

SÉMINAIRE ÉNERGIE – ENVIRONNEMENT
Conférences 2024 - 2025

**Overcoming heat source limitations
for heat pumps in the larger capacity range.**

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OST - Eastern Switzerland University of Applied Sciences

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**Uni Carl Vogt – Salle 1 (rez-de-chaussée)
66 bd Carl-Vogt, 1205 Genève**

Conférence en présentiel suivie d'un apéritif

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L'orateur

Carsten Wemhoener has graduated in Mechanical Engineering at RWTH University and works as professor for building technologies at the OST Eastern Switzerland University of Applied Sciences, Campus Rapperswil.

In his professional career, he has carried out various industrial development projects, among others on building and system control at Fr. Sauter AG, and chaired several national and international research projects, in particular in the Heat Pump Program HPT of the International Energy Agency IEA. In this context, he also contributed to the heat pump part of the CEN standard series supporting the implementation of the EU Energy Performance of Buildings Directive (EPBD).

La conférence

Heat pumps are seen as future heating system in many scenarios worldwide. However, with increasing integration of heat pumps, sufficient heat sources can become a major obstacle, in particular for higher heating capacities and in existing buildings.

In the conference, two strategies to overcome limitations of the most common individual heat sources used in Switzerland, outdoor air and the ground, are presented.

By the integration of two or more heat sources a monovalent heat pump operation is enabled. A first strategy uses the ground for peak load coverage and air as base load overcoming space limitations for the boreholes and increasing the performance compared to outdoor air as only heat source. The second strategy of a regeneration of the ground source also allows for much smaller borehole fields, when e.g. outdoor air is used as regeneration source and for summer operation.

As conclusion, simulations confirm that heat source integration has the potential to overcome limitations of individual heat sources while exploiting performance and cost benefits due to synergies among the sources. As outlook ongoing and upcoming P&D projects of multisource applications are introduced.