



**INTERNATIONAL**

## INVITED SESSION SUMMARY

**Title of Session:**

Towards Nearly Zero Energy Buildings: technologies and energy performance assessment

**Name, Title and Affiliation of Chair:**

Elisa Di Giuseppe, MSc Eng. Ph.D. - Università Politecnica delle Marche (Italy)

Alfonso Capozzoli, MSc Eng. Ph.D., Assistant professor, Politecnico di Torino (Italy)

**Details of Session (including aim and scope):**

According to the EPBD recast 2010/31/EU, a "Nearly Zero Energy Building" (nZEB) means "a building that has a very high energy performance [...] and in which the nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby". Since EPBD recast does not provide harmonized requirements and details of energy performance calculation framework, it will be up to the European Member States to define what "a very high energy performance" and "a very significant extent by energy from renewable sources" mean.

In recent years advanced insulating materials and components presenting very high thermal performance or dynamic properties (VIPs, PCMs) have been developed. Moreover some of the most important manufacturers in the field of façade technology have started to develop integrated modular solutions that show an active and dynamic behaviour, that incorporates various components and materials for environmental control and solar energy exploitation, and that can be connected with the building services network.

However, to achieve a satisfactory market penetration and an effective applications of such envelope solutions, some barriers have to be overcome and knowledge needs to be deepened. The main issues are to: find innovative solutions, optimize existing technologies, provide testing procedures and develop suitable numerical models to properly analyse and design these building envelope components. Finally, it is also necessary to identify/develop accurate numerical methods and procedures in order to appreciate and certify their energy benefits.

The European Directive also requires Member States to define their own minimum requirements for the energy performance of buildings with a view to achieve the "optimal costs levels" during the estimated life cycle of the buildings. It therefore emphasizes the need to make design choices taking into account the costs-benefits during the entire life cycle of buildings, thus directing designers, developers and enterprises to choose constructive solutions and systems "balanced", not necessarily the most energy-efficient. However, the calculation method proposed seems difficult to apply.

These and others are the elements introduced recently at the regulatory level, but which still require considerable research and investigation on their application.

This session aims to disseminate knowledge about the issues and potentials of the application of the EPBD recast in different Countries and climatic contexts and the best ways to improve the energy performance without neglecting the Indoor Air Quality (IAQ), the general building sustainability, the costs of solutions.

Original papers are invited for consideration on a range of topics related the risks and potentials of the application of EPBD recast at national level: case studies, critical review, methodologies, strategies in different climatic context, remedial actions, etc.

**Main Contributing Researchers / Research Centres (tentative, if known at this stage):****Website URL of Call for Papers (if any):**

<http://seb15.sustainedenergy.org/cms!Sdisplay.php>

**Email & Contact Details:**

[e.digiuseppe@univpm.it](mailto:e.digiuseppe@univpm.it), +39 071 2204246, Department of Construction, Civil Engineering and Architecture, Università Politecnica delle Marche, Ancona, Italy

[alfonso.capozzoli@polito.it](mailto:alfonso.capozzoli@polito.it) +390110904413, Department of Energy, Politecnico di Torino