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5 April 2022

EEB Position Paper on the Energy Performance of Buildings Directive 2010/31/EU proposal

Executive Summary

The European Environmental Bureau (EEB) welcomes that reducing greenhouse gas emissions from buildings is part of the performance of buildings in the European Commission's proposal for the Energy Performance of Buildings Directive (EPBD). The building stock's impact on achieving a climate-neutral Europe by 2050 is crucial, and a clear roadmap should be defined toward its decarbonisation. However, the current proposal fails to this end as it does not establish a blueprint to reduce both 50% direct CO2 emissions and 60% indirect power generation emissions generated by buildings by 2030, to achieve a reduction of net greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels[1] and other intermediary milestones aligned with the Paris agreement. Moreover, the performance of buildings should include an effective reduction in both embodied and operational emissions. Still, the current proposal focuses on the operational phase of buildings and only sets targets for Whole Life Carbon (WLC) reporting. In order to halve buildings emissions by 2030, embodied carbon, which mainly comes from the material used in new construction and energy renovation processes, must be reduced by at least 40%[2].

The EPBD is the main EU policy that could address the reduction of GHG emissions at the building level. Hence, the EPBD revision should integrate a WLC approach that could effectively decarbonise the building stock and, for this purpose, the EEB calls for EU institutions and Member States to:

- Establish a **regulatory framework** such as the revision of the Zero Emissions Buildings definition, buildings requirements and a timeline to guarantee that the **1.5 degrees are not exceeded**, including a low carbon implementation of the **Renovation Wave** via 'headline' targets across the lifecycle of buildings.
- Establish an **ambitious Whole Life Carbon (Lifecycle Global Warming Potential) roadmap**, requirements for setting targets, benchmarks, and limits to reduce embodied and operational emissions by 2030. **Reporting on WLC** should be mandatory for all new public and large non-residential buildings and major renovations by 2024 and for all buildings by 2027. **Setting benchmarks and limits on WLC** should be established by 2026, ensuring its implementation by 2028.
- Include a dedicated article for instruments and **strategies that contribute to reducing Whole Life Carbon emissions**, such as circularity, sufficiency and the use of low carbon and natural-based materials. The **circular economy and sufficiency approaches** should be integrated within the EPBD, setting targets and establishing requirements for their implementation by 2025.
- Ensure the decarbonisation of the operational phase of buildings, including a deadline **to phase out fossil fuels from heating and cooling** systems across the EU by 2025.

[1] European Green Deal: Commission proposes transformation of EU economy and society to meet climate ambitions.

[2] UN Environment Programe. 2021 Global Status Report for Buildings and Construction

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Timeline for Whole Life Carbon and Circularity.

The EPBD should mandate a clear signal to ensure the decarbonisation of the building stock by defining a clear roadmap and timeline for including a WLC approach, circularity and sufficiency:

- **2024 - WLC reporting:** Mandatory WLC measurement and reporting for all new public and large non-residential buildings and major renovations by 2024 and for all buildings by 2027.
- **2025 - Short-term European-level WLC targets:** Set short-term European-level targets for new buildings and all buildings and all major renovations by 2025.
- **2025 - Circular and sufficiency targets:** Set targets for the implementation of circular and sufficiency measures and minimum requirements for the use of secondary materials in both new buildings and renovations.
- **2025 - Fossil fuel heating and cooling (H&C) systems** are banned from the market for new constructions and renovations**.**
- **2026 - National WLC targets:** Members States set targets and establish thresholds and minimum requirements for different climatic zones and building typologies by 2026, ensuring its implementation by 2028 at the latest.
- **2030 - European targets and WLC limit values** (per sq metre) for different climatic zones and building typologies, implementing WLC requirements based on the Level(s) framework[3] and EN 15978-1**.** The EPBD includes European thresholds and direct limits on operational and embodied emissions to decarbonise the building stock, combining and improving the European and Member States' roadmap on carbon emissions.

Decarbonisation of the European building stock

Lifecycle thinking review: Whole Life Carbon and circularity

The current European Commission proposal should be revised to include a WLC and circular approach through the document, integrating the points mentioned above on targets and requirements:

Article 2 Definitions	Include clear definitions to ensure the integration of the WLC in the directive: "Zero Emissions Buildings" should be modified to Zero Operational Emissions Buildings, and a clear definition framework to include embodied emissions should be created (see the *Definitions* chapter); the 'digital building logbook" term should include a reference to the WLC data of the buildings; the "cost-optimal level" should include the cost of greenhouse gas allowances through the chain of the building; the "renovation passport" should define the improvement measures on energy efficiency and decarbonise buildings, including potential circular measures; "deep renovations' should be defined as buildings that reach a high level of energy efficiency (class A) or reduce 60% of their primary energy demand; "staged deep renovations" should have a maximum of 3-4 steps to renovate collective residential buildings. Include definitions of embodied emissions, circularity, sufficiency and one-step deep renovations

