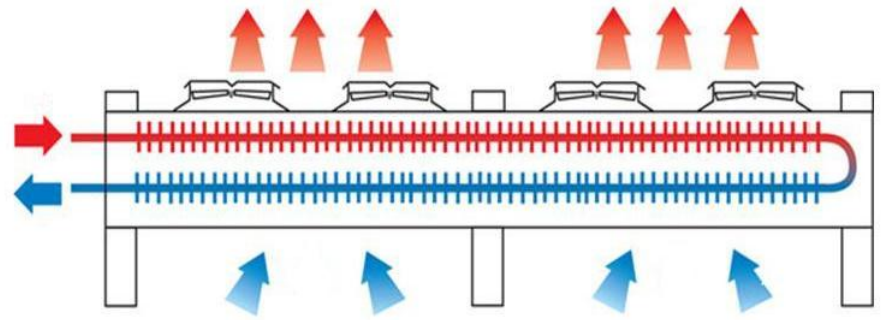
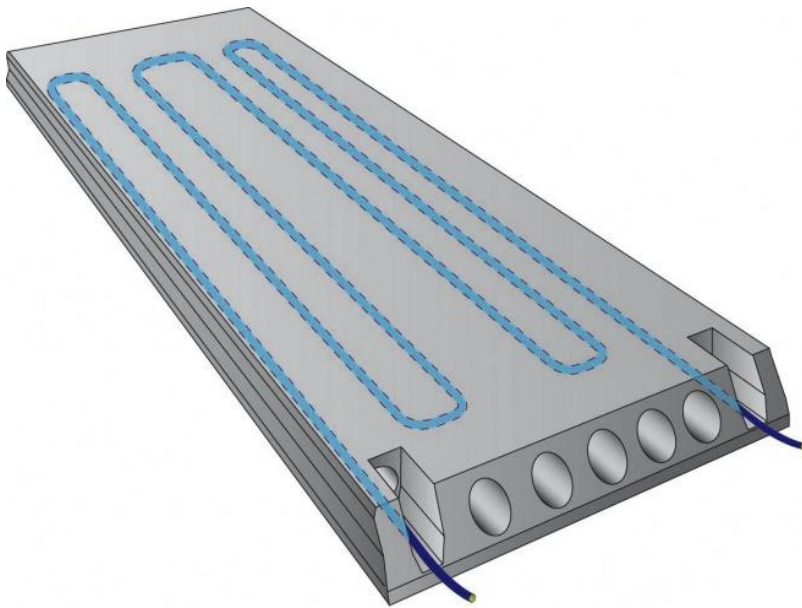


Savings Potential with Thermo-active Ceilings & Free Cooling

