

BUILDINGS AS A MATERIAL RESOURCE

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Buildings, together with network infrastructure, represent the main stock of materials within an urban system. Analyzing the potential of the building stock of the city of Vienna as a source for future secondary raw materials is the aim of the work presented.

Combining data about the material composition of different building types with information about the building structure allows assessing the material stock on a building level and for the whole city. Data about the material composition of buildings has been generated by applying a bottom-up approach to different case studies (single buildings) as well as through literature review. The aim was to generate specific material intensities for different building types (period of construction/ utilization). The database for the specific material intensities is continuously enhanced in an ongoing research project by analyzing further buildings. In order to characterize the building structure, GIS data (Geographical Information System) about all buildings in the city of Vienna have been collected from different municipal departments. As a result a data set providing information about volume, period of construction and utilization is available on a building level. Based on the period of construction and the utilization of the building specific material intensities are assigned (kg/m^3 gross volume) and thereby provide information about the embedded materials.

Results of the study indicate that the dominant share of the stock consists of mineral materials (concrete, bricks, etc.). Metals or plastics only hold a very small share of the overall building material, however, the total amount of valuable materials is quite high. Combining the generated data about the embedded materials with information about demolition activities allows predicting future amounts of demolition waste and thus materials potentially available for recycling. Therefore, knowledge about the material stock of buildings in Vienna is an important step towards closing material cycles in demolition waste management. The applied GIS system is an appropriate tool to characterize the building structure of a city and can serve as dynamic data repository for specific material values of buildings. Furthermore, remote sensing and topographic mapping, offer techniques to monitor changes in the building stock.