From flat to circular: Rethinking glass in construction

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Executive Summary

Flat glass plays a vital role in the EU's transition towards a circular and decarbonised economy. **With approximately 10 million tonnes of flat glass placed on the market annually - 80% of which is used in the building sector**[1] - its end-of-life management presents both a challenge and an opportunity. While the **environmental benefits of flat glass recycling are well established, the current recycling rate into new flat glass (closed-loop recycling) remains marginal**[2]. Unlike container glass, for which long-established collection systems exist, **flat glass from construction and demolition** (C&D) sites is **often** not selectively collected and is instead **mixed with other materials such as wood, metals, PVC, and hazardous substances**. This contamination, combined with the lack of dedicated collection and sorting systems in most Member States, significantly limits the recyclability of flat glass waste (FGW). Moreover, **there are currently no specific EU recycling targets for flat glass**, despite its technical recyclability and potential contribution to circular economy goals. High quality requirements for flat glass cullet, high transport costs, and low landfill taxes further hinder progress.

In this context, we call for the implementation of effective and targeted measures to improve flat glass circularity in Europe, including:

- The mandatory use of pre-demolition audits and selective demolition, in line with the 2024 revised edition of the EU Construction and Demolition Waste Management Protocol.
- The development of national collection targets for flat glass as a key driver to improve recycling rates.
- The establishment of minimum recycled content target of 15% for flat glass to help create a more stable demand and offer for glass cullet.

[1] Glass for Europe, key data (available here)
[2] Deloitte, 2016, Economic study on recycling of building glass in Europe (available here)

- The promotion of best practices for uncontaminated collection and sorting at source, including the use of dedicated containers or other collection methods that keep the glass intact and ensure access for individuals to municipal container parks.
- A strong traceability system to ensure that recycled content genuinely originates from EU waste streams and to prevent fraudulent imports of falsely labelled materials.
- Opposition to the establishment of an EU-wide EPR system for flat glass, which risks undermining the proper management and control of recyclers over material flows, which is essential to ensuring quality and efficiency. The obligation of the final user or builder to deliver the waste to an authorised waste manager must be emphasised.
- Fostering collaboration across the entire value chain - from manufacturers, property owners, demolishers and recyclers - is essential to create conditions for proper collection, sorting and treatment.

Environmental benefits of recycling

Recycling flat glass is the most environmentally and economically advantageous end-of-life solution for building glass and glazing[3]. Beyond reducing waste, it significantly lowers energy consumption and CO_2 emissions in glass manufacturing. Using recycled glass - known as cullet - reduces the need for virgin raw materials and enables furnaces to operate at lower temperatures. This results in a smaller carbon footprint for the final product and supports the EU's climate goals. Additionally, it contributes to the EU's strategic autonomy by retaining raw materials while preserving and strengthening European industry.

The use of 1 ton of cullet saves approximately 1.2 tons of virgin raw materials such as sand, dolomite, soda ash and limestone. Using cullet also reduces process-related emissions. As it has already undergone the mineralisation process, it releases fewer greenhouse gas emissions during melting than virgin raw materials. Every ton of cullet used allows to avoid the need for 2 million BTUs (586 kWh) of natural gas and to reduce up to 700 lbs (318 kgs) of CO2 emissions[4]. Between 2010 and 2018, the average share of cullet used in flat glass production in Europe increased from 20% to 26%. However, considerable potential remains,

[3] Glass for Europe paper on 'Reuse, remanufacturing, recycling: the case of glass for buildings' (available here)
[4] Guardian Glass (available here)

particularly from construction and demolition waste, of which only a tiny fraction is currently recycled into flat glass.[5]

Ensuring good practices for activating FG circularity

A critical issue affecting flat glass recycling in the construction sector is the current practice of collecting and storing FGW together with mixed construction and demolition waste (CDW) at renovation and demolition sites. Selective demolition is a common practice across Member States, supported by mandatory pre-renovation and pre-demolition audits in national waste legislation. However, **traditional demolition remains in practice. This practice leads to significant contamination of FGW - both from inert and non-inert materials - as well as from hazardous organic pollutants**. Such contamination severely compromises the quality of the collected glass and makes it extremely difficult to meet the technical specifications required for furnace-ready cullet (FRC), which is essential for closed-loop recycling into new flat or container glass.

