Reason / starting point

The EU Building Directive obliges the public sector to build buildings only to the lowest energy standard from 2019. The State of Berlin also strives to keep construction waste as low as possible. This raises the question of how buildings whose service life has been optimized for energy efficiency also leave an environmentally compatible footprint in the material cycle.

Subject of the research project

The purpose and objective of the "Leiffaden zur Vermeidung nicht recyclingfähiger Bauabfällen bei künftigen kommunalen Hochbauvorhaben" (Urban Mining) is to support the selection of building materials and constructions already in the planning phase in order to increase the proportion of recyclable materials in future dismantling projects.

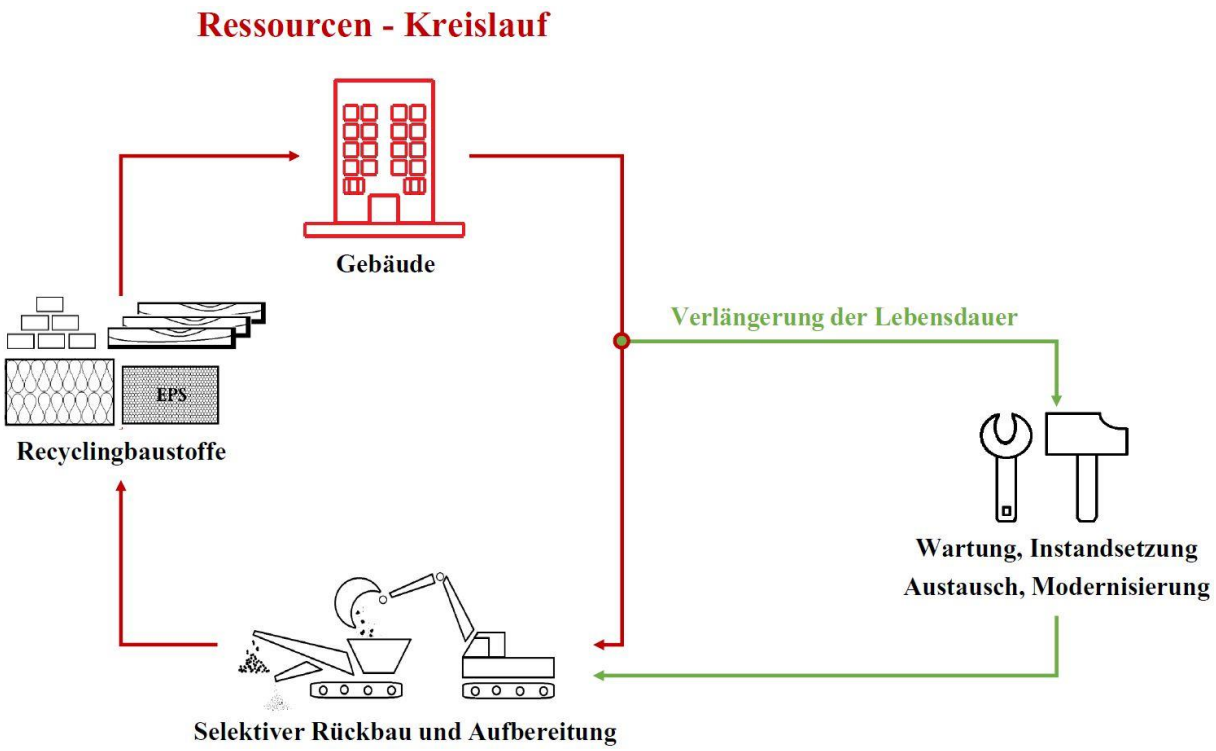

Figure 1: Urban mining - ideal material cycle

The research project, which was carried out in cooperation with the Senate Department for the Environment, Transport and Climate Protection, is addressed to the construction administration of the State of Berlin. However, the guide can also serve as a model for other public and private builders.

As a rule, buildings have a very long service life, so that it is difficult today to predict what will be the state of the art in the recycling of building materials the day after tomorrow. In addition, there are many - sometimes competing - demands on buildings from an economic, ecological, socio-cultural and technical point of view. An evaluation of these properties is carried out in the Sustainable Assessment System BNB of the Federal Institute for Research on Building, Urban Affairs and Spatial

Development (BBSR), which is to be bindingly introduced for public building projects in the State of Berlin.

This report presents a draft indicator for the quantitative assessment of recycling efficiency, which should be integrated into the sustainable construction assessment system in the medium term.

Recycling efficiency is based on the classical approach of the ratio of benefits to costs. However, the traditional mass-related approach is extended to include a volume-related approach, as products of high bulk density, such as reinforced concrete, as well as products of low bulk density, such as insulating materials, are used in the construction industry. A purely mass-based approach would underrepresent the latter products in determining recycling efficiency. This would not be expedient, especially against the background of even stricter requirements for structural heat insulation and thus increasing insulation material volumes in the future.

The benefits of recycling efficiency are derived from the quality of the recycled material - e.g. unmixed material - and the availability of technology. Established recycling channels receive the highest level of technology availability. The quality of the recycling product is based on the hierarchy of the Closed Substance Cycle and Waste Management Act from reuse as the highest level to landfilling as the lowest level. Due to the long service life of buildings, materials should also be "rewarded" for which pilot applications / pilot plants are initially available according to the current state of the art, or for which the recycling approach is even in the laboratory stage.

The expenditure is a product of the dismantling expenditure, the transport expenditure and the preparation expenditure.

Summery

The first approach for the input parameters given in this research report is by no means to be regarded as final, but is rather intended to explain the methodology for determining recycling efficiency. The input parameters should be determined by consensus of the stakeholders involved and the evaluation should be subject to a pilot application.

Until then, chapters three and four of this guide provide a qualifying assessment of different building materials and constructions without claiming to be complete.