

Public consultation on the Advanced Materials Act

In its February 2024 communication¹, the European Commission explicitly recognised ‘**dynamic optically transparent and glazing technologies**’ as advanced materials.

These technologies qualify as advanced materials as they **enable energy-efficient buildings and clean mobility, enhance occupant wellbeing, and increase circularity and overall environmental performance.**

Flat glass is an **irreplaceable construction material** which brings essential natural daylight and a connection with the outdoor. High-performance glazing enhances thermal comfort in both winter and summer while significantly reducing energy consumption. It also supports on-site renewable energy generation through solar panels and Building-Integrated Photovoltaics (BIPV).

Flat glass is also an **integral part of most automotive vehicles**. Windscreens, backlights and windows for cars and all types of vehicles provide safety, security, durability, excellent visibility and allow modern design and greater comfort for passengers. As the future of transport requires advanced interconnected technologies, glass already allows the integration of sensors, cameras, antennas, GPS and several other functionalities in an invisible way. Glass delivers advanced solutions for automated-driving and improved experience with augmented reality features on windshields.

The flat glass and glazing industry continuously develop **higher performance and innovative products** to deliver enhanced functional performance, including improved thermal insulation and reduction of heating and cooling needs, solar control, circularity and integration with energy systems.

The EU flat glass sector supplies **advanced products necessary to achieve the European Union’s decarbonisation, strategic autonomy and economic security objectives.**

The forthcoming Advanced Materials Act must build on the European Commission’s communication² and support the **production and deployment of optically transparent and glazing technologies.** To do so, it must:

- ▶ Address the lack of European **competitiveness relative to imports from outside the EU** by ensuring a fair level playing field.
- ▶ **Promote the benefits of advanced glazing technologies** in reducing energy demand in buildings and generating local renewable energy
- ▶ Support the development of **closed-loop recycling systems** for flat glass product

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 entire building glass value-chain. It is composed of flat glass manufacturers, AGC Glass Europe, Guardian, NSG-Group, Saint-Gobain Glass Industry and Şişecam, and works in association with national partners gathering thousands of building glass processors and transformers all over Europe.

¹ Communication ‘Advanced Materials for Industrial Leadership’, 27 February 2024, available here

² Ibid

Restore a business case for advanced glazing technologies manufacturing in Europe

The manufacturing of advanced glazing products is constrained by the need for **capital-intensive processes** and access to specialised coating and lamination equipment.

These challenges are further exacerbated by the structural characteristics of the flat glass sector. A flat glass furnace functions in a continuous manner, without any possible interruption, typically for 16-20 years. During this time, only maintenance operations and limited modifications can be implemented.

The need to **enable research and innovation to develop higher performance products** while **lowering manufacturing emissions** significantly amplifies investment requirements. Yet the ability to make such investments is undermined by persistently **high production costs** and an increasingly **competitive global environment**.

To address these challenges, the Advanced Materials Act should introduce targeted measures that **de-risk investments** in production lines, including **support for pilot-to-industrial scale transitions** of flat glass furnaces to embed advanced glazing technologies.

The success of **industry-led research and innovation programmes will be crucial** for sustaining production in Europe, contribute to innovative and sustainable mobility and decarbonised building stock. Priority support should be provided to sectors that need to bridge the transformation gap but currently lack the necessary technologies.

Furthermore, the Act should **facilitate access to research and technology infrastructures and funding** and reinforce workforce development programmes in materials science, process engineering, and digital manufacturing.

Support the uptake of advanced glazing technologies

Despite the objective of doubling annual energy renovation rates in the EU by 2030³, and the availability of advanced glazing products across the EU market, **demand has been steadily declining**⁴. The challenges faced by the automotive sector have also had a significant impact on demand for innovative glazing products.

The flat glass sector is being severely hindered by this **general lack of demand** and **rising imports of flat glass products from outside** the European Union.

However, these difficulties have not stopped the flat glass industry to keep on developing advanced products which are key in reducing energy use in building, supporting clean mobility and contributing to generating on-site renewable energy.

