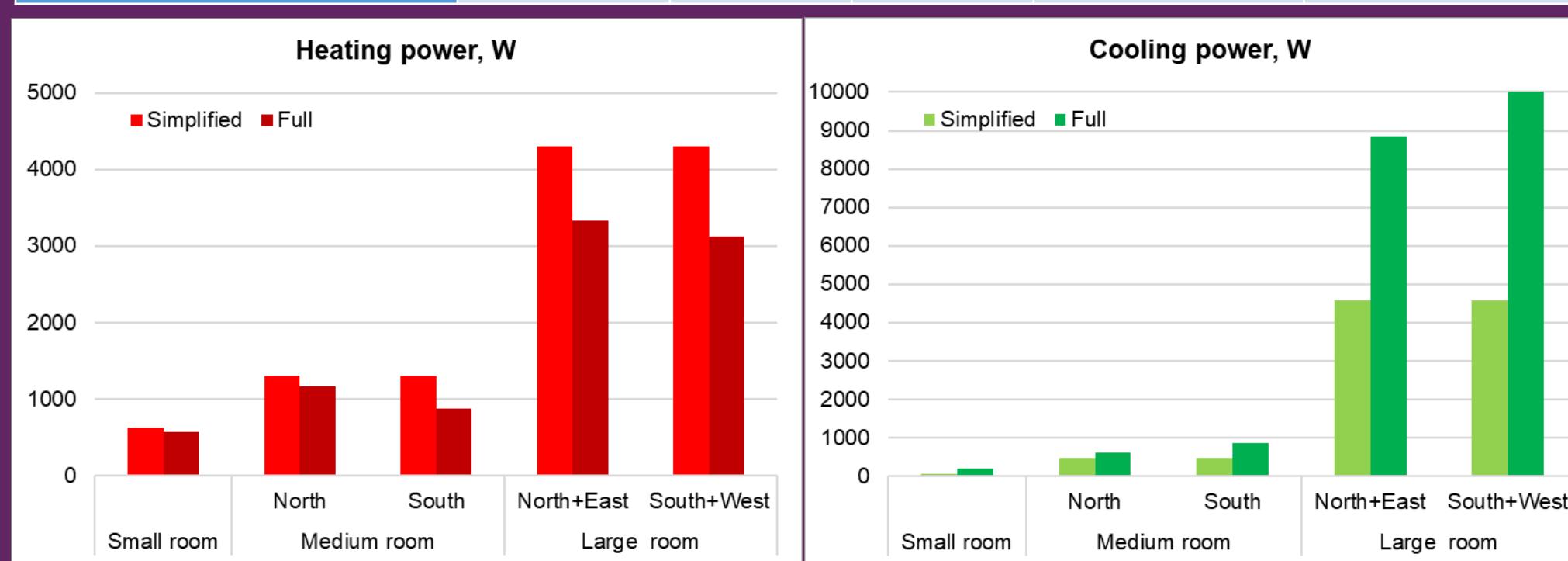


# Specific calculations of a radiant capillary heat exchanger's power for heating and cooling

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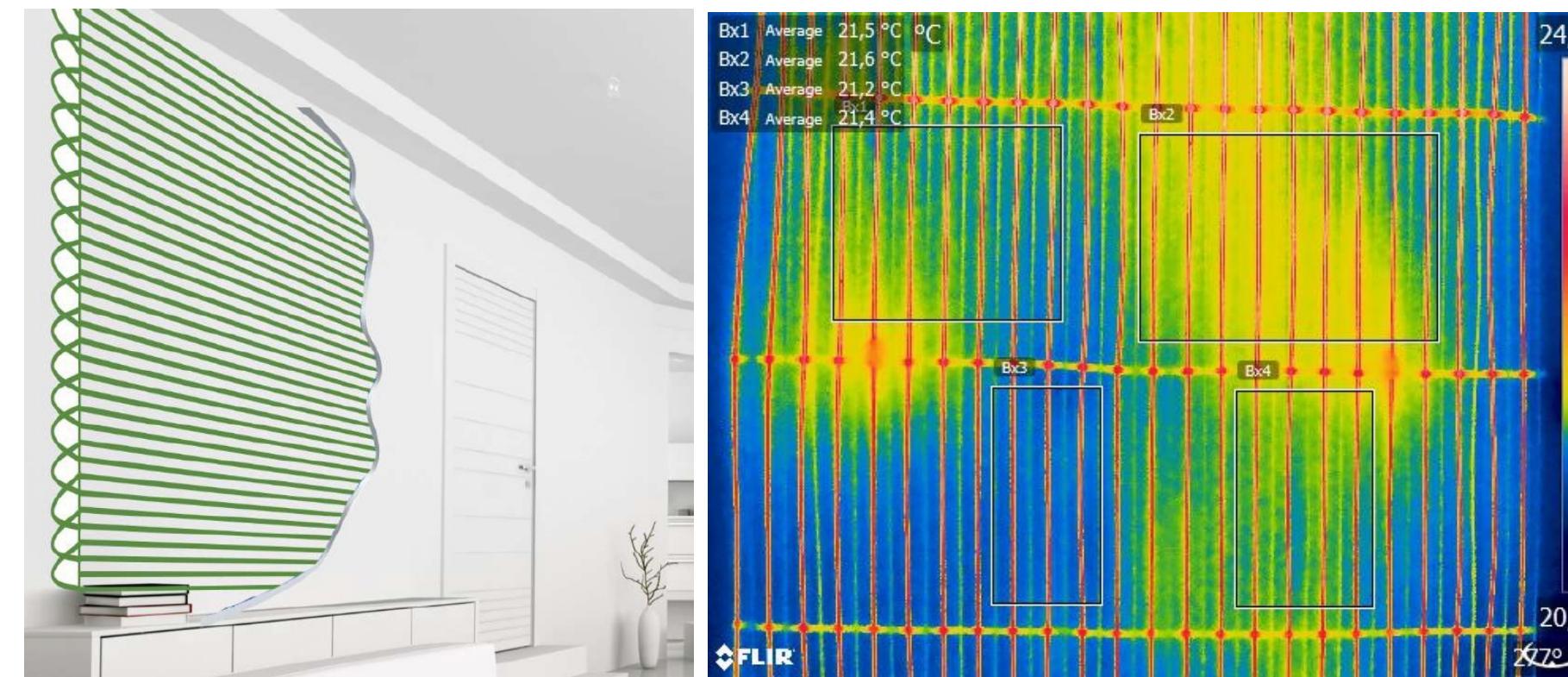
## Calculated heating/cooling power for different rooms using two approaches