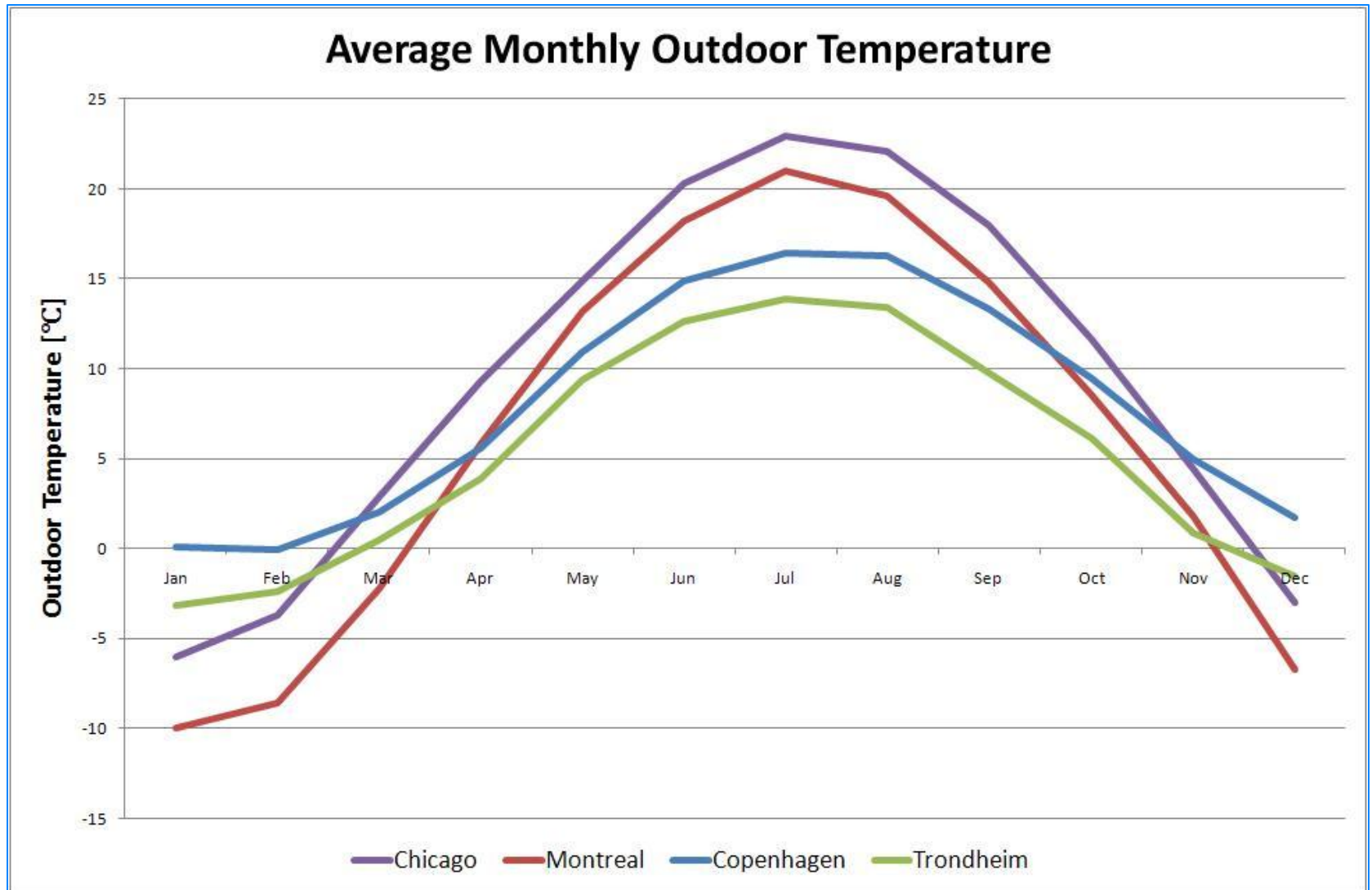
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How Simply Can it Be?

