

Implementing the amended Energy Performance of Buildings Directive: 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 **European Aluminium, EuroWindow, ES-SO, FAECF** and **Glass for Europe** are strong supporters of this framework.

Buildings account for about 40 % of the energy consumption and 36% of CO₂ emissions in the EU¹. If Europe is to achieve its decarbonisation goals and to contribute fully to the realization of the Paris agreement, reducing the energy needs from buildings is a necessity, in line with the ‘Energy Efficiency First’ principle. This can only be achieved by improving the energy performance of the envelopes of buildings² as a well-designed building is needed as the basis for other measures, such as renewable energy generation.

Following the adoption of Directive (EU) 2018/844, amending Directive 2010/31/EU, (together named ‘2018-amended EPBD’ hereafter) **European Aluminium, EuroWindow, ES-SO, FAECF** and **Glass for Europe** - would like to stress that 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 distinctive benefits of modern windows, the EPBD needs to be implemented properly, to ensure the energy performance of glazed areas is fairly assessed and to put in place the right mechanisms and incentives for market actors to deliver massive energy savings.

The 2018-amended EPBD is a unique opportunity to optimise the energy performance of buildings, as well as optimise cost savings. Our sector considers that the following key objectives should be pursued:

- 1. Increasing the replacement rate of windows** as part of the long-term renovation strategy.
- 2. Using the “energy balance” approach to assess the energy performance of windows.**
- 3. Recognising the benefits of daylight, natural ventilation and solar management.**

¹ <https://ec.europa.eu/energy/en/topics/energy-efficiency/buildings>

² Annex I - point 2 – 3rd paragraph of 2018-amended EPBD: “... Member States shall ensure that the optimal energy performance of the building envelope is pursued.”

1. Increasing the replacement rate of windows as part of a long-term renovation strategy

The EPBD has helped to improve the energy performance of new buildings but has not significantly improved the building envelope of existing buildings since the rate of building renovation in the EU is low and stagnating (<1.2% per year).

Triggering renovations in Europe is key to obtaining large energy use reductions as new buildings do not represent more than 1,5% of the European housing stock. The undersigned associations therefore fully support the new Article 2a on long-term renovation strategy.

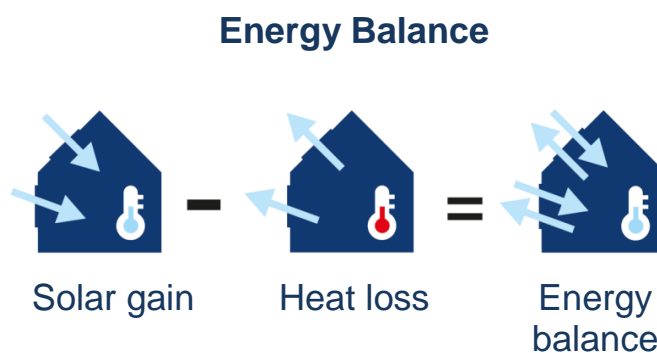
When it comes to windows, it is estimated that 85% of glazed areas in Europe's buildings are inefficient with outdated glazing (for example, single glazing or early uncoated double glazing), and additionally with outdated framing (with poor airtightness, for example). Typically windows stay on a building for 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.

As the potential energy savings related to window replacement is huge, the 2018-amended EPBD should 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. For instance, specific replacement requirements for windows or retrofitting programmes should be set up in national long-term renovation strategies.
2. In order to boost investments in energy efficient renovation projects, Energy Performance Certificates (EPCs) should evolve to become a building passport, providing tailor-made recommendations for gradual energy efficiency and indoor comfort improvements. EPCs should include an assessment of energy performance improvements induced by new windows based on the energy balance (*see chapter 2 below*). This will trigger financial investments for truly cost-optimal component replacement.
3. A long-term policy framework regarding energy efficiency in buildings should be in place to support investments in energy savings:
 - Stability in financial mechanisms must be ensured and the access to them simplified.
 - Subsidies for component replacement should be linked to energy efficiency requirements tailored to the local needs and environment, and based on the windows' energy balance (*see chapter 2 below*).
 - Member States must be encouraged to consider window replacement in the list of energy efficiency measures that are supported financially.

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

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/protection and air permeability. For this reason, the energy performance of a window is best assessed by the “energy balance” approach, which is an equation that takes into account heat losses and 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 implementation of the 2018-amended 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).
3. The European Commission Guidance Document should explain how Member States can properly implement this approach in practice and should recommend energy balance equations to be defined by each Member State to account for specific heating, cooling and climatic contexts while securing cost-optimality.

3. Recognising the benefits of daylight, natural ventilation and solar management

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.

Member States should include in their cost-optimal calculations the economic benefits provided by daylight in terms of reducing energy consumption for lighting: this parameter is already taken into account when it comes to evaluating the energy performance of commercial buildings and should therefore be extended to residential dwellings. Additionally, the benefits of daylight and views to the outside world for humans are well documented.

Furthermore, as summer comfort is becoming more and more important in Europe, overheating prevention technologies (be they dynamic shading, dynamic glazing, solar control glass, etc.) and natural ventilation, including the benefits of automatic window opening, should also be taken into account. It improves indoor air quality, reduces energy consumption for buildings equipped with air conditioning and improves comfort for buildings not equipped with air conditioning.

Therefore, specific measures should be incentivised at Member State level to ensure appropriately glazed buildings that increase the comfort and well-being of occupants:

1. The 2018-amended EPBD encourages Member States to address the issue of healthy indoor climate conditions (amended Article 7 – 5th paragraph) and requests energy needs to be calculated in order to optimise health, indoor air quality and comfort levels defined by Member States (2018-amended EPBD Annex I – point 2)
2. Member States should put in place within their national building codes and/or building compliance tools accurate calculations and requirements on daylight (daylight factor³ or sufficient minimum glazed surface to floor ratio) and indoor climate (thermal comfort, indoor air quality, natural ventilation). The benefits of automatic controls should be included in calculations⁴.
3. In its Guidance Document, the European Commission should invite Member States to act according to the above two items.

³ Daylight factor should be based on the new standard EN 17037 'Daylight of Buildings'

⁴ Also relevant for the upcoming Smart Readiness Indicator (art.8, 10 EPBD 2018/844).



About

European Aluminium, founded in 1981 and based in Brussels, is the voice of the aluminium industry in Europe. We actively engage with decision-makers and the wider stakeholder community to promote the outstanding properties of aluminium, secure growth and optimise the contribution our metal can make to meeting Europe's sustainability challenges. Through environmental and technical expertise, economic and statistical analysis, scientific research, education and sharing of best practices, public affairs and communication activities, European Aluminium promotes the use of aluminium as a material with permanent properties that is part of the solution to achieving sustainable goals, while maintaining and improving the image of the industry, of the material and of its applications among their stakeholders.

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.

EuroWindow AISBL was recently founded as an international non-profit Association, in order to represent the interests of the European window, door and facade (curtain walling) sector. Our 17 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.

FAECF, la Fédération des Associations Européennes des Constructeurs de Fenêtres et de Façades (the European Federation of National Window and Curtain Walling Manufacturers' Associations), was founded in 1968 and celebrates fifty years of operation in 2018. The main objectives of FAECF are to promote and defend the European fenestration industry in its chosen markets. It contributes to harmonization in fenestration standards and provides technical information to the value chain.

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, Saint-Gobain Glass and Siseçam-Trakya Cam, and works in association with national partners gathering thousands of building glass processors and transformers all over Europe.