commercial buildings, such as public buildings, multi-family houses, agriculture barns, grocery stores etc.	0.7 - 0.8
Industrial BAPV 250-750 kW	Grid-connected, roof-mounted, distributed PV systems installed to produce electricity to grid-connected industrial buildings, warehouses, etc.	0.7 – 0.8
Small, centralised PV 750 kW-20 MW	Grid-connected, ground-mounted, centralised PV systems that work as central power station. The electricity generated in this type of facility is not tied to a specific customer and the purpose is to produce electricity for sale.	0.60 - 0.65

SOURCE: estimation Becquerel Institute based on limited market surveys.



3.2 Financial Parameters and specific financing programs

Table 4: PV financing information in 2024

Different market segments	Loan rate [%]
Average rate of loans – residential installations	In the Brussels-Capital Region, residents can access low-interest loans for energy-efficient home improvements, including solar PV installations, through the Green Loan Scheme¹. The options are: - Short-term consumer loans with interest rates ranging from 0% to 1% with a maximum repayment period of 10 years. - Long-term mortgages with interest between 0% and 2% to be reimbursed within a maximum of 30 years. In Wallonia, the Ecopack Instalment Loan² is available for owner-occupied homes that undergo sustainable renovations, including the installation of solar PV systems. This 0% interest loan is offered for amounts ranging from €2,500 to €30,000, with repayment terms tailored to the applicant's income. (Between 5 and 12 years).

¹ <https://energy-cities.eu/best-practice/the-brussels-green-loan-scheme>

² <https://en.cpe-credit.com/blog/ecopack/>



3.3 Additional Country information: electricity prices

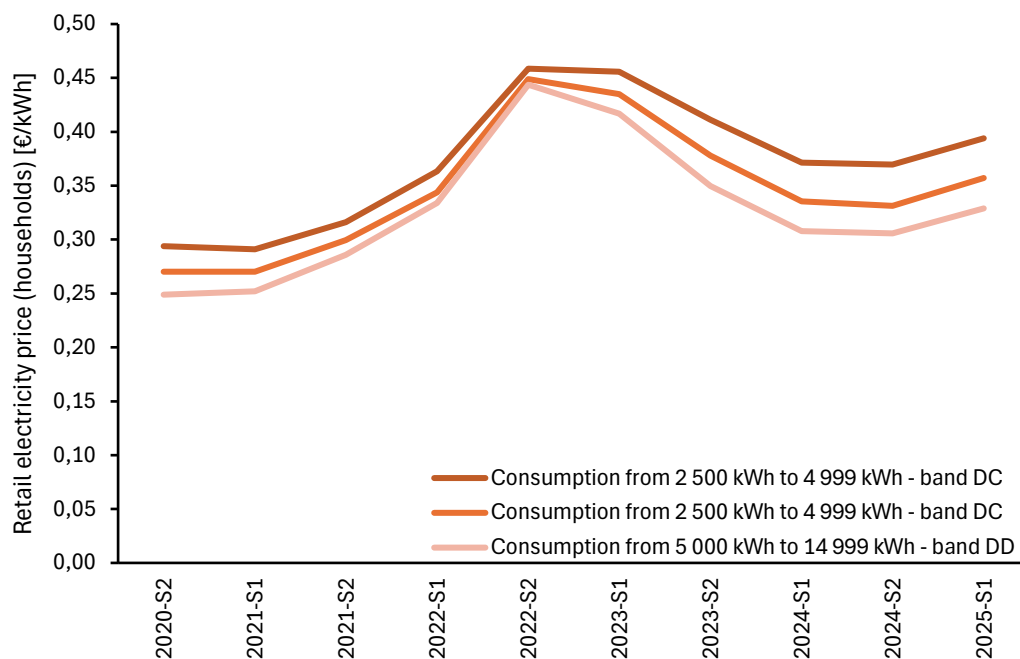


Figure 3-1: Retail electricity price* for households for different consumption bands
(Source: Eurostat)

