
THREE QUESTIONS FOR...

**MICHAEL BAUER: HEAT STRESS IN THE CITY –
MORE GREENERY AND HIGHER BUILDINGS GIVE HOPE OF COOLING**

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‘To improve the climate and comfort in German cities we must build higher and thus increase the proportion of green urban spaces. A higher amount of green space should be prescribed by law.’

1. Climate researchers are currently warning us that we may be facing a ‘hot age’. Life will be especially uncomfortable in metropolitan cities in view of impending heat waves and droughts. What does that mean in detail for buildings and cities?

This summer has clearly demonstrated that we are in the grip of climate change. This is particularly evident in the world of real estate. Here, action is needed in our building concepts and our urban development policies. The increasing frequency of long heat waves since the extremely hot summer of 2003 has led to the development of new approaches. For example, in large residential construction projects there is now always a discussion about the associated cooling concept. But the lack of comfort due to heat in cities and buildings is not the only problem that stems from climate change. Building owners and whole cities can be at risk when the longed-for rain finally comes. Sometimes, heavy rain transforms cities and whole regions into a raging river within minutes. Flood protection through features such as vegetation, retention flood areas or temporary rain collection ponds is therefore increasingly important in urban development projects.

2. Heat waves reduce the comfort and attractiveness of our cities. What are the causes?

Due to the shortage of residential space, German cities are tightly packed with buildings, and this traps the heat in the summer. Here, it is hardly possible for buildings to cool down at night when the outdoor temperatures are lower. The increasingly effective building insulation resulting from the German Energy Saving Ordinance (Energieeinsparungsverordnung, EnEV) also plays an important role. Good insulation is important because it reduces energy costs in winter. But at the same time, good insulation changes the behavior of buildings and thus prevents night-time cooling in the summer. Heat is retained in the building for longer, and simple cooling solutions are needed. However, here we should not resort to air-conditioning systems as a classical retrofit solution using a high amount of energy. Instead, we should use natural sources such as natural night-time ventilation. It is relatively easy to use underfloor heating as a cooling floor in the summer. As a storage-related solution, the water circulation system can cool to approx. 20 degrees Celcius at night and transport indoor heat to the outside when the outdoor temperatures are at 16 degrees. This means that the room temperature can remain pleasant for a comparatively long time. Even the ceiling can be used as a cooling surface by means of building component activation. And there are now many projects in which geothermal energy is used not only for heating, but also for cooling. Combined with sun protection, inexpensive cooling is possible for a relatively long time without using excessive amounts of energy.

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3. How can we provide long-term heat protection for buildings and cities?

Two factors should become a fixed element in future urban development planning: more vegetation and taller buildings. Intensive sun radiation, high temperatures and closely packed urban density are factors which favor the heat pocket effect, i.e. higher air temperatures close to the ground in cities. To preserve and enhance urban quality of life, we need city development concepts – referred to as ‘green city concepts’ – which take all relevant factors into account. Vegetation includes green verges, temporary rainwater ponds, green roofs or façades, and trees which give shade. Toronto is a good example here because green roofs have been prescribed since 2009 for commercial, residential and public buildings – and it would be helpful if Germany issued such regulations in line with the Energy Saving Ordinance. Vegetation on buildings can take a broad variety of forms: from a minimalist solution in which space on the balconies is used as flower trays, to green walls mounted in front of façade elements. Green building certifications already encourage green spaces on roofs in Germany. But to reduce the proportion of soil which is sealed by impervious surfaces and thus enhance the climate and provide protection against flooding, we especially need taller buildings. Many German cities such as Berlin, Frankfurt am Main and Düsseldorf are already pioneering this with their current residential construction projects. This will not only benefit the environment, it also offers economic advantages.



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More plants and higher buildings for our cities. Green façades help to preserve a comfortable atmosphere in periods of great heat.