For instance, the **European building stock is increasingly vulnerable to overheating** due to rising average temperatures, more frequent heatwaves, and insufficient adaptation of existing structures. **Passive cooling strategies** such as the **management of solar gains through solar control glazing** offer an efficient and cost-effective means to mitigate these impacts.

Similarly, innovations, such as electrochromic and thermochromic glass regulate solar gain and interior temperature by changing tint in response to electric signals or heat. The EU-funded *Switch2Save* project has recently demonstrated that installing **dynamic glazing** in two European buildings **reduced**

³ Set in the European Commission Renovation Wave Strategy, available [here](#)

⁴ Between 2019 and 2024, sales of insulating glass have dropped by over 4%.

peak cooling demand by up to 80%⁵ in certain periods. This is especially relevant in the context of increasing climate extremes, as it alleviates stress on electricity systems and reduces dependence on carbon-intensive cooling technologies.

Such technologies are also useful in the mobility sector. High-performance solar-control and electrochromic glazing reduce heat and glare, which significantly lowers reliance on air conditioning and improves energy efficiency⁶.

Innovative glazing technologies are also transforming glass into an active system rather than a passive surface. Advanced windshields now integrate augmented and virtual reality displays to **deliver real-time navigation and safety information directly in the driver's line of sight**, enhancing situational awareness while reducing distraction. Such developments position automotive glazing as a key enabler of smarter, safer, and more sustainable mobility.

Today's **advanced glazing solutions can actively support electrification** through multiple pathways. For example, Building-Integrated Photovoltaics (BIPV) mean that flat glass can be transformed into energy-generating surfaces by embedding photovoltaic cells directly into façades, curtain walls, or windows. BIPV enables on-site renewable electricity generation without occupying additional land. This not only contributes to energy autonomy but reduces grid demand and supports decentralised electrification strategies.

The uptake of advanced glazing technologies should be explicitly considered within the Advanced Materials Act, given their cross-sector impact on buildings, mobility, and energy generation. Including glazing within the scope of the Act could help accelerate innovation, industrial deployment, and systemic sustainability benefits across multiple value chains.

Improve circularity systems to support advanced glazing technologies

Closed-loop recycling systems are the most beneficial end-of-life option for flat glass, an indefinitely recyclable material. Data indicates that around 1.5 million tonnes of post-consumers broken, and waste glass is generated annually in the EU. Yet, it is estimated that **today only 5% of end-of-life glass is effectively recycled** into new flat glass products⁷. This is mostly due to the **insufficient dismantling and sorting of old windows, façades, balustrades** and automotive glass as well as the complexities associated with the high level of purity required to recycled glazing technologies.

Closing the loop will **reduce the use of raw materials, energy and CO₂** in glass manufacturing, while supporting manufacturers to develop **products with a lower carbon footprint**. This will contribute to the EU's objective of achieving climate neutrality and the sustainable objective the Advanced Material Act.

Circularity is currently hampered by numerous hurdles, such as **low landfill prices, fragmented waste legislation** across the EU including significant **bureaucracy attached to cross-border shipments of by-products**. These regulatory bottlenecks could be addressed in the future Advanced Materials Act as well as other more specific legislations such as the Circular Economy Act.

⁵ Two buildings – a hospital in Greece and an office in Sweden – were selected for a two-year study comparing energy use before and after the installation of dynamic glazing. In Sweden, peak cooling demand was reduced by up to 80% during certain periods while in Greece, dynamic glazing lowered indoor temperatures by up to 8°C and reduced cooling energy use by 28% significantly improving comfort for patients. More information available here: <https://switch2save.eu/>

⁶ Advanced glazing systems to curb air-conditioning energy consumption, Glass for Europe, 2023, available [here](#)

⁷ Economic study on recycling of building glass in Europe, Deloitte, 2016,

Glass for Europe's priorities on this topic are the following:

- ▶ Recognise the **status of 'by-product' for pre-consumer cullet** (waste or broken glass)
- ▶ Strengthen provisions for **mandatory pre-demolition audits**, including recommendations for sorting and recycling by type of glass
- ▶ Support a **progressive ban on landfilling of recyclable flat glass products**