

LIFE-CYCLE AND ECONOMIC IN BUILDINGS

Life-cycle of the building refers to the view of a building over the course of its entire life. Due to the percentage of emissions produced by the construction sector in Europe, it is highly important that the life cycle of buildings is constantly monitored.

The life-cycle of a building has 4 main stages: production stage, construction stage, use stage and end of life stage. In order to reduce the environmental impact of a building, it is important to understand the environmental impact of the different stages of the life-cycle.



Source: <https://pixabay.com/pl/photos/krakow-blok-osiedle-blokowisko-4981894/>

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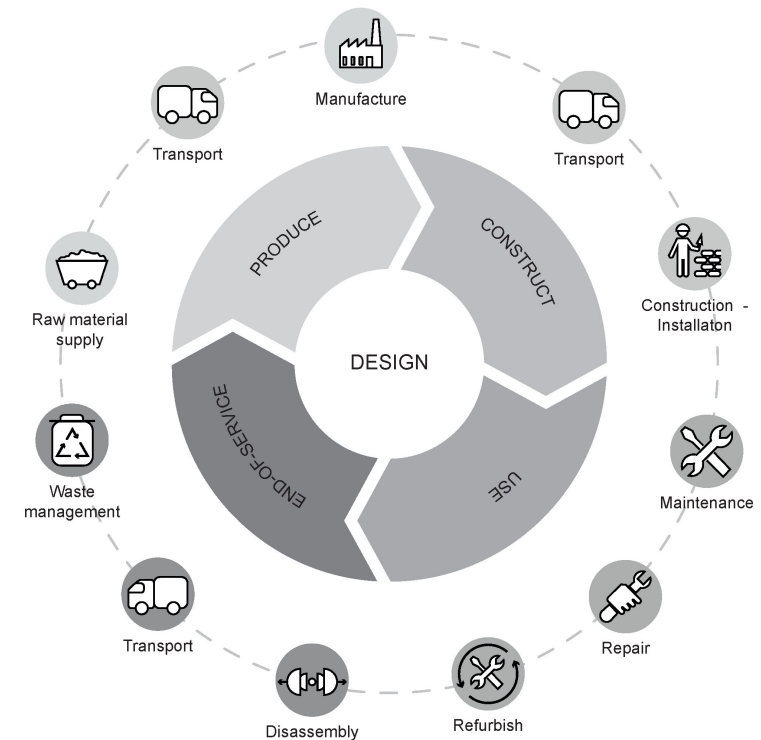
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FOUR STAGES OF THE BUILDING LIFE-CYCLE

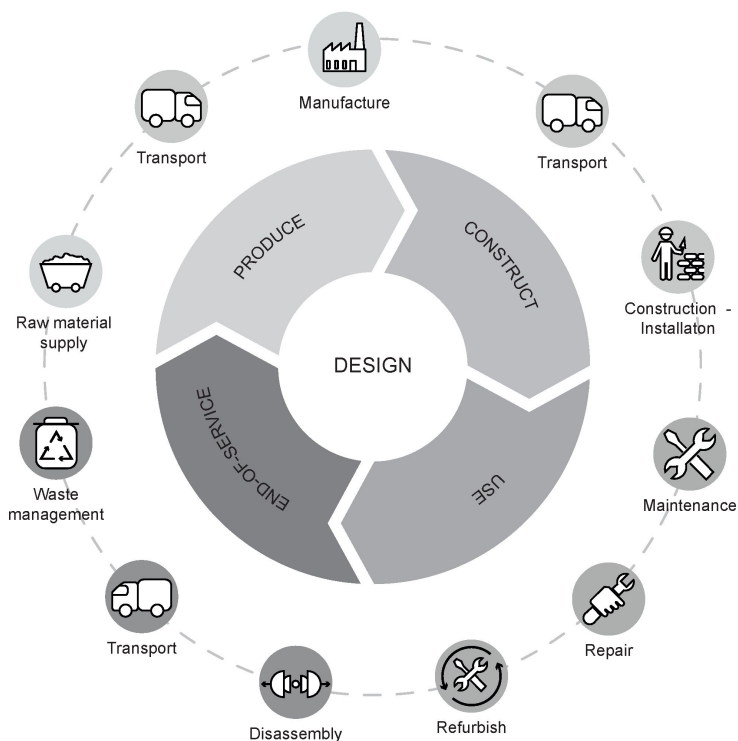
1. PRODUCTION: This stage involves the extraction, processing, and manufacturing of raw materials into building components such as concrete, steel, glass, etc. The extraction of natural resources has a great impact on the availability of non-renewable resource and might lead to their depletion. Besides, a large amount of water and energy are related to this process.