As a result, a significant share of flat glass waste exits the glass recycling loop entirely and is instead diverted to lower-value applications, such as incorporation into recycled aggregates or, even ends up in landfills. This represents a major loss of valuable material and undermines the EU's circular economy and decarbonisation objectives.

Therefore, we call for the following measures:

- **Setting a minimum 15% recycled content target for flat glass buildings products** – excluding internal cullet – to stimulate investment in the required collection infrastructure by creating a stable demand. Growing demand will, in turn, drive the expansion of recycling facilities capable of producing high-quality cullet. This requirement could also be integrated into Green Public Procurement (GPP) criteria. All the production residues generated in the production plant and directly re-introduced in the production process cannot be accounted towards the minimum recycled content target. Post-industrial, pre-consumer and post-consumer waste all generated outside of the production plants shall be included in the accounting for the above-mentioned minimum recycled content target.
- Actively **promote selective demolition by implementing mandatory pre-demolition audits**, as outlined in the updated edition of the Waste Management Protocol (2024). This protocol requires

[5] Deloitte, 2016, Economic study on recycling of building glass in Europe (available here)

Member States not only to establish sorting systems for various CDW streams - including flat glass - but also to ensure that hazardous waste is neither diluted nor mixed with other hazardous wastes or with non-hazardous waste, substances, or materials.

- These pre-demolition audits should **verify the quality of glass throughout the entire demolition process**, assessing whether flat glass is dismantled properly to meet recycling criteria. The audits must clearly specify which waste fractions should be sorted and stored separately - preferably in dedicated, clean containers - thereby avoiding the use of multi-purpose containers that increase contamination risks.
- Given that selective demolition requires additional time and resources compared to traditional demolition, it is advisable to **set a minimum glass surface size threshold of 2,000 m² for renovation and demolition sites subject to these requirements**. This approach aligns with the EU Taxonomy criteria for construction and renovation activities, which establish a minimum useful floor area threshold for applicable sites[6].
- **Public authorities and municipalities** can play a crucial role in promoting flat glass recycling by implementing corrective measures and keeping logistics costs manageable. To support proper collection of flat glass waste and prevent contamination from other construction and demolition waste, individuals must be provided with access to publicly accessible flat glass containers, or to other collection methods that keep the glass intact, which can be managed either by the municipality or by private recycling companies.
- **Professionals or companies** carrying out construction, renovation or demolition works must always deliver it to an authorised waste manager to ensure proper traceability and treatment of FGW.
- Furthermore, enhanced communication and coordination among **all actors in the flat glass value chain** including treatment center and recycling plants, site and project managers, and glass manufacturers can help increase recycling rates. Improved information sharing, including towards individuals, would reduce the risk of material rejections and optimise the recyclability of collected glass, thereby supporting circular economy objectives.

[6] Based on activity B3. Energy efficiency renovations of existing buildings, Technical guidance on applying the 'do no significant harm' principle under the Social Climate Fund Regulation (C/2025/1596) (available here)

Ensuring instruments to support FG circularity

Economic incentives

It is essential to establish rules that unlock the steering potential of Value Added Tax (VAT) for recycled products, as this can play a key role in stimulating recycling. Therefore, a 50% input VAT deduction limit is proposed for flat glass products that do not meet the 15% recycled content target, in order to encourage the purchase of products containing recycled materials.

