ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE 2022
OPENING UP THE POTENTIAL OF WINDOWS

The Energy Performance of Buildings Directive (EPBD) has contributed to improving the energy performance of European buildings and our associations **ARGE, European Aluminium, EPPA, ES-SO, EuroWindoor** and **Glass for Europe** are strong supporters of this framework.

Buildings account for about 40% of the energy consumption and 36% of CO_2 emissions in the EU[1]. If Europe is to achieve its decarbonisation goals and contribute fully to the realization of the Paris agreement, **a massive reduction of buildings' energy needs is a necessity**. This can only be achieved by starting to improve the energy performance of the building's envelope in line with the Energy Efficiency First Principle. Only a building stock with a very low energy need could unleash the full carbon reduction potential of renewable energy generation.

High-performance windows and glazed areas in buildings are essential to the overall energy performance of buildings, but also to the general comfort and well-being of people living and working in these buildings. To reap these benefits, the EPBD needs to foster the right assessment of the energy performance of glazed areas and establish the right mechanisms and incentives for market actors to deliver massive energy savings.

The proposal for a recast of the EPBD is a unique opportunity to optimise the energy performance of buildings. Our sector considers that the following key objectives should be pursued:

1. Supporting **window replacement** to accelerate the Renovation Wave in line with the Energy Efficiency First principle.
2. Using **the "Energy Balance"** approach to assess **the energy performance of windows.**
3. Defining and securing **Healthy Indoor Climate.**

[1] European Commission website on Energy performance of buildings directive

1. Supporting window replacement to accelerate the Renovation Wave in line with the Energy Efficiency First principle

While having been effective in improving the energy performance of new buildings, the EPBD has not provided the required boost to renovation and window replacement. The rate of building renovation in the EU remains low and is insufficient to achieve the EU energy and climate objectives.

The European window industry welcomes the recast of the EPBD as an important instrument to achieve the aims of the renovation wave initiative. In particular the following key elements are considered crucial in this context:

- The general commitment to **renovation targets** for public and non-residential buildings
- The introduction of **minimum energy-efficiency performance standards** for worst performing public and non-residential buildings by 2027 and 2030 respectively

Triggering renovations in Europe is key to obtaining large energy use reductions as renovation rate is stagnating at about 1%, as indicated in the European Commission Renovation Wave Strategy.

When it comes to windows in Europe's buildings, it is estimated that more than half of them are inefficient with outdated glazing and framing[2]. Typically, windows stay on a building for more than 40 years until they are replaced by new ones. Renovation is triggered by different factors. Of these, the desire for energy saving and improving indoor comfort are two very important factors.

Accordingly, **high-performance windows play a crucial role achieving the energy-efficiency and more generally climate targets of the EU**.

As the potential energy savings related to window replacement is huge, the proposed recast of the EPBD should ask Member States to create strong incentives for the renovation of the existing building stock and their windows in a cost-effective way:

1. The European Commission should provide guidance to Member States to set specific plans to **phase out inefficient windows** in line with the Energy Efficiency First principle. For instance, specific replacement requirements for windows considering also shading and retrofitting programmes should be set up in national building renovation plans.
2. The effectiveness of (mandatory or voluntary) minimum energy performance standards (MEPS) also depend on the minimum energy performance requirements for individual building elements such as windows. Member States should be supported in establishing such requirements in line with the **energy balance principle** (see section 2).
3. Stability in financial mechanisms must be ensured and the access to them simplified. Member States must be encouraged to consider **window replacement in the list of energy efficiency measures** that are supported financially.