	Small room	Medium room		Large room	
		North	South	North+East	South+West
Heating power (W)					
simplified method	624	1299	1299	4305	4305
full method (%)	565	1158	869	3322	3115
(-9%)	(-11%)	(-33%)	(-23%)	(-28%)	
Cooling power (W)					
simplified method	51	480	480	4567	4567
full method (%)	178	608	869	8850	10,756
(+249%)	(+27%)	(+81%)	(+94%)	(+136%)	



- In case of heating, the simplified method overestimates the required power, but in case of cooling it underestimates cooling power.
- The differences between results are smaller for heating cases and much higher for cooling cases. The use of a simplified calculation method for cooling cases is not recommended in general.
- The effect of the rooms' spatial orientation is important for cooling case with significant solar gains.
- The power needed for cooling is higher for the large room with 100% of glazing facades, therefore the use of simplified method here yields incorrect results.

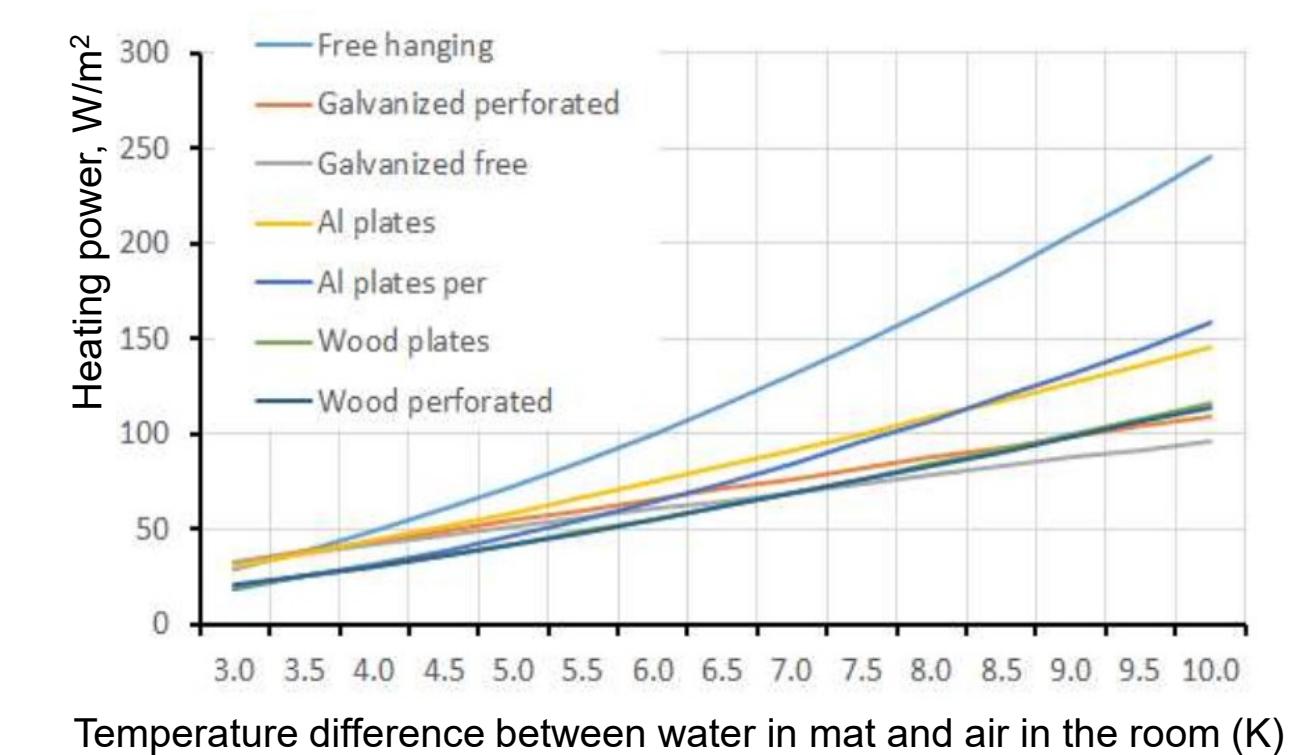
