



INTERNATIONAL

INVITED SESSION SUMMARY

Title of Session:

Sustainable, affordable and smart renovation of existing and historic buildings

Name, Title and Affiliation of Chair:

Dr. Gianluca Maracchini, Università Politecnica delle Marche (Italy)

Dr. Elisa Di Giuseppe, Università Politecnica delle Marche (Italy)

Details of Session (including aim and scope):

European buildings are responsible for approximately 40% of energy consumption and 36% of CO₂ emissions in the EU, while 84% of building heating and cooling energy demand is still generated from fossil fuels. The implementation of the European Directive on the Energy Performance of Buildings (EPBD) has strongly reduced the energy consumption of new buildings within the last 10 years. However, in Europe, new buildings increase the building stock by only around 1-1.5% every year, so **around 70% of the foreseen 2050 building stock is already built today and energy inefficient.** About 45% of the EU's buildings are built before nineties and about 30% of existing buildings are "historic" buildings (built before 1945) and are in part protected or listed, considering their historical or artistic value. They **account for more than 30% of the energy consumption of the building sector.** Consequently, **retrofitting existing and historic buildings is urgent and vital for the reduction of energy consumption and emissions across Europe.**

If Member States should define their retrofit strategies pursuing a balance of energy and economic targets (to find the "cost-optimal" solutions defined by EPBD recast), they should not neglect some others important aspects, such as the indoor thermal comfort, the historic and artistic value of the building, the sustainability of the intervention during the whole life cycle.

Nevertheless, **energy-saving solutions are not so easily implementable** as in new buildings. There are intrinsic constrains related to technical, regulative and economic barriers. As a result, the definition of optimal retrofit solutions in terms of either maximum economic and environmental performance, energy consumption minimization, architectural preservation and maximum achievable internal comfort and safety is severely far to be reached in the existing buildings. These and other elements still require considerable research and investigation.

This session aims to disseminate knowledge about these issues, with the aim of **finding the best ways to improve the energy performance of existing/historic buildings.**

Original papers are invited for consideration on a range of topics concerning building retrofitting and the several related aspects (i.e.: energy efficiency, indoor air quality, internal comfort, sustainability, costs-benefits, architectural preservation, etc...).

Main Contributing Researchers / Research Centres (tentative, if known at this stage):

Website URL of Call for Papers (if any):

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