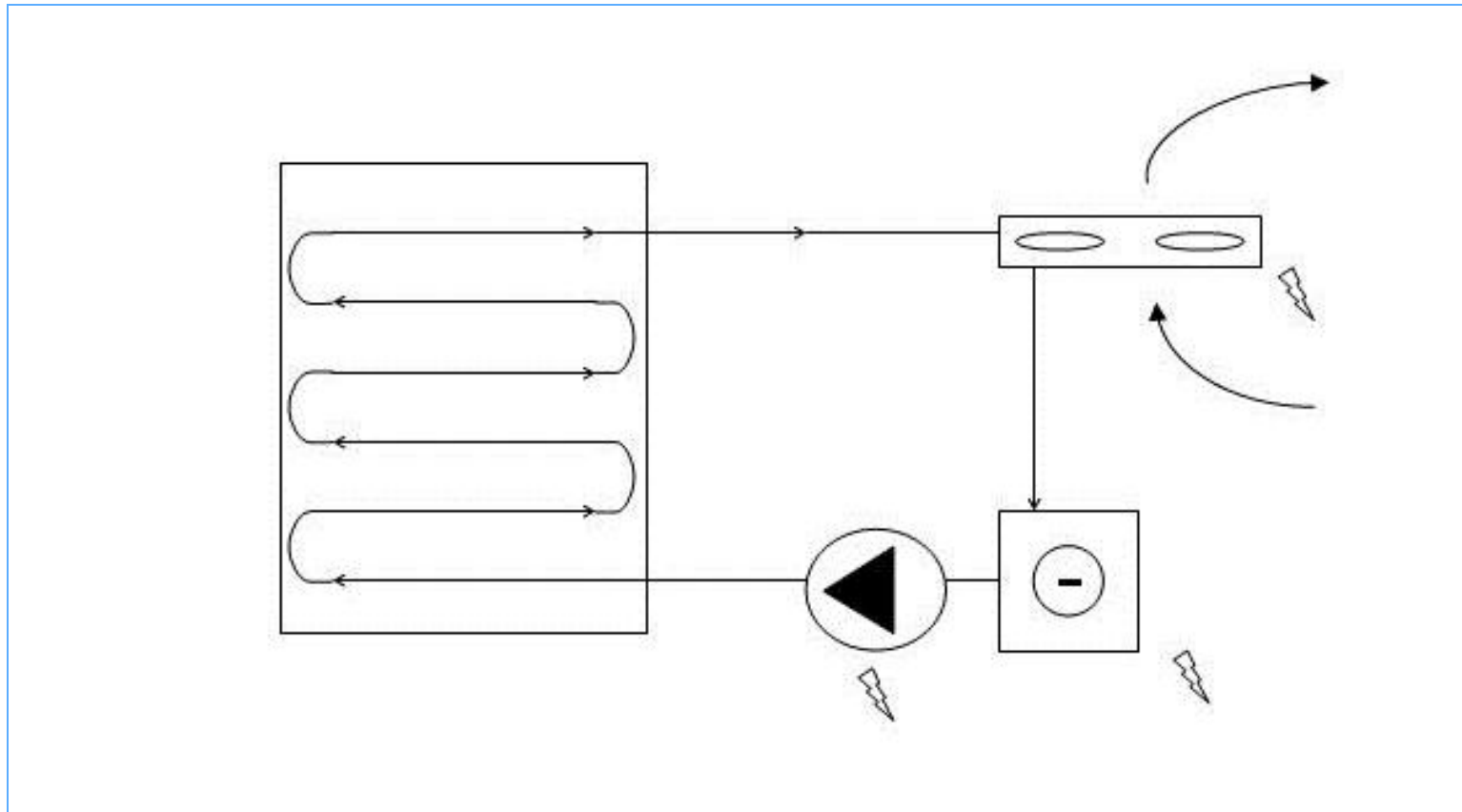
Imbedded Plastic Pipes & Outdoor Ambient Air



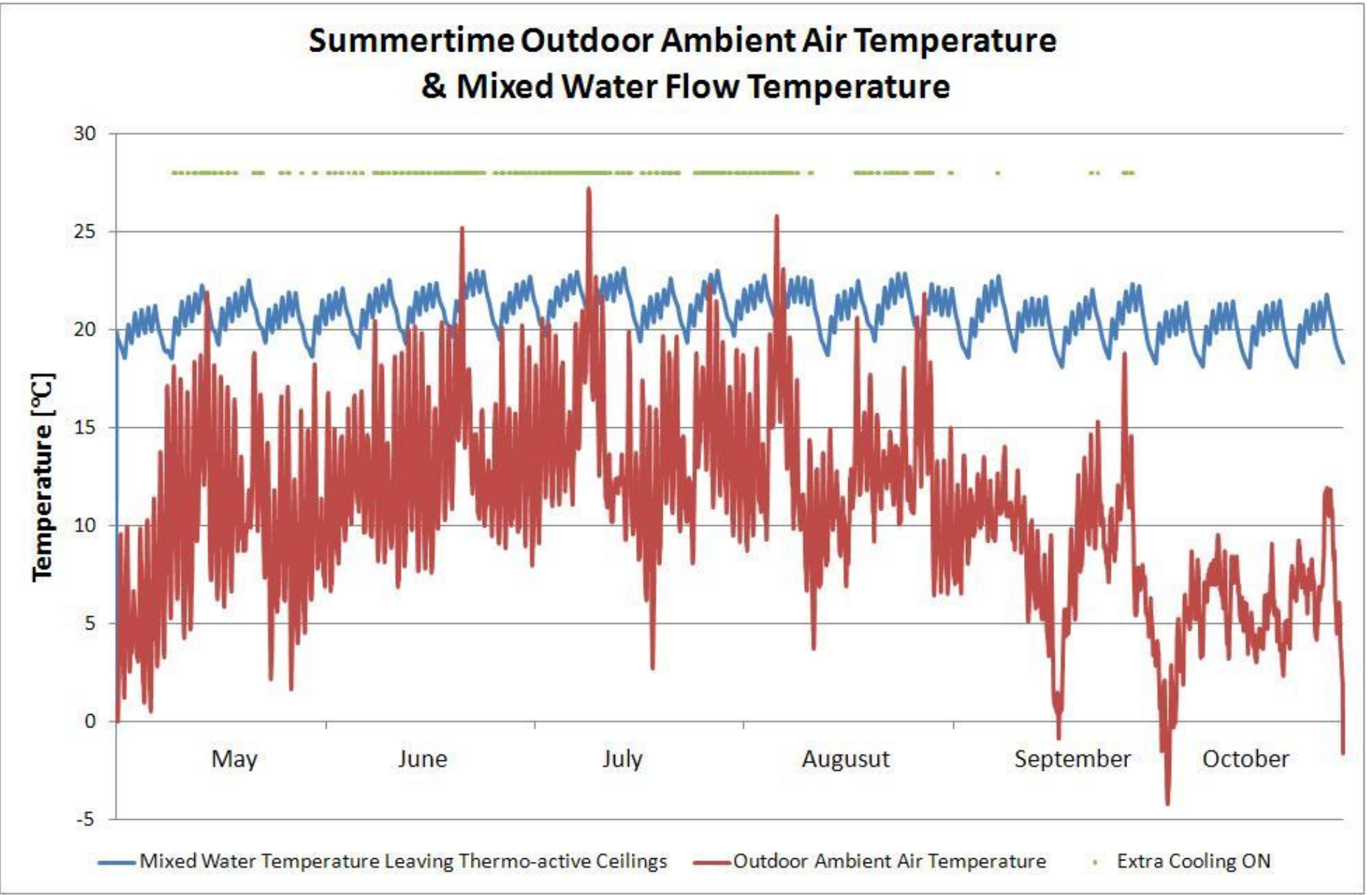
Northern Climates