*including all taxes and levies

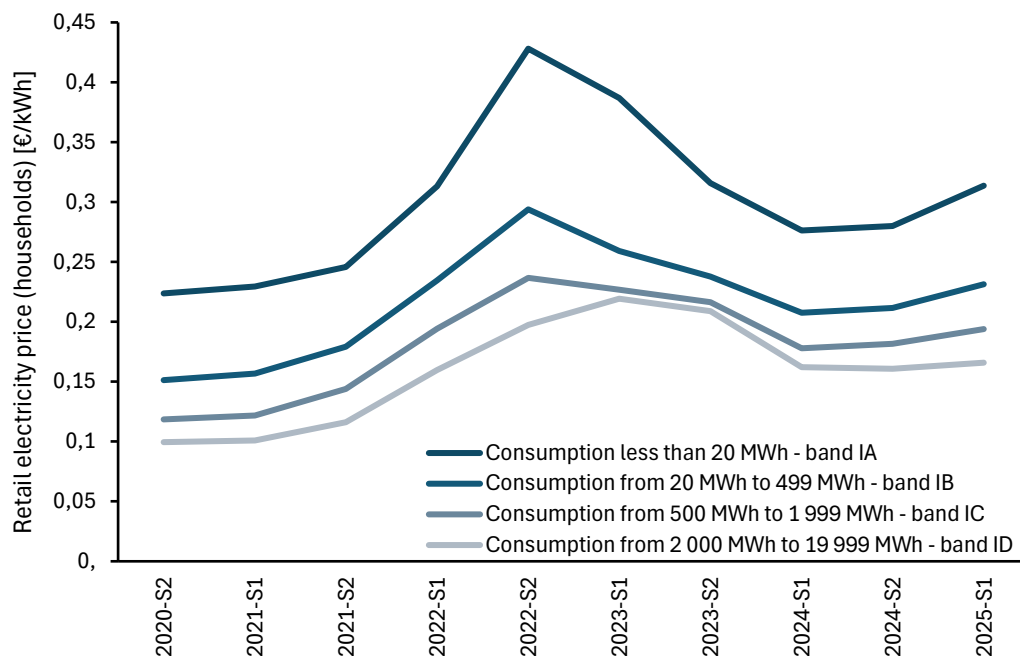


Figure 3-2: Retail electricity price* for non-households for different consumption bands
(Source: Eurostat)

*excluding VAT and other recoverable taxes



4 POLICY FRAMEWORK

This chapter describes the support policies aiming directly or indirectly to drive the development of PV. Direct support policies have a direct influence on PV development by incentivizing or simplifying or defining adequate policies. Indirect support policies change the regulatory environment in a way that can push PV development.

Table 5: Summary of PV support measures

Category	Residential		Commercial + Industrial		Centralised	
Measures in 2022	On-going	New	On-going	New	On-going	New
Feed-in tariffs						
Feed-in premium (above market price)						
Capital subsidies		Removed in Flanders, and no more vat reduction from 21% to 6% for houses <10 years in Belgium				
Green certificates	Yes in Brussels	-	Yes in Brussels and in Wallonia	-	Yes in Wallonia	
Renewable portfolio standards with/without PV requirements	-	-	-	-	-	-
Income tax credits		-		-	-	-
Self-consumption	yes	-	yes	-	yes	-
Net-metering		Phased out in Wallonia at the end of 2023				-
Net-billing	Brussels					-
Collective self-consumption and delocalized net-metering	yes	-	yes	-	yes	-
Sustainable building requirements	-	-		-	-	-
BIPV incentives	Yes in Brussels (higher GC grant rate for some BIPV systems)	-	-	-	-	-



Merchant PV facilitating measures	-	-	-	-	-	-
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4.1 National targets for PV

The framework for developing photovoltaics policies in Belgium is set at the regional level, with each region defining its own solar PV targets in its *Air, Climate and Energy Plan*. In 2019, these regional plans were combined into Belgium's first National Energy and Climate Plan (NECP), as required for all EU Member States, setting 2030 PV targets at 6.2 TWh for Flanders, 3.3 TWh for Wallonia, and 0.18 TWh for Brussels.

An updated NECP was due in 2023, and was submitted in Fall 2025, introducing only marginal changes with regards to solar PV targets compared to the previously submitted draft version. This draft built on the latest regional *Air, Climate and Energy Plans*, increasing the combined national ambition to around 14 TWh (≈ 16.5 GW) by 2030, with 8.2 TWh in Flanders, 5.1 TWh in Wallonia, and 0.33 TWh in Brussels. Despite these higher targets compared to the 2019 NECP, the ambitions remain insufficient for Belgium to meet the EU climate effort-sharing requirements.

