

Session title:

High indoor environmental quality and energy efficient ventilation in renovated school buildings: winning concepts and examples

Description of the topic:

The session is focused on solutions and strategies for indoor air quality, thermal comfort and efficient ventilation systems with high level of integration in renovation projects for schools, particularly in completion to intervention for high performances building envelope and integration of renewable energy systems.

School buildings are places of major public interest, where our children are educated in life's basics, in some schools beyond that, and where they spend a relevant part of their time. Therefore, not only the educational system itself, but also the conditions of these buildings are very important signals to the public, even to the pupils themselves. Schools were mostly built between 1950ies and 1980ies. The school buildings are presently in high need of renovation.

During the session valuable contributions will presents

- recent findings from researches in the field of indoor air quality, thermal comfort particularly in relation of learning in schools;
- scientific analysis on strategies to reach nZEB performance in schools renovations;
- innovative solutions for HVAC and ventilation systems (mechanical, natural and hybrid) with high level of integration in school buildings renovation projects;
- methodologies and results from monitoring studies on indoor air and thermal comfort conditions in renovated and existing schools and educational buildings;
- real examples and case studies of renovated school buildings with applied innovative solutions for systems and envelopes.

The session is organized in the framework of the RENEW-SCHOOL project supported by the European Commission, with the aim of retrofitting a great amount of school buildings to highest nearly Zero Energy Buildings level, by promoting appropriate tools and measures, help to downsize the energy use significantly as well as create and secure comfortable conditions for the pupils and teachers. Sustainable school renovation actions base on following three focus points promoted by the project:

- Improvement of the building's envelope by coating it with insulated prefabricated timber modules including wooden frame windows, solar shading and ventilation components.
- Improvement of the indoor environment quality (IEQ) by ventilating, passive cooling and daylight upgrading the classrooms.
- Improvement of the energy generation on site by using active renewable energy sources, beside the passive gains, integrated in the school buildings.

Chairpersons:

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List of contributions:

Introduction

1.

Examples of high performing school renovations applying prefabricated wooden elements in Austria

Knotzer A. (Renew-School project coordinator)

2.

Do new and renovated schools and kindergartens secure sufficiently high indoor environmental quality?

Wargocki P., Anker Hviid C., Skupien A.

3.

IEQ Evaluation in Schools: a Consideration about the Parameters PMV may be influenced by

D'ambrosio F. R., Palella B. I., Ranesi A., Riccio G.

4.

Ventilation rates and thermal comfort assessment in a naturally ventilated classroom

Allab Y., Kindinis A., Causone F., Tatti A., Simonet S., Bayeul-Lainé A.

5.

A Methodology for On-Site Visualization of Airflow Patterns and Assessment of Draught Risk in Classrooms using Laser Light Sheet

Anker Hviid C., Petersen S.

6.

Indoor climate and energy standard of school buildings with different ventilation strategy

Mijakowski M., Narowski P.

7.

Analysis of ventilation strategies for the nearly zero energy retrofit of a day care center

Pagliano L., Armani R., Sangalli A., Causone F., Pietrobon M.