Multi-functional and adaptive building envelopes can provide step-change improvements in the energy efficiency and economic value of new and refurbished buildings, while improving the wellbeing of building occupants. They therefore represent a significant and viable contribution towards the EU 2020 targets for nearly zero energy buildings (nZEB). Innovative facade systems facilitate the reuse of these innovative concepts to design and build smart buildings that adapt to the needs of the occupants and of the environment. The SELFIE project aims to develop novel adaptive envelope systems for nZEB, facilitating the exploitation of RES at building scale and simultaneously increasing building energy efficiency and environmental performances. SELFIE concepts are foreseen to be like an adaptive system where it will be possible to integrate modular architectural configurations and energy features in order to answer in real time to climatic conditions.

Innovative façade systems research, finally, opens new scenarios for innovation of envelope systems for the future, with the goal to define a general evolution in the way to design, to build and to manage smart buildings of future generation. Project SELFIE aims, who involved a construction company owner, companies producing material and building systems, universities and national research centers, was to develop novel adaptive envelope systems for nZEB facilitating the exploitation of RES at building scale and simultaneously, to improve indoor environmental quality in non residential buildings. Adaptive envelope have showed a significant technological evolution on past decade thanks to the possibility of integrating smart materials and building management systems. Adaptive facades are able, in fact, to change their architectural configurations and energy features in order to answer in real time to climatic conditions.

These concepts are made possible by the innovative materials, which are able to change their properties based on the environmental conditions. They therefore represent a significant and viable contribution meeting the EU 2020 targets for nZEB, in the field of technological research. They foreshadow the possibility of experimentation for the future, with the goal to define a general evolution in the way to design, to build and to manage smart buildings of future generation. Project SELFIE aims, who involved a construction company owner, companies producing material and building systems, universities and national research centers, was to develop novel adaptive envelope systems for nZEB facilitating the exploitation of RES at building scale and simultaneously increasing building energy efficiency and environmental performances. SELFIE concepts are foreseen to be like an adaptive system where it will be possible to integrate modular architectural configurations and energy features in order to answer in real time to climatic conditions.

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