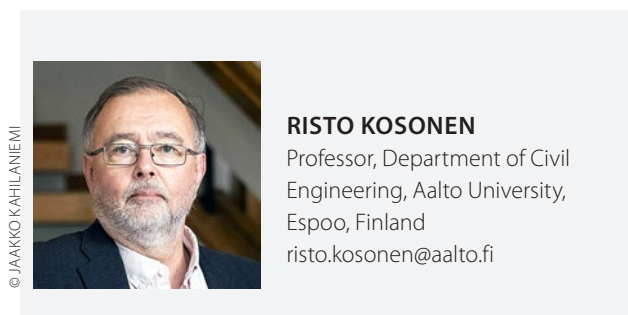


A comprehensive process is needed to manage indoor climate



RISTO KOSONEN

Professor, Department of Civil Engineering, Aalto University, Espoo, Finland
risto.kosonen@aalto.fi

The Energy Directive requires zero-emission buildings in the future. The starting point is to reduce energy consumption in accordance with the principle of energy efficiency first. At the same time, the Commission requires, in the implementation of the Energy Directive, that non-residential buildings should be equipped with measuring and control devices intended for monitoring and regulating indoor air quality.

In practice, this can be done with demand-based ventilation and its automation system. The energy consumption of ventilation can be reduced by up to 50% when ventilation is controlled according to demand. However, it has been found in several times that demand-based ventilation systems do not as it should be. In this case, the potential energy savings are not achieved, and the indoor climate conditions may not be in line with the set objectives.

Ventilation problems are not new, as complex systems require special expertise in different phases of the project. Chilled beam systems became more common in the 1990s, when it was found that regulating water is much simpler than regulating air flow rates. Equipment technology has made some progress, but the technology still faces some of the same challenges as it did 30 years ago. Product development is still needed, especially in relation to measuring air flow.

However, the biggest challenge lies in the implementation process. The solution to managing problems is continuous commissioning. It is generally understood that commission only applies to the hand-over phase. However, continuous commissioning of systems should start from the design phase and cover the entire life cycle. In some Nordic countries, Indoor climate classification has been used in design for several decades. A similar systematic process is also needed to monitor the indoor climate of existing building stock. To guarantee conditions and the system performance, at least the room air temperature, carbon dioxide and pressure difference over envelope in the critical zones must be verified. This way, most indoor air related problems can be prevented in advance and at the same time the requirements of the Energy Directive can be met.

It is also good to remember that the economic importance of the indoor climate is quite significant in terms of both users' productivity/performance and health. Deterioration in the indoor climate can cause multiple costs in relation to the energy consumption of the property. It should be considered what is worth saving and remembering that buildings are made for people. ■