temperatures during daytime by evapotranspiration and higher surface temperatures during nighttime because of the stronger heat flux from the underlying vegetation layer. Therefore, the overall effect on the cooling load is relatively small (Table 2).

5 Summary and Discussion

The different results of the laboratory experiment and the simulated reference room are probably caused by differences in the size of the window and the room itself due to the used grid resolution.

The room location and solar radiation cause the strongest effects in the simulations for the heating and cooling load. The ventilation of the room can have a strong impact on the heating and cooling load if there is a large differenze between indoor and outdoor temperature. In other meteorological szenarios ventlation could be used to lower the energy demand of the rooms. Overall the energy demand can be more than two times larger between different rooms.

The rooms in the green building need up to 16 % less energy in the summer and up to 26 % less energy in the winter scenario. This effect depends on the available soil water for evapotranspiration, the meteorological conditions and whether the green walls will lose their leaves during winter.

The simulated trees decrease the cooling load in the summer scenario by up to 34 % and increase the heating load during winter by up to 51 %. The negative effects during winter could be avoided by using deciduous trees.

The overall effects of the tree, green and window measures should be evaluated on a long-term yearly basis and effects of the micro-scale urban climate should be taken into account.

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