2. CONSTRUCTION: During this phase, the building components are assembled and constructed into the final structure according to the architectural and engineering plans. The construction stage of a building requires a considerable amount of energy and materials



Source: <https://ocw.tudelft.nl/course-readings/3-1-2-life-cycle-of-a-building/>

FOUR STAGES OF THE BUILDING LIFE-CYCLE



3. USE: Once construction is complete, the building enters the use stage where it serves its intended purpose. This stage can span many years or even decades, during which the building is occupied and maintained. This stage includes activities such as maintenance, and it is characterized by circular strategies such as reuse, repair and refurbish to extend the life span of the building.

4. END-OF-LIFE: In the context of a circular economy, this would mean that buildings can be safely decomposed into different components so that they can be reused, repaired, remanufactured or recycled. Since we live in a linear economy, the end of the life cycle of buildings is the process of demolition. Demolition results in a huge amount of bulk waste, which can be reused, recycled or simply landfilled. The environmental impact of this stage is related to greenhouse gas emissions from machinery and transportation, as well as emissions associated with waste disposal.

POLICIES AIMING TO DECARBONIZE THE CONSTRUCTION SECTOR

Frontrunning governments are already developing innovative policies to accelerate decarbonisation throughout the building's lifetime. The EU's policy proposals, illustrate policymakers' awareness of circularity and whole-life carbon (WLC) emission, and indicate a broadening of the scope from the operational emissions occurring during the use-phase of a building, towards emission during its entire life cycle.

POLICIES AIMING TO DECARBONIZE THE CONSTRUCTION SECTOR

THE EPBD RECAST: The EPBD recast (published in December 2021) includes requirements for EU Member States to measure whole-life carbon emission for new construction projects in line with the Level(s) Framework starting in 2027. The recast proposal also includes a draft guideline for calculation of Global Warming Potential and should be mentioned on energy performance certificates (EPCs). The EPBD recast is a part of the Fit for 55 legislative package which aims to reduce the EU carbon emissions by 55% in 2030.



<https://europanel.org/european-policy-developments/renovation-wave-strategy/energy-performance-of-buildings-directive-epbd/>

POLICIES AIMING TO DECARBONIZE THE CONSTRUCTION SECTOR

THE RENOVATION WAVE: The policy aims to drastically improve the energy performance of the existing building stock to achieve the 2030 GHG-reduction target in the building sector through a wide range of policies and measures including an increase of the renovation rate to at least 2%. One of the key actions part of the Renovation Wave includes the development of a 2050 whole-life carbon performance roadmap, and this will be achieved through, among other things, more resource efficiency and promotion of green infrastructure and bio-based materials.

3 FOCUS AREAS



Energy poverty



Renovation of public
buildings



Heating and cooling

POLICIES AIMING TO DECARBONIZE THE CONSTRUCTION SECTOR

THE CIRCULAR ECONOMY ACTION PLAN (CEAP): The plan is one of the pillars of the EU Green Deal and includes measures to stimulate the circular economy, covering the complete life-cycle of products. CEAP aims to improve circularity of construction products specifically through the Construction Product Regulation, integration of the Level(s) framework into public procurement and set material recovery targets for EU demolition and construction waste.

Level(s) - European framework for sustainable buildings is an assessment system and reporting platform to help create environmentally sustainable building solutions. It promotes whole-building lifecycle thinking and supports improvements from design to end-of-cycle for both residential and office buildings.
To learn more have a look [here](#)!