



## **Energetic Aspects of Green Roofs**

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### **Short description of the speaker**

Prof. Dr. Manfred Köhler is a green roof "cosmopolitan". He is working with research groups in Spain, Brasil, Mexico, Singapore and the USA. The "urban heat island effect" is a well-known problem of urban agglomerations in the tropic climates and North America.

### **Biographical details or background information**

Although green roofs are not constructed primarily to save energy, they do. The added layer of green roof construction works as additional insulation and reduces the amount of heating energy used. The captured water inside the growing media and the structure of the seasonal vegetation layer are reasons for different values during the year. The water inside the green structure is one of the main aspects of the energetic effects of green roofs. Measurements on research roofs, done at the University of Applied Sciences in Neubrandenburg, calculated some insulation values. Roughly, 10 cm or the typical extensive green roof, has an insulation effect of about 1 cm of typical technical insulation layer (e.g. Styrofoam) [7]. The insulation of several plant layers, i.e. mosses, sedum, grasses, shrubs, trees, open up and provide additional effects by reducing direct radiation damage to the building surfaces and the wind just above buildings. Green roofs, extensive and intensive, offer energetic benefits in summer as well as in winter. All enhancements from these effects must be calculated separately for each project. The number varies from between a few percentages up to 60%, a value theoretically calculated as a reduction parameter under summer conditions. Additional irrigation can be an additional benefit, not only for plant growth, but also as a type of air conditioning system. A combination with rain water systems is also recommended.