[2] Study "Save more energy with new windows" (May 2021) for Germany by Verband Fenster + Fassade, Frankfurt am Main, and the Bundesverband Flachglas e. V., Troisdorf

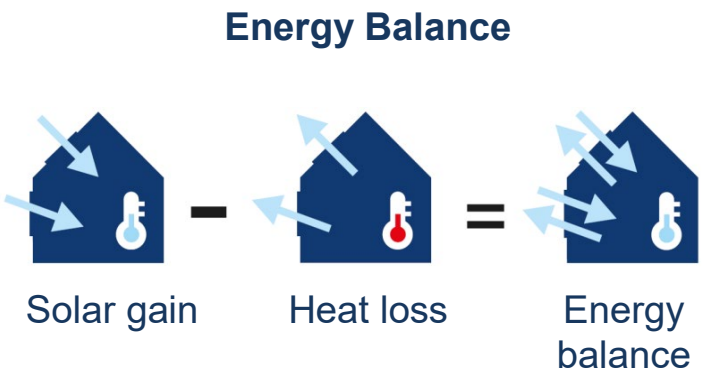
2. Using the energy balance approach to assess the energy performance of window products

As explained in Commission Recommendation (EU) 2019/1019 of 7 June 2019 on building modernisation, the consideration of building envelope elements and their influence on the energy performance of buildings also depends on the calculation methodologies applied. The recommendation gives the example of the **"energy balance"** approach, which takes into account both **energy losses** (related to heat loss) **as well as energy gains** (from passive capture of solar irradiance on buildings and building elements) when calculating the energy performance of a building or a building element of the building envelope, as an approach used in some Member States to take into account solar conditions in relation to Annex I, point 4 of the EPBD (point 5 in proposed new EPBD).

This 'energy balance' is indeed the right approach to assess the thermal performance of windows and other transparent elements of the building envelope in relation to Annex I that deals with buildings.

As a complement, our sector recommends **the "energy balance" approach** to be used also when it comes to the requirement for Member States to set **minimum energy performance requirements for building elements** that form part of the building envelope when they are replaced or retrofitted, in relation to Art. 4 §1 2nd sentence (Art. 5 in proposed new EPBD).

In addition to their insulation properties, windows provide daylight and solar heat gains to buildings and allow for natural ventilation (e.g. ventilative cooling). However, in several Member States, the assessment of the energy performance of a glazed area in cost-optimal calculation methods and minimum performance requirements are too often only based on insulation properties, i.e. the thermal transmittance (U-Value), while for the energy performance of transparent components of the building envelope, there is also the need to consider the heat gains (solar factor or g-value), the effect of solar control/shading, ventilative cooling and air permeability. For this reason, **the energy performance of a window is best assessed by the "energy balance" approach that takes into account heat losses and solar heat gains based on the local climatic and related conditions.**



Adopting the energy balance approach would give a more accurate picture of the performance of windows in their specific environments. It would allow for the energy performance of buildings to be assessed in a truly cost-optimal and realistic manner. Because it considers solar gains from windows, the energy balance approach takes into account free solar heat during the heating season, as well as overheating prevention technologies (be they dynamic shading, dynamic glazing, solar control glass etc.) during the cooling season.

The proposed recast of the EPBD is an excellent opportunity to stress the importance of applying an energy balance approach for the evaluation of transparent components of the building envelope:

1. Since 2010, **the EPBD requires Member States to take several aspects into consideration at building level**, including indoor and outdoor climate, passive solar systems and solar protection, and many others (Annex I – Point 3). These aspects are also relevant for assessing **the performance of transparent building elements like windows.**
2. Furthermore, the 2018-amended Directive makes it compulsory for Member States to take into account **the positive influence of local solar exposure conditions and active solar systems and natural lighting** (2018-amended Annex I – Point 4), the 'energy balance' being given as an example in Commission Recommendation (EU) 2019/1019.
3. In the proposed recast of the EPBD, **Members States should be guided further about the way to assess the energy performance of transparent building elements**, i.e. using the 'energy balance, thereby supporting the setting of minimum energy performance requirements for building elements according to Art 5 §1.

3. Defining and securing Healthy Indoor Climate

People spend up to 90% of their time in buildings but many existing European buildings suffer from poor daylight and indoor climate with adverse effect on health, well-being and productivity.

Our sector welcomes the introduction of health externalities in the methodology framework to identify cost-optimal levels: this new parameter will bring a significant improvement to energy and building regulations in EU by securing that Energy Efficiency do not come at the expense of health and Indoor Environment Quality.

Nevertheless, due to the outstanding share of Europeans living in unhealthy buildings (1/6th of Europeans and 1/3rd of European children[3]), we believe this major challenge of our building stock should be addressed via a strong Energy Performance of Buildings Directive, **tackling health and comfort of occupants**.

