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COMPETENCES IN DETAIL

SUSTAINABLE CONSTRUCTION

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The working group Sustainable Construction of the Fraunhofer IBP, Department Life Cycle Engineering, is engaged with the implementation of sustainability within the construction sector. Therefore instruments and methods to assess sustainability of construction products, components and buildings as well as related industrial processes are developed to address the environmental, economic and social dimension of sustainability from a life cycle perspective.

Sustainability in building and construction

To meet the future challenges especially with regard to climate change and an efficient handling of resources, the construction sector is increasingly challenged to achieve a positive change through innovative ideas or concepts. In particular, any effect of a building has to be assessed over the whole life cycle and negative effects, which are caused by any construction activity, have to be minimized. Challenges which investors or planners are faced with in this context are the reduction of both environmental impacts and life cycle costs. At the same time, building characteristics which promote health and comfort for the user have to be improved.

Sustainability of buildings

Sustainability Assessment of buildings and constructions is one of the core fields of the working group Sustainable Construction. In particular, the group deals with the scientific monitoring of sustainability certification, the development of assessment procedures and rules as well as the development of methods and instruments for the practical implementation of sustainability. In Germany, an increasing number

of construction projects are labeled with the certificate of the German Sustainable Building Council (DGNB). The certificate contains numerous environmental, economic and social criteria for the sustainability assessment of buildings. The working group actively takes care for the further development of this certification system. Moreover, in the future, it will not only be essential to optimize single buildings environmentally, economically and socially, but also to shape entire city districts in a sustainable way. Hence, the group Sustainable Construction also develops respective assessment methods.

Sustainability of construction systems and industrial processes

Buildings comprise of a variety of technical systems, including e.g. building services, external thermal insulation composite systems or energy systems. As not all criteria of a sustainability assessment on building level can be adapted readily to the level of building sub-systems, specially tailored catalogues of criteria need to be developed. They also consider industrial production and installation processes, where applicable. On the basis of such adapted criteria, suppliers of those technical systems can be provided with instruments by which their products can be designed in a more sustainable way. Hence, they can contribute to the sustainability performance of the overall building.

Sustainability of construction products

Both buildings and building systems consist of single construction products. The environmental performance of those products can be depicted in detail by environmental product declarations (EPD) according to ISO 14025 and EN 15804. Along with technical data and product-specific test results such as indoor VOC-emissions, the Life Cycle Assessment (LCA) is a major element of the declaration. Thus, a transparent basis for planning and for decisions on the use of individual products can be provided to both architects and planners. At the same time, construction products affect the sustainability performance of systems and buildings to a substantial degree. The Fraunhofer IBP investigates those links in cooperation with partners from practice to be able to give more detailed statements about the importance of construction products in the context of sustainability in future.

LCA in the construction industry

To understand and analyze all environmental impacts that are caused by construction products, construction systems and buildings, the working group Sustainable Construction relies on LCA. By means of an LCA, environmental impacts such as greenhouse gas emissions, acidification of soils, air and water, ozone formation and the consumption of resources can be understood and assessed systematically along the entire life cycle. Furthermore, environmental weak points of buildings can be identified to initiate targeted optimization measures in an early phase of planning.

OUR COMPETENCES

- Life Cycle Assessment (LCA) in building and construction
- Life Cycle Costing (LCC) in building and construction
- Building Certification
- Sustainability Assessment of buildings and construction products
- Sustainability Strategies
- Environmental Product Declarations (EPD)