[3] European Commision. Level(s)

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Article 3 NBRP	Adjusting the timeline of NBRPs with the implementation of the Renovation Wave Setting targets for the implementation of circular measures and minimum requirements for the use of secondary materials in both new buildings and renovations by 2025, 2030 and 2040, including design for dismantling and reversibility of buildings and sufficiency Including embodied and operational GHG emissions thresholds in the definition of NZEB Establishing requirements for phasing out fossil fuels from H&C systems and introducing renewables energy-based buildings systems Revising NBRPs under the EU WLC roadmap and the NECPs Include indicators that ensure that article 22 of the EED recast is fulfilled
Article 7 New Buildings	Include the timeline for assessing WLC and establishing thresholds and minimum requirements by 2025[4], to be implemented by 2028 at the latest. Regardless of their useful floor area, all new buildings should report life-cycle GWP. Set targets for minimum circular requirements on new buildings. Promote sufficiency measures in new buildings such as shared appliances and spaces
Article 9 MEPS	Establish energy-use caps to accompany MEPS implementation to ensure that the renewable energy system can cover the demand sustainably and cleanly. MEPS will be reached through deep renovations, achieving the highest possible energy efficiency level by planning a maximum of two or three steps. Several technical and economic strategies should be put in place to ensure that households are not locked into a poverty loop
Article 10 BRP	Include a WLC approach and measures to reduce GHG emissions in both operational and non-operational stages. Define potential measures on circularity for renovations to achieve minimum circular requirements, mainly on the use of reused and recycled materials.
Article 15 Financial incentives	Add financial incentives or measures to boost/implement circularity in order to overcome current market barriers. Add financial incentives or measures to support the behaviour change that could reduce energy consumption Add financial measures to avoid renoviction linked to the renovation processes. Renovations that can demonstrate a reduction of CO2 over the life cycle of the building should have a higher priority for financial incentives. No fossil fuel systems should be financed with public money from today onward, and they should be banned from the market as soon as possible.

[4] BPIE. Roadmap to Climate-Proof Buildings and Construction. How to Embed Whole-Life Carbon in the EPBD.

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	Incentives for deep renovations should include a reduction of the current 60% primary demand or achieving a class-A on energy efficiency and a detailed project to be implemented in 2-3 steps for collective residential buildings.
Article 16 EPC	Include a mandatory requirement to report on the WLC of buildings Include recommendations to reduce the total GHG emissions of the building through circularity measures
Article 19 Data Base	Include data on secondary materials and other circular measures mobilised in both new buildings and renovations
Annex I	Include additional numeric indicators of greenhouse gas embodied emissions (production and/or construction of buildings) in the aspects to consider to assess the energy performance of buildings and the obligation to provide information on embodied emissions related to the use of construction products and materials. Expand the circular approach beyond secondary materials, including other aspects such as design for dismantling and reversibility of the buildings
Annex II	See the aforementioned comments made on NBRP (article 3)
Annex III	**ZEB definition:** should be revised as presented in the Definition chapter below. **WLC benchmarks:** Annex III should include guiding principles for carbon accounting and management, guidance to harmonise the measurement of WLC across the EU and WLC benchmarks and limits for each building typology and different climatic zones. Include WLC metrics to define potential thresholds on WLC within a harmonised framework across the EU. This should be based on the Level(s) framework and EN 15978 to reduce divergence on WLC measurement across the EU. Detailed requirements should be included, mainly on the scope of the assessment, background data and reference study period. Ensuring high quality and comparable data is essential to establishing WLC benchmarks and limits across the EU. Remove the use of national methods. Recent IEC EBC Annex 72 research on Comparison of the greenhouse gas emissions of a high-rise residential building assessed with different national LCA approaches shows that results vary by country. Annex III should also include data regarding embodied emissions on construction products to ensure a proper WLC assessment from the CPR revision.
Annex V EPCs	EPCs should report on both embodied and operational CO2 emissions. Suppose there is no available data at the national level; in that case, the MS can use data from other European countries to establish approximate calculations to be corrected over time. Include circular requirements to be met, which will be defined in a new dedicated article on strategies for reducing Whole Life Carbon Add the measurement of impacts per occupant/user (utility) to look at building impacts. Propose strategies and indicators to reduce energy consumption per capita.