By the end of 2024, Belgium is expected to have had nearly 12 GW of cumulative PV capacity installed. Meeting the current targets would require annual additions of less than 1 GW until 2030; however, installations reached an estimated 2.4 GW in 2023 and are forecast to be between 0.9 and 1.4 GW in 2024, and between 1 and 2 GW per year thereafter.

Important regional differences remain: Flanders is likely to reach its 8.2 TWh current target within a few years, while Wallonia will require more proactive policies to exceed business-as-usual trends and fully exploit available potential (e.g., ground-mounted systems on industrial wasteland, agri-PV, linear PV). According to studies such as those by EnergyVille, significantly higher PV capacity than currently planned will be needed for Belgium to meet its long-term climate objectives.

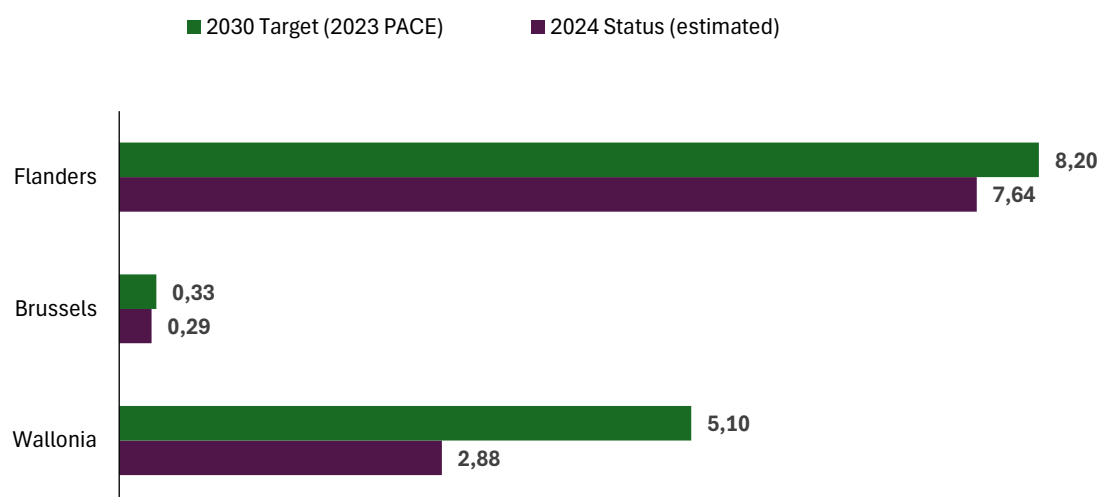


Figure 4-1: Comparison of 2024 current PV market status and 2030 targets (based on 2023 regional PACE)



4.2 Solar PV obligations

Based on the *Besluit van de Vlaamse Regering tot wijziging van het Energiebesluit van 19 november 2010, wat betreft de verplichte installatie van fotovoltaïsche zonnepanelen op dakoppervlakten*, companies in Flanders with an electricity consumption of more than 1 GWh in calendar year 2021 are required to fulfil an obligation related to the installation of renewable energy. The obligation had to be fulfilled initially by June 2025 (now delayed to April 2026). For companies reaching this electricity consumption threshold in a later year, the same obligation should be fulfilled by the 1st of January of the subsequent fourth calendar year. (Art. 6.7.3. §1) The obligations can be met through three different means:

- Commissioning photovoltaic systems
- Commissioning other renewables (wind turbines, CHP, HP)
- Participating financially in renewable projects commissioning (PV, wind turbines, CHP)

VEKA (Vlaams Energie- & Klimaatagentschap) the Flemish Energy and Climate Agency, determines whether the PV obligation is met or not (through PV or other alternative means for compliance). In case of non-compliance, an administrative fine of 400 € per kWp missing at the time when the obligation had to be met. Paying the fine does not mean that the company now complies with the obligation.

As part of the *revised regional urban planning regulation*, in Brussels region new buildings with a flat roof area greater than 20 m² have to dedicate part of this area to renewable energy production (including PV), to urban agriculture, to recreation function or to nature development.