The term **"Healthy Indoor Climate"** is mentioned 4 times in the 2021 recast EPBD but has unfortunately not been defined in any of the 57 definitions available in Article 2.

To ensure a better liveability of existing buildings (via renovation and modernization) and secure the resilience of future buildings (new constructions), **we support the introduction of an ambitious definition of a Healthy Indoor Climate** in the Article 2 of the Recast EPBD and call for the inclusion of the essential parameters (as described in the EPB Standard EN 16798-1): Daylight, Indoor Air Quality, Overheating Mitigation and Acoustics.

[3] Healthy Homes Barometer, 2019

We also advocate for introducing this strong definition into the scope of Zero Emissions Buildings, Energy Renovation Passports and Energy Performance Certificates.

1. The successful improvement of the energy performance of new buildings provided by the introduction of a Nearly Zero Energy Building (nZEB) definition a few years ago was unfortunately **not accompanied by parallel goal to maintain (or improve) the well-being of occupants** and has often led to prioritizing energy over health and comfort.
1. Regarding **EPCs** – and to a certain extent, **Building Renovation Passports** – buildings owners have not yet been incentivized or sensibilized to the importance of improving the indoor climate of their buildings, due to the absence of indicators or recommendations. We recommend using the Annex V of the Recast EPBD **to introduce the key components of the "Healthy Indoor Climate" definition** into the list of mandatory indicators to be present on EPC documents.

About

ARGE is a Trade Association that represents lock and hardware manufacturers within Europe and Scandinavia. ARGE operates through an Executive Board, the 12 National Secretaries and the many Working Group Convenors. ARGE Projects and Topics which result in Industry Standards and Regulations. Lobbying and informing the European Commission is enabled due to ARGEs pan-European presence.

European Aluminium, founded in 1981 and based in Brussels, is the voice of the aluminium value chain in Europe. We actively engage with decision makers and the wider stakeholder community to promote aluminium's strategic role, secure growth, and stress our metal's contribution to meeting Europe's sustainability challenges. We do this through environmental and technical expertise, economic and statistical analysis, scientific research, sharing of best practices, and public affairs and communication activities. Our 95+ members include alumina refiners and primary aluminium producers; downstream manufacturers of extruded, rolled and cast aluminium; aluminium recyclers and national aluminium associations, representing together more than 600 plants and 1 million (direct and indirect) jobs in 30 European countries.

EPPA, the European PVC Profiles and related Building Products Association represents the manufacturers of PVC window systems and related building products in Europe. About 25,000 employees process about 1,4 million tonnes of PVC creating a turnover of €4 billion with profile systems and building products. Based in Brussels, EPPA provides a common platform for bundling national activities in the fields of PVC window technology, recycling, environment and public affairs.

ES-SO, the European Solar-Shading Organization, is the European umbrella of national solar shading and roller shutter trade associations based in Brussels. The shading industry employs over 500.000 people, mainly in Europe-based SME's, and has annual sales approaching 50 billion euros. Its high growth potential in energy savings and comfort in buildings can provide thousands of new, green jobs, widely spread over the member states, with offering of made-to-measure, smart solar shading to local markets.

EuroWindoor AISBL was founded as an international non-profit Association, in order to represent the interests of the European window, door and facade (curtain walling) sector. Our 19 national associations speak for European window, door and facade manufacturers that are in direct contact with consumers, and thereby having large insights on consumers' demands and expectations. We are at the forefront interacting with dealers, installers and consumers buying windows and doors, and the companies behind the associations cover selling all over Europe.

Glass for Europe is the trade association for Europe's flat glass sector. Flat glass is the material that goes into a variety of end products, primarily in windows and facades for buildings, windscreens and windows for automotive and transport as well as solar energy equipment, furniture and appliances. Glass for Europe brings together multinational firms and thousands of SMEs across Europe, to represent the whole building glass value-chain. It is composed of flat glass manufacturers, AGC Glass Europe, Guardian, NSG-Group and Saint-Gobain Glass Industry and works in association with national partners gathering thousands of building glass processors and transformers all over Europe.