Green Public Procurement (GPP)

Representing 14% of the EU's GDP and €2.4 trillion annually, public procurement plays a crucial role in the European economy. The introduction of mandatory sustainability requirements in public procurement rules is essential to stimulate demand for recycled materials and to advance the EU's decarbonisation objectives. Given that 31% of public works are financed by public authorities[7], Green Public Procurement (GPP) is a key instrument to drive the uptake of recycled materials and support the European recycling industry - particularly by promoting circularity in the construction sector.

However, in the case of flat glass, the **issue of traceability and material origin** is critical. There is a **risk that virgin materials could be falsely labelled as recycled** - an issue previously observed with recycled plastics in the Packaging and Packaging Waste Regulation[8]. To ensure that GPP measures genuinely support the EU flat glass recycling industry, it is therefore essential to establish **robust traceability and verification mechanisms together with the implementation of mandatory recycled content requirements.** This will support recycled content originating from within the EU and directly contributes to strengthening European recycling capacities and industrial autonomy.

EPR schemes

Before considering the implementation of an Extended Producer Responsibility (EPR) scheme for a specific waste stream, it is essential to **conduct a comprehensive assessment** of the existing collection, sorting, and

[7] Brussels School of Governance, Roundtable Event: Public Procurement of Steel and Cement in Construction - Creating a Lead Market for Green Materials (available here)
[8] Recycling Europe, "urgent actions required to protect the European recycling industry from unfair competition linked to massive imports of plastics labelled as recycled" (available here)

recycling value chain. This is necessary to avoid placing undue burdens on waste management and recycling operators, many of whom are already engaged in efficient, market-driven recovery processes.

Independent third-party assessments at the Member State level are crucial to objectively evaluate the full range of costs incurred by stakeholders across the entire value chain. These should include costs related to collection, storage, depollution, raw material recovery (e.g., shredding and post-shredding processes), and the final treatment of residual waste, such as landfilling or energy recovery. Such studies make it possible to determine whether alternative policy instruments - such as specific treatment or collection targets, recycled content requirements, or deposit return systems (DRS) - may represent a more proportionate and effective means of meeting waste management and circular economy objectives.

In the case of flat glass, it is essential that no Extended Producer Responsibility (EPR) scheme be established at the EU level. The flawed implementation of France's EPR scheme for construction products and building materials (PMCB) has already demonstrated the risks of such an approach**. For glass recyclers, it is absolutely critical to retain ownership of flat glass waste**. This ownership allows them to manage and organise their own distribution flows, choosing the partners they wish to work with and determining whether material is directed towards flat glass or container glass recycling streams. Such flexibility is key to ensuring efficient and high-quality recycling operations.

Note to editor:

Recycling Europe (formerly EuRIC) is the voice of Europe's recycling industry, including 80 national federations and companies across 24 EU & EFTA countries. From metals and paper to plastics, textiles, tyres, ships, construction & demolition waste, ELVs and WEEE, our members transform waste into resources—powering Europe's circular economy, ensuring resource autonomy, and boosting competitiveness and sustainable industrialisation across the continent. For press-related enquiries, please contact Zoi Didili, Recycling Europe's Senior Communications Advisor, by email at zdidili@recyclingeurope.org or by phone at +32 (0) 489 09 46 02.

Recycling Europe Construction & Demolition represents the European construction and demolition waste recycling industries to European institutions and collaborates with other European and international stakeholders, supported by other EuRIC branches.

As the European federation of glass recycling companies, FERVER brings together industry leaders from 19 countries and its members are, amongst others, responsible for recycling around 70% of Europe's packaging glass waste into high-quality cullet – a key raw material used to produce new glass products. FERVER members recycle both container glass and flat glass. FERVER therefore plays a vital role in closing the loop for glass and advancing circularity across Europe.

FEAD is the European Waste Management Association, representing the private waste and resource management industry across Europe, including 20 national waste management federations and 3,000 waste management companies. Private waste management companies operate in 60% of municipal waste markets in Europe and in 75% of industrial and commercial waste. This means more than 500,000 local jobs, fuelling €5 billion of investments into the economy every year.