5 INDUSTRY

5.1 Manufacturing

Belgium's PV manufacturing capacity remains modest, with only a handful of factories operating at scales ranging from a few megawatts to several tens of megawatts per year. Among the main players, Belga Solar (formerly Evocells) commissioned a new production line in early 2024 with an annual capacity of about 50 MW, marking one of the country's more substantial manufacturing facilities. Soltech continues to focus on producing innovative integrated photovoltaic (IPV) products, though its annual output remains limited to just a few megawatts as of the end of 2023. Looking ahead, a new module assembly plant in Wallonia is planned, which is expected to significantly boost domestic manufacturing capacity to 500 MW annually by 2025 (based on information available on their website, although exact timeline is uncertain). This development could represent a step change in Belgium's PV production capabilities, transitioning from small-scale, niche manufacturing to a more industrial scale.

5.2 Recycling

In Belgium, the recycling of solar panels is governed by European legislation, which has been in place since 2012 and transposed by the country's three regional authorities. To meet the requirements of the WEEE directive, producers, such as solar panel importers and manufacturers, are responsible for ensuring that the products they introduce into the market are recycled at the end of their life cycle. While producers can establish their own take-back and recycling systems, most opt to join existing programs like PV Cycle Belgium. This organization, which is overseen by the regional authorities and governed by industry federations, manages the entire process of panel collection and recycling in Belgium.

The implementation of this obligation occurred at different times across the regions: in Flanders, it took effect on July 1, 2016; in Brussels, it started on July 1, 2020; and in Wallonia, it was introduced on January 1, 2022. PV Cycle Belgium ensures that the solar panels are primarily recycled in Belgium, with key recycling partners such as BNE Trading & Recycling, located in Neerpelt, and Comet Groep in Châtelet. BNE, part of the Multi Continental Group, is dedicated to the recycling of electrical and electronic equipment, including solar panels, employing a specialized team to manage this process. Similarly, Comet Groep, a family-owned company specializing in metal processing, collaborates with Recma in Seraing to dismantle and recycle solar panels. Through their joint Solarcycle partnership, they are also working to develop more sustainable recycling techniques. Together, these efforts contribute to Belgium's circular economy and support the country's commitment to meeting the legal obligations of solar panel recycling.



6 PV IN THE ECONOMY

6.1 R&D trends

In Belgium, research and development efforts in photovoltaics (PV) cover the entire value chain, from the development of new cell architectures to advances in power electronics, Agri-PV, floating solar, offshore PV-wind hybridization, building-integrated PV (BIPV), and large-scale solar installations. These activities are carried out across multiple universities and research centers, fostering innovation and accelerating the integration of PV into diverse applications.

A key focus remains on tandem solar cell technology. Within the PERCISTAND project, thin-film tandem solar cells have achieved efficiencies of up to 30%, providing a sustainable alternative to conventional silicon PV ([EnergyVille](#)). Additionally, the LAPERITIVO project, coordinated by imec under the Horizon Europe program, is working on large-area, stable perovskite solar modules, aiming for 22% efficiency for opaque and 20% for semi-transparent devices ([EnergyVille](#)).

Belgium is also making strides in offshore floating PV (OFPV). The SWiM project is assessing the feasibility of integrating PV into offshore wind farms within Belgium's Exclusive Economic Zone, with the aim of maximizing the complementarity of solar and wind energy production at sea ([EnergyVille](#)). On land, large-scale solar installations continue to expand, exemplified by the HELIOS project in Wallonia, which recently completed a 60 MW solar farm, one of the largest in the region ([SPIE](#)).

Another area of growing interest is building-integrated photovoltaics (BIPV). The BIPV4ALL project is advancing the integration of PV into façade bricks, roof tiles, and wall panels, making it easier for architects and manufacturers to incorporate solar technology into energy-efficient buildings ([EnergyVille](#)).

Belgian research continues to prioritize sustainability and circularity. Increasing emphasis is being placed on life cycle assessments (LCA), recycling of end-of-life PV panels, and the development of low-carbon footprint solar cells and modules. Particular attention is being given to reducing dependency on scarce materials such as indium, bismuth, and silver, ensuring a more sustainable supply chain ([EnergyVille](#)).

Belgium is also investing in education and workforce development to support the energy transition. A new English-language Master of Science in Energy Engineering Technology at UHasselt/KU Leuven has been introduced, equipping engineers with expertise in sustainable energy production, conversion, and storage ([EnergyVille](#)).

Through its broad and ambitious research agenda, Belgium continues to push the boundaries of PV technology, reinforcing its position as a key player in the transition to a sustainable energy system.