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Dedicated article for strategies to decarbonise the EU building stock

A dedicated article on strategies for reducing Whole Life Carbon, measured according to the requirement from Article 7 and Annex III, should also be included, compiling the following points:

Sufficiency, reducing the need for generating new embodied emissions

Sufficiency measures should be part of this new article, supporting the reduction of the need for consumption of materials and appliances such as prioritising renovations rather than new buildings, reusing and redesigning empty buildings, increasing space and equipment sharing in buildings to reduce the number of unused buildings, stabilising the average size of new dwellings per inhabitant, promoting multi-family houses instead of detached houses and implementing measures that stabilise the average m2 per inhabitant of households across the EU.

Circularity, boosting resource efficiency to reduce embodied emissions

Circularity measures should be part of the EPBD, supporting the reuse and recycling of materials and the reduction of waste generated by the construction process. Circularity is a cross-cutting approach that impacts the whole lifecycle of the buildings with potential actions such as designing for dismantling and reversible buildings, promoting the use of reused and recycled materials and the cycling of materials from the dismantling process in renovations enhanced through pre-demolition audits. For that purpose, setting targets for the use of secondary materials and establishing minimum circular requirements in new buildings and renovations should be included in this article.

Secondary materials: the EPBD should establish **requirements for the Member States to set specific national targets for 2030 of at least 15%[5] for the use of circular materials in buildings by 2025 based upon current average levels in the construction sector. The EU recommendation should be delivered by 2024 at the latest, and be founded upon commitments to double the circular material use rate by 2030 under the Circular Economy Action Plan [6].**

Low carbon and natural-based materials

Low carbon and natural-based materials should be supported in renovations and new buildings through the EPBD. Low carbon and natural-based materials have no priority in the market since the current requirements are thought for raw materials, and there are no minimum environmental requirements established yet in the current Construction Product Regulation. The EPBD could set minimum use of low carbon and natural-based materials, such as wood, in new buildings and renovations, avoiding the use of the most polluters such as cement, virgin steel and concrete.

Phase-out fossil fuels: Heating and Cooling systems

Decarbonising Heating and Cooling systems is crucial to ensure the decarbonisation of the building stock, and the EPBD should pave the way for the phase-out of fossil foils used in H&C systems. **Article 09**, Financial incentives and market barriers, includes that fossil fuels cannot be funded by January 01 of 2027, which is too late to achieve the reduction of 55% emissions by 2030. The EEB advocates not

[5] 1) Eurostart.2020 Circular material use rate by material type.
2) European Environment Agency. The European environment — state and outlook 2020.
[6] European Commision - Circular Economy Action Plan

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financing fossil fuel systems with public money or being part of the Renovation Wave. MEPS and deep renovations should by default prohibit fossil fuel systems. Those **should be banned from the market for new constructions and renovations by 2025** as recommended by IEA[7]. Furthermore, the JRC report, EU Challenges of Reducing Fossil fuel Use in Buildings,[8] claims that fossil fuel systems should be phased out from the market by 2024 if the EU wants to achieve the environmental objective of reducing 55% emissions by 2030. A wide replacement of fossil fuel heating systems for heat pumps[9] should be the strategy to achieve this target, and the EPBD should define a mandatory replacement rate for heating and cooling systems for the Member States.

Definitions

Zero Emissions Buildings, thinking of a real blueprint for a descarbonised building stock

The current definition framework to define a decarbonised built environment in **article 2** does not include the embodied emissions, focusing solely on energy use in the operational phase.

From Zero Emission Buildings to Zero Operational Emissions Buildings (ZOEB)

Article 2, of the EPBD proposal includes the definition of Zero Emissions Buildings, which only considers the energy consumption and energy emissions of the building in the operational phase. Although this definition is on the right track, as it stands, it does not include embodied emissions and therefore sends the message that the emissions of buildings can stay blind to the carbon impact of construction materials. Therefore, the current proposal is to be changed to be more precise and be named Zero Operational Emissions Buildings, maintaining the current table defined in Annex III. In order to achieve an effectively Zero Operational Emissions Buildings, the following changes should be included in the definition: the validation of performance and support for voluntary behaviour change, ensuring decarbonised district heating & cooling systems in coordination with the EED (recast) Article 24 (1) and the use of renewables generated off-site could be considered when the supply of renewable energy meets the criteria under Article 4 on Rules for counting electricity taken from the grid as fully renewable using requirements for a direct line or connection to be present, combined with the additionality principle[10].

Low Lifecycle Emissions Buildings (LLEB): including embodied emissions in the framework (new definition)

A low lifecycle emissions building (LLEB) is a new or renovated building that has reached a low level of total GHG emissions, including embodied emissions. On top of national thresholds, European thresholds for this low level of residual emissions should be defined as it was defined for energy efficiency in Annex III. These thresholds should be based on the European climate targets for achieving long-term climate neutrality and the goal of minimising depletion of the carbon budget. Low lifecycle emissions buildings should be promoted by carbon-efficient new constructions and deep renovations,

[7] IEA. Net Zero by 2050. A Roadmap for the Global Energy Sector.

