joint research project

"IMPRO BUILDING"

Environmental Improvement Potentials of
Residential Buildings

ABSTRACT

The overall goal of the project 'Environmental Improvement Potentials of Residential Buildings (IMPRO-Building)' is to quantify and compare the environmental impacts of the main typical and relevant residential buildings in the EU-25. Based on this, improvement potentials from a life cycle perspective are identified and assessed environmentally and economically.

The scope of the study involves the environmental impacts of the relevant building types used as household dwellings: single family houses (including two-family houses and terrace houses), multi-family houses and high rise buildings, from existing and new dwellings in the EU-25. Environmental impacts are analysed both for building structure and building occupancy. Nevertheless, only improvement options related to building structure and design changes are considered, as the ones associated with occupancy are already analysed in other parallel EU-projects. In all cases the same system boundaries are applied, including all life cycle stages: production and transport of building materials, refurbishment, heating and cooling and waste management (demolition and refurbishment). As background data European average data is used and the maximum service life of a building is limited to 40 years.

Based on existing literature as well as expert judgement, a total of 72 residential building types are identified and categorized according to zones (Northern, Middle and Southern Europe), according to size (single, multi-family houses and high rise buildings) and according to age (old and new buildings). Together they represent 80% of the entire building stock in the EU-25.

These building types are then modelled by means of using the epiqr database and the LCA software GaBi 4 and the 'generic building model', which is applied to all building types considered. Once modelled, the environmental impact assessment was performed. A total of five impact categories were analysed: Acidification Potential (AP), Eutrophication Potential (EP), Global Warming Potential (GWP), Ozone Layer Depletion Potential (ODP) and Photochemical Ozone Creation Potential (POCP) plus the environmental indicators Primary Energy from renewable sources and Primary Energy from non-renewable resources.

Contact details of responsible person CalCon Group:

Mr. Dipl.-Phys., Dipl.-Kfm. Christian Wetzel

Tel. +49(0) 89 - 55 26 98 - 22
c.wetzel@calcon.de