## Capillary heat exchangers



### Features and advantages:

- limestone does not accumulate in water capillary mats thanks to the low water temperatures
- mud (results from corrosion) does not occur in water capillary mats;
- mats can be easily repaired if necessary – a capillary is cut and both ends are welded;
- do not require any specific maintenance for dozens of years.

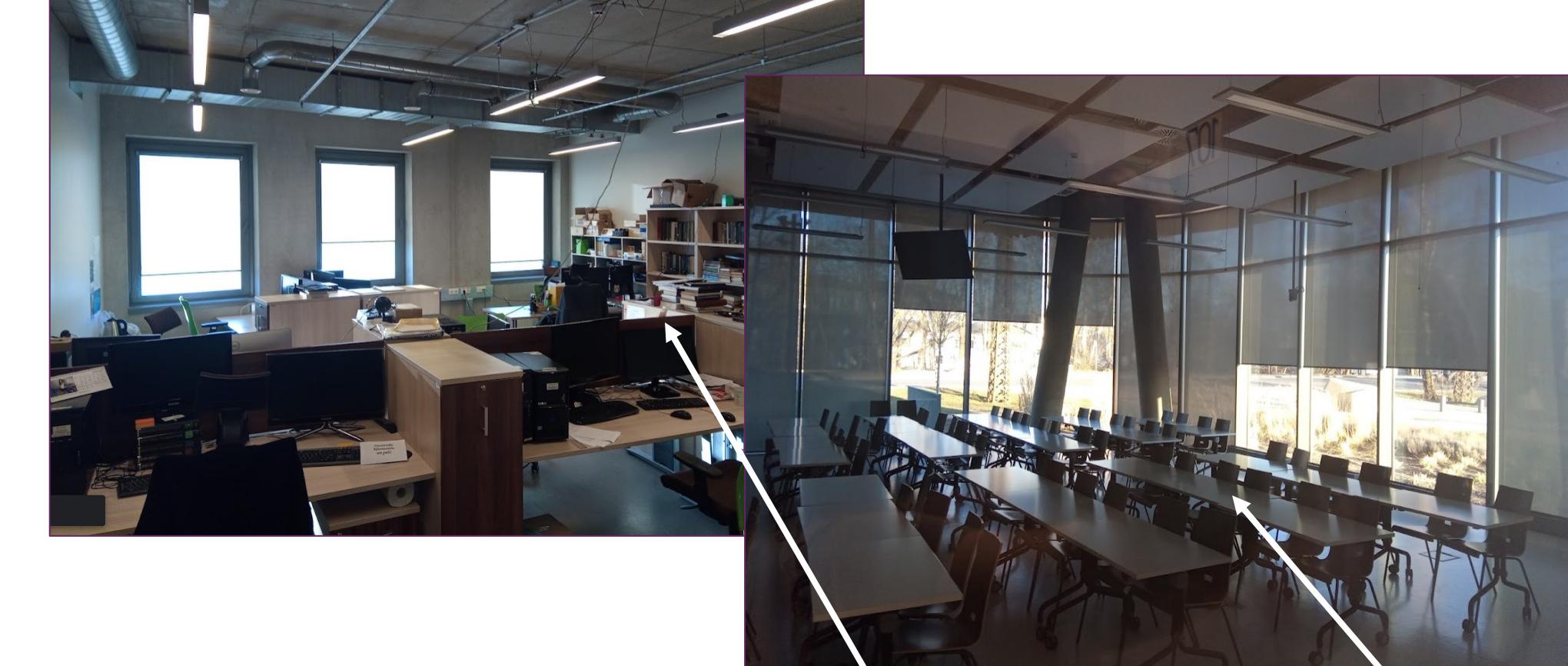
## Heating power



Provided power depends on installation type

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## Modelled rooms



	Small room	Medium room	Large room
Heated area ( $m^2$ )	9	49	96
Height (m)	3	3	4
Volume ( $m^3$ )	27	147	384
Outer walls ( $m^2$ )	36	14	0
Indoor walls ( $m^2$ )	0	70	80
Glazing ( $m^2$ )	0	4	80
Glazing orientation	-	North South	North+East South+West

## Modelling approaches

To analyze the influence of input data and variations in results, full and simplified ISO 52016-1 standard-based modelling approaches are used for heating and cooling modelling

