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PRESS RELEASE

Climate-friendly investments

Software combines Life Cycle Assessment and Economics for buildings

The European Union wants the Life Cycle Assessment of buildings to be given more significance in the future, and the EU Taxonomy creates a systematic basis for this: It defines criteria for evaluating investments, including for the climate change mitigation objective of the taxonomy. Researchers from the Fraunhofer Institute for Building Physics IBP worked together with a business partner to develop a software suite that combines ecological indicators and economic calculations for investments. This has an influence on banks' lending decisions since interest surcharges are possible for non-green investments in the future.

Environmental protection and sustainability are becoming increasingly important for home builders and buyers. With the EU Taxonomy, which has been in effect since July 2020, the European Union has created a classification procedure for assessing investments. This puts pressure on the real estate and banking sectors to place even more emphasis on Life Cycle Assessment when constructing and renovating buildings as well as on the consequences this has for the market value of properties. To do this, however, the ecological and economic indicators must be linked. Although there are recognized methods for systematic assessment in both areas, these assessment models have so far operated separately from one another, and there has been no systematic, consolidated overview.

Researchers at Fraunhofer IBP and a team of experts from the software and consulting company msg GillardonBSM AG now want to change this. Together, the two partners have developed a software suite that combines a differentiated Life Cycle Assessment and overall economic evaluation for buildings in one comprehensive evaluation model. Large project development companies and property developers, as well as credit institutions that use real estate as collateral when granting loans, now have an effective planning tool at their disposal — one that includes a risk assessment of the property with a display of the relevant ecological and economic indicators in a single coherent tool suite. This is as an objective basis that banks can use when granting loans.

GENERIS® software creates Life Cycle Assessment

The first step is to use Fraunhofer IBP's GENERIS® software tool, which enables the life cycle-oriented planning, mapping and assessment of buildings. This is where the Fraunhofer experts' decades of experience in the field of sustainability, especially in environmentally friendly construction, come into play, including, for example, precise

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knowledge of all building materials used. Robert Ilg, responsible for business unit development at Fraunhofer IBP and an expert in Life Cycle Assessment, explains: "With GENERIS®, we can create a detailed Life Cycle Assessment for different types of buildings. The key indicators for all relevant components, such as building materials, facade materials, insulation and thermal control materials or the planned heating system are included in the assessment for the entire life cycle of the building." The Life Cycle Assessment that is created is based on DIN standards DIN EN ISO 14040 and DIN EN ISO 14044.

For this purpose, the IBP experts draw on large databases of building materials. Using their software, they can model a building from an extensive catalog of standard constructions, enter pre-calculated operating parameters and subsequently evaluate the construction project. On this basis, it is possible to simultaneously create individual constructions including layer structures and to insert them into the upcoming construction project. There are also pre-filled building profiles for particularly common house types, to which only specific changes — for example the energy standard or the construction design — need to be made.

Using GENERIS®, an architect or construction company can determine the environmental effects of individual building materials early on in the planning phase and optimize the selection of the building materials to be used accordingly. The tool shows factors such as climate change potential, and a variety of other environmental impacts, in quantitative form. The entire life cycle is taken into account — from the extraction of resources in nature, through the production and use phases, right up to disposal or recycling.

Risk evaluation for project developers and credit institutions

Once the Life Cycle Assessment has been prepared, the data are transferred via interface to the jointly developed software module where the project partner's economic indicators are integrated. This module completes the environmental assessment with the business analysis. "We create a scenario-based risk module that allows risks such as construction costs, rental income and property value performance to be assessed. Long-term aspects such as potential rental income, maintenance measures that will be required in the future and market dynamics are also taken into account," explains Prof. Dr. Konrad Wimmer, executive partner at msg GillardonBSM AG. Once the profile of the respective construction project or building has been recorded along with the relevant ecological and economic indicators, the bank or financial institution can check the profile and make a loan offer accordingly.

"The practical advantage of our joint solution for customers is that it significantly speeds up the calculation of all the data needed for financial planning and lending," says Wimmer. Prospective buyers can check sustainability and future costs on the basis of reliable figures and data from a single source and use them directly. Project developers and credit institutions have the opportunity to calculate environmental aspects and profitability at an early stage. "This combination also increases the chance of transpar-

ently mapping information for sustainable investments, as the CO_2 prices of investments, which are likely to rise sharply in the future, are also mapped transparently," Ilg is pleased to report.

The software suite from the Fraunhofer IBP and msg GillardonBSM partnership is available as a prototype. The next step is to prepare the licensing for the market.

More information: Generis Solution

EU taxonomy

This classification procedure evaluates the sustainability of investments and projects. Under the Green Deal, the goal is to support the achievement of climate targets by 2030.
The classification provides definitions and criteria that companies can use to assess and label the sustainability of their activities, such as construction projects. This is expected to create security and transparency for buyers and investors, and put an end to greenwashing.

In total, the EU taxonomy covers six topics. Of these, the topics of climate change mitigation and climate change adaptation have already been defined.

The other areas will be completed by 2023:
- The sustainable use and protection of water and marine resources
- The transition to a circular economy
- Pollution prevention and control
- The protection and restoration of biodiversity and ecosystems

EU Taxonomy

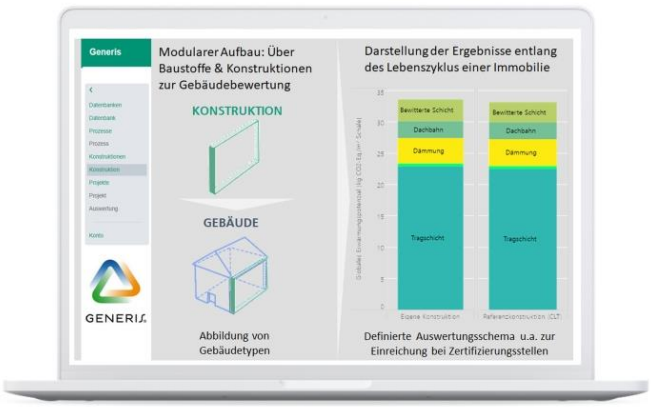

Fig. 1 The GENERIS® software makes it possible to model a building from an extensive catalog of standard constructions, to enter precalculated operating parameters and to subsequently assess the construction project.

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