

MORE SUSTAINABLE CONSTRUCTION WITH PLASTIC MATERIALS

Executive summary:

Improving the sustainability of European buildings, newly built or renovated, is an essential component of the EU's drive for a resource efficient and decarbonised Europe. The Modern Building Alliance believes the below enhancements could lead to a more sustainable building stock:

1- Assessment of the environmental impact of construction should be based on a lifecycle analysis performed at the building level. Environmental impacts go beyond GHG emissions and include repercussions on air, land and water, and range from raw material extraction, the manufacturing of products and equipment to transport, construction techniques and the way we deal with the end of life of the building components. **A material neutral, performance based and life cycle-oriented approach** will improve the sustainability of buildings.

2- Buildings are meant to last decades and 80% of today's European building stock will still be in use in 2050. In the case of construction, performance of the system components and durability of such performance should go hand in hand and be seen together as an essential part of buildings' contribution to a more resource-efficient economy.

3- Support for "Level(s)", an EU initiative aimed at bringing tools to assess the sustainability of our buildings and making a clear contribution to broader European environmental policy objectives.

Buildings have a significant impact on the environment, whether during their use phase (with their energy consumption well visible to end-users), their construction or end-of-life phase. To reduce this impact, several stakeholders, such as construction product manufacturers, architects, building owners and managers, have a role to play, particularly when looking at new buildings or important renovation projects, starting during the design phase and continuing throughout the lifetime of a building.

Plastic materials have been, and continue to be, an essential part of the sustainable solutions as they offer a unique combination of performance, reliability, durability and cost-effectiveness.

A life-cycle approach at the building level should be the starting point

Buildings are made to last, often with an average lifetime of 50 years or longer. During their long lifespan, they represent 40% of energy consumption and 36% of carbon dioxide (CO₂) emissions in the EU¹, mostly driven by energy needed to heat, cool or run them. Sustainability encompasses other environmental impacts beyond CO₂ or GHG emissions, including water use and potential contamination, land use (including deforestation) and air pollutants. These impacts do not only occur during the use phase of buildings, that is the most visible part to

¹ European Commission, "The Commission Presents Strategy for a Climate Neutral Europe by 2050 – Questions and Answers.", 2018, [http://europa.eu/rapid/press-release MEMO-18-6545_en.htm](http://europa.eu/rapid/press-release_MEMO-18-6545_en.htm)

occupants, but at each life cycle stage of the building, from design, to individual component production and transport to site, and from actual construction to the end of life after use phase.

Today, construction and demolition waste, together with a large quantity of excavation waste, account for 25-30% of all waste generated in the EU², but cause about 2% of the overall environmental footprint of a building³.

Therefore, the environmental impact of buildings matters, but it needs to be measured looking beyond the performance of individual components. Construction products, equipment and materials must be assessed in view of their intended applications and the entirety of their life-cycle (cradle-to-grave). It is key decision-makers ensure life-cycle performance to underpin all policies in the field of sustainable building and promote a neutral and fair approach to construction products and materials. Only the use of a life-cycle approach will allow customers or building planners to choose the most environmentally sustainable options as early as possible in the design phase.

Nearly zero energy buildings (nZEB) are becoming the norm under the EU Energy Performance of Buildings Directive⁴ (EPBD), and the relative impact of construction materials in the overall environmental balance of buildings is increasing. While additional insulation, triple glazing windows, ventilation systems, and photovoltaic or solar thermal systems require resources, including energy in their production, they also help to drastically reduce the resource consumption of the building over its lifetime, achieving a significantly better net environmental performance⁵. For instance, plastic insulation can save more than 135 times the energy used in its manufacture⁶.

Performance, durability of such performance and circularity should go hand in hand

The drive to improve the circularity of our economy in the past few years has led to an increased focus on recycling and to the favouring of the use of some materials over others. However, in the case of construction products, performance and their durability are essential in contributing to more resource-efficient buildings. Decisions that can affect the durability of performance (from mechanical to thermal stability) must be taken in full knowledge of potential trade-offs (like more frequent replacements or labour-intensive application techniques).

Plastic construction products like insulation, pipes and windows are highly durable: the typical lifespan of plastic applications in building and construction is 30-50 years, with many plastic pipes installed over 50 years ago continuing to function well today. Plastic materials are also easily installed and require low maintenance. This high level of performance is delivered in a cost-effective way, which makes plastic materials an optimal solution for sustainable buildings.