[8] JRC. EU Challenges of Reducing Fossil fuel Use in Buildings

[9] CoolProducts. Heat pumps perform successfully across Europe – New consumer analysis.

[10] Michael Gillenwater, *What is Additionality? Part 1: A long standing problem* https://ghginstitute.org/wp-content/uploads/2015/04/AdditionalityPaper_Part-1ver3FINAL.pdf

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ensuring the use of very-low carbon and secondary materials, among other strategies. Member States may set individual limit values which can not exceed the maximum WLC determined at the EU level..

Zero Emissions Buildings(ZEB): compensating the residual embodied emissions producing renewable energy to the grid (new definition)*

A **Zero Emissions Building (ZEB) is a building that is Zero Operational Emissions Building, a Low Lifecycle Emissions Building and also could generate an excess of energy compared to what they will use during their use stage operations**. This excessive energy substitutes energy that does not need to be produced thus saving on related emissions and compensating the embodied (grey) emissions linked to the manufacturing and handling of used materials. Therefore, ZEBs are positive energy buildings that contribute more energy to the grid. The following image sum up the condition to be considered a Zero Emissions Building:

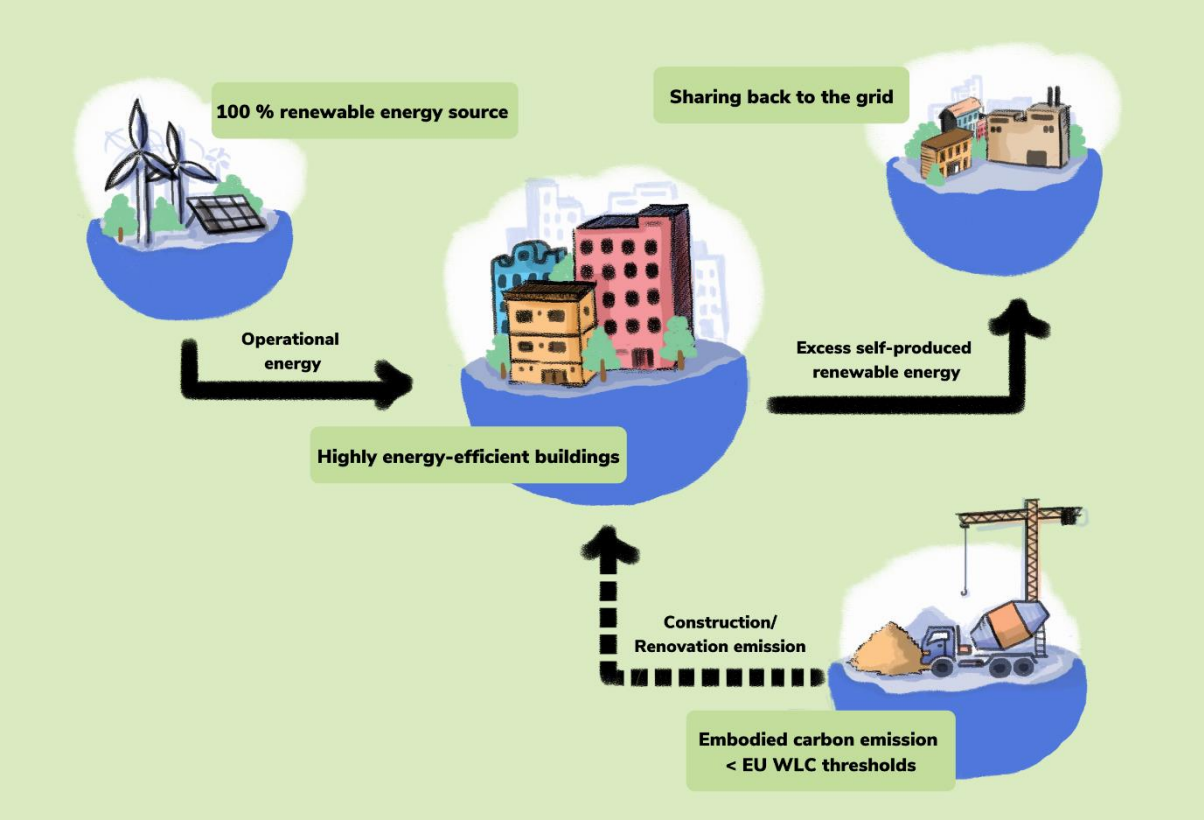

Figure 1: Conditions that determine a "Zero Emission Building"

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