

Workshops at CLIMA 2019

Workshop n. 14

Towards optimized performance, design, and comfort in hybridGEOTABS buildings

Tuesday, 28 May, 16:00 - 17:30,

Meeting Room TBC

Workshop organizer

hybridGEOTABS



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 723649.

Presenters

Chair

Prof. Dr. Lieve HELSEN

KULeuven/EnergyVille

Speakers

Dr. Eline HIMPE

UGent

Dr. Ogun Berk KAZANCI

DTU

Dr. Qian WANG

Uponor/KTH

Prof. Wim BOYDENS

Boydens Engineering

Scope

HybridGEOTABS refers to the efficient integration of the combination of GEOTABS (Geothermal heat pumps in combination with Thermally Activated Building Systems (TABS)) and secondary heating and cooling systems in a building. This technology offers huge potential to meet heating and cooling needs throughout Europe in a sustainable way, while providing a very comfortable conditioning of the indoor space. In this workshop the effects of radiant heating and cooling systems on Indoor

Environmental Quality (IEQ) are discussed, as well as the design of hybridGEOTABS buildings. In the first part of the workshop, the benefits of TABS for the IEQ in buildings are highlighted. Because TABS are most easy to apply in new buildings, a newly developed solution for existing buildings (renovation) is introduced, which is a radiant heating and cooling system with high thermal mass (using Phase Change Materials).

The second part of the workshop starts from the challenge of optimally sizing both the GEOTABS and the secondary heating/cooling system in hybridGEOTABS buildings, controlled by Model Predictive Control (MPC). Starting from the state-of-the-art design processes, the ongoing R&D towards a new design procedure allowing optimal integration and sizing of hybridGEOTABS is explained. These developments will lead to a holistic and easy-to-use design procedure for feasibility studies and predesign, avoiding case-by-case simulation work.

Audience

The workshop is targeting HVAC and building designers, HVAC manufacturers, researchers, teachers and engineering students.

Expected results

Attendants will learn the advantages of radiant heating and cooling systems from an energy and comfort perspective and how these are designed in the context of the overall optimization of hybridGEOTABS systems. They will also be introduced to innovative design procedures for these systems.

Programme

10 minutes	Introduction to hybridGEOTABS project - challenges and opportunities of hybridGEOTABS buildings Dr. Eline HIMPE, UGent
	<i>Part I - Focus on hybridGEOTABS primary distribution systems</i>
15 minutes	Indoor Environmental Quality benefits of radiant systems Dr. Ongun Berk KAZANCI, DTU
10 minutes	TABS in hybridGEOTABS buildings Dr. Qian WANG, Uponor/DTU
10 minutes	PCM ceiling panels as a renovation solution in hybridGEOTABS buildings Dr. Ongun Berk KAZANCI, DTU
	<i>Part II - Design challenges of hybridGEOTABS buildings</i>
25 minutes	Innovative procedures for the optimized design of hybridGEOTABS buildings Prof. Wim BOYDENS, Boydens Engineering
20 minutes	Open discussion