While some construction materials already have cost effective end-of-life pathways, this is not a universal truth. For most materials, transportation costs, sorting/recycling facilities and market competition with virgin raw materials remain important parameters. Building on their

² European Commission, "Construction and Demolition Waste (CDW)", August 2018, http://ec.europa.eu/environment/waste/construction_demolition.htm

³ Nemry and Uihlein, "IMPRO-Building - Environmental Improvement Potentials of Residential Buildings", 2008, JRC EC

⁴ European Union, "Directive (EU) 2018/844 of the European Parliament and of the Council of 30 May 2018 Amending Directive 2010/31/EU on the Energy Performance of Buildings and Directive 2012/27/EU on Energy Efficiency", June 2018.

⁵ European Commission, "Energy Performance of Buildings", January 2015, https://setis.ec.europa.eu/system/files/Technology_Information_Sheet_Energy_Performance_of_Buildings.pdf

⁶ PU Europe, "Factsheet: Environmental product declaration (EPD) for PU (PUR/PIR) thermal insulation boards and energy saving potential", May 2014 <https://bit.ly/2NumA2d>

outstanding performance during their use phase, plastic material supply chains are actively working on increasing their recycling options from straight product reuse to various recycling solutions (including chemical recycling) and energy recovery. In 2018, around 26% of post-consumer plastic waste from building and construction in EU went to mechanical recycling, 48% to energy recovery and 26% to landfill⁷.

Several tools exist, and others are being developed to identify the appropriate sustainable solutions for our buildings

Making buildings more sustainable requires consideration of broader environmental goals as well as customer/national preferences. Life-cycle approach (LCA) practitioners can refer to Environmental Product Declarations (EPDs)⁸ which contain, in a standardised format, LCA usable data for a given construction product or system. Many companies have communicated specific EPDs to the market for their construction products, such as thermal insulation, floor coverings and windows. In several countries, EPDs are required to obtain green building labelling and can be taken as the basis for the justification of environmental claims. The experience gathered by environmental footprint experts has proven that materials or products should not be compared or preselected without considering their application⁹.

The EU has been working on further initiatives which would increase the sustainability of our buildings. Several national or commercial building rating systems have been launched over the past years, such as BREEAM (UK) or LEED (US). In 2017, the EU developed “Level(s)”^{10, 11}, a common EU framework of core indicators for the sustainability of office and residential buildings. The Modern Building Alliance supports this framework, which provides a general language of sustainability for buildings, enabling actions that can make a clear contribution to broader European environmental policy objectives.

Within sustainability policy, there are other EU initiatives such as the EU Guidelines for audits before the demolition of a building¹² and the Construction and Demolition Waste Management Protocol¹³ focusing on the end-of-life of buildings. The Modern Building Alliance welcomes those workstreams to improve the sorting of waste and to thereby implement the waste hierarchy. Still in that vein, the drafting by the European Commission of the “Design for Deconstruction” principles in building design is also a step in the right direction.

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⁷ Data estimated by Conversio Market & Strategy GmbH for PlasticsEurope
<https://www.plasticseurope.org/en/about-plastics/building-construction>

⁸ EPDs are issued against the European standard EN 15804, see <https://www.construction-products.eu/news-events/latest-news/centc-350-plenary-meeting-2018>

⁹ Part of the key learnings from a Product Environmental Footprint pilot project supported by the European Commission http://ec.europa.eu/environment/eusssd/smgp/PEFCR_OEFSSR_en.htm#final

¹⁰ European Commission, “Level(s).”, 2019, <http://ec.europa.eu/environment/eusssd/buildings.htm>

¹¹ Construction Products Europe, “LEVEL(S) – position paper.”, Nov. 2017, <https://www.construction-products.eu/publications/position-papers/levels>

¹² European Commission, “EU Guidelines for audits before the demolition of a building”, May 2018, <https://ec.europa.eu/docsroom/documents/29203/attachments/1/translations/en/renditions/native>

¹³ European Commission, “Construction and Demolition Waste Management Protocol”, September 2018, https://ec.europa.eu/growth/content/eu-construction-and-demolition-waste-protocol-0_en

About the Modern Building Alliance

We're an alliance of trade associations and companies representing the plastics industry in the construction sector. Plastics are increasingly used in building and construction applications to make our buildings more sustainable, from window frames and durable pipes to state-of-the-art insulation solutions. An essential pillar of our cause is the ambition for greater fire safety across the construction industry. It is a key driver of our product design and manufacturing: improving the fire safety in buildings is a joint responsibility of the whole value chain involved in building and construction. That's why, by engaging with policy makers and stakeholders, we are committed to supporting the EU in ensuring safe and sustainable construction for people across Europe.

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