

## EMISSION REDUCTION FOR THE BUILDING SECTOR

### WHAT'S THE PROBLEM?

The building sector accounts for 30 to 50% of the CO<sub>2</sub> emission. In Europe the CO<sub>2</sub> emission of buildings is 23% for heating, 36% when electricity use is included, and 4% for the building process. In the total worldwide CO<sub>2</sub> emission, only the buildings have a part of 40%.

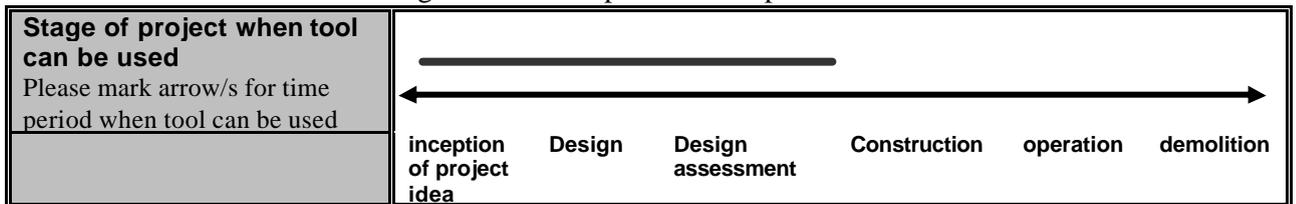
The cement production energy and chemical process for example causes for at least 5% of the worldwide CO<sub>2</sub> emission. Besides construction of buildings this cement is also used for infrastructures such as roads and bridges.

Building heating and cooling requests a low temperature energy. This is a low value energy which can be easily produced with renewable energy sources such as solar energy. Other sectors use mainly high value energy such as kinetic or electric energy. This needs much more expensive renewable energy processes.

Zero-emission buildings cause a substantial reduction in the total CO<sub>2</sub> emission figure, thereby creating room for CO<sub>2</sub> emission growth in market sectors with more expensive reduction options such as high temperature or electric processes for chemistry or transport for example.

### TIME AND SPACE SCALES' CHARACTERISTICS?

The time scale concerns a building innovation implementation period.



The space scale is at building level.

Scale of project that can be investigated using the tool	Component	Building	Neighbourhood	City	Region
		X			

### CONFLICTING AREAS

Building cooling is an increasing demand in developed and developing countries, increasing electricity and power plant top capacities.

### CASE STUDIES LINK TO THIS ISSUE

The Emporium case study for example can be linked to this issue.

### WHAT COULD BE ENHANCED TO IMPROVE SUSTAINABILITY?

Within the 25 Gton CO<sub>2</sub> emission in 2000, indoor climate accounts for 5.7 Gton CO<sub>2</sub> or 30 kg of CO<sub>2</sub>/m<sup>2</sup> for the existing 186 billion m<sup>2</sup> of floor area.

Within the 10 Gton CO<sub>2</sub> worldwide admission capacity, the building sector emission will have to be reduced to 2.3 Gton CO<sub>2</sub> by 2050 and, if the floor area grows to 582 billion m<sup>2</sup>, to 4 kg CO<sub>2</sub>/m<sup>2</sup>.

**How?**

By using fossil energy, the exergetic efficiency of a central heating system is only 3%. The heating of the indoor climate, from 0°C outside to 20°C inside, requires very low-value energy that can be supplied by low temperature systems. Low temperature systems lend themselves well to be connected to solar energy heat generators