

INVITED SESSION SUMMARY

Title of Session:

Emerging risks and challenges in the decarbonization of the built environment under climate change

Name, Title and Affiliation of Chair:

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Details of Session (including aim and scope):

As the importance of environmental sustainability and energy supply increases, there has been a growing focus in recent years on reducing the energy consumption of buildings. Therefore, many national and EU policies have set higher standards for new constructions and encouraged energy retrofits of existing buildings. Notably, the recent European directive EPBD IV has set the ambitious goal of a net zero building stock by 2050. Given that most of the built environment is envisaged to undergo such retrofits, this massive decarbonization requires significant technical planning and careful implementation. However, five issues, among others, still pose a considerable challenge to designers and policymakers:

- 1) The minimum performance standards set by national building codes vary between countries and do not always reflect optimal solutions in terms of costs and environmental impact.
- 2) While some countries are implementing measures to reduce the embodied carbon of new construction, this is not the case for the retrofitting of existing buildings.
- 3) Given the multidecades lifespan of a building retrofit, future energy scenarios play a major role which is usually not accounted for.
- 4) Similarly, climate change can influence several key performances of building retrofits, including operational consumption, comfort level and reliability towards physical risks of natural hazards.
- 5) Effective and efficient public policies able to raise the retrofit rates have still to be conceived and successfully implemented.

Thus, these issues constitute a plethora of emerging risks that require newly-conceived mitigation measures. The goal of this topic is to contribute to the effective implementation of decarbonization of the existing building stock.

Review, methodological, numerical and experimental papers are invited for consideration on the following topics (but not limited to):

- **Life-Cycle Cost and Impact Analysis for Building Retrofits:** Techniques for assessing long-term cost-effectiveness and environmental impacts of retrofitting measures.
- **Embodied Carbon in Building retrofits:** Methods and metrics for assessing and minimizing the embodied carbon footprint of energy retrofitting for existing buildings.
- **Integrating Future Energy Scenarios into Retrofit Planning:** Tools and methodologies for incorporating projected energy trends and scenarios into retrofit design and decision-making.
- **Climate-Resilient Building Retrofits:** Approaches to adapt retrofits to account for changing climate conditions, natural hazards, and enhanced occupant comfort.

- **Innovative Policy Instruments for Increasing Retrofit Rates:** Design and evaluation of public policies, subsidies, and financial mechanisms to accelerate energy retrofit adoption.

Format:

see <http://seb-25.kesinternational.org/fullpapers.php>

Dates and deadlines:

see <http://seb-25.kesinternational.org/deadlines.php>

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