

Decarbonization and digitalization of buildings – the future of HVAC

Our HVAC sector is called to play a crucial role in the main energy and environmental challenges of the European Union, and the definition and implementation of strategic actions in our domain can really lead the European transition towards a post-carbon society. The practical implementation of the pillars of low energy buildings design - reduction of building energy demand, increase of systems energy efficiency and maximization of renewable energy sources use - sets a trajectory that is completely coherent with the mission of a community living with a reduced need of carbon-based energies, down to zero.

How to keep high comfort and high indoor environmental quality levels by a new design and operational approach for buildings based on “de-carbonization”: this is our ambitious target for the next future.

To help us in this difficult path, the revised Energy Performance of Building Directive gives interesting messages to be interpreted in order to push the building performances towards a new era. There is now a clear focus on actual energy consumption and performances: we must work to reduce the so called “performance gap”, that is the difference between calculated and actual energy performance. To do so, we have to better understand the influence of occupants’ behaviour on building energy consumption, the way which occupants interact with the building to change comfort and/or consumption levels and how positive actions stimulated by an energy conscious approach may modify the building energy dynamics. If we want to increase the capability to interpret users and the “users & building” complex systems, we need data: the digitalization of the building, and specifically of the HVAC sector, is a fundamental step. Sensors are in buildings to measure quantities, to collect and elabo-



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rate data, to analyse and investigate indicators, to give information to the building manager, to give feedbacks to occupants. Data science is penetrating the building energy sector, and this is a unique opportunity to create new products and services. The development of the Smart Readiness Indicator, promoted by the new EPBD to help the interpretation of the metabolism of such complex organisms like buildings, is challenging and our HVAC community must take a leading position on this issue. Building monitoring and data analysis is useful not only to characterize the building in its individual behaviour, but also to open opportunities of interaction among buildings as parts of an energy communities. Day by day, we move our boundaries of energy investigations from single buildings to groups of connected building, where different energy vectors can be selected to feed the different energy equipment and to cover the different energy needs of the users. The transition to an all-electric, digitalized, connected and smart interacting buildings community is coming, as it is happening to the mobility sector. Be smart to take this opportunity to push new innovative solutions to our HVAC sector: the opportunity is there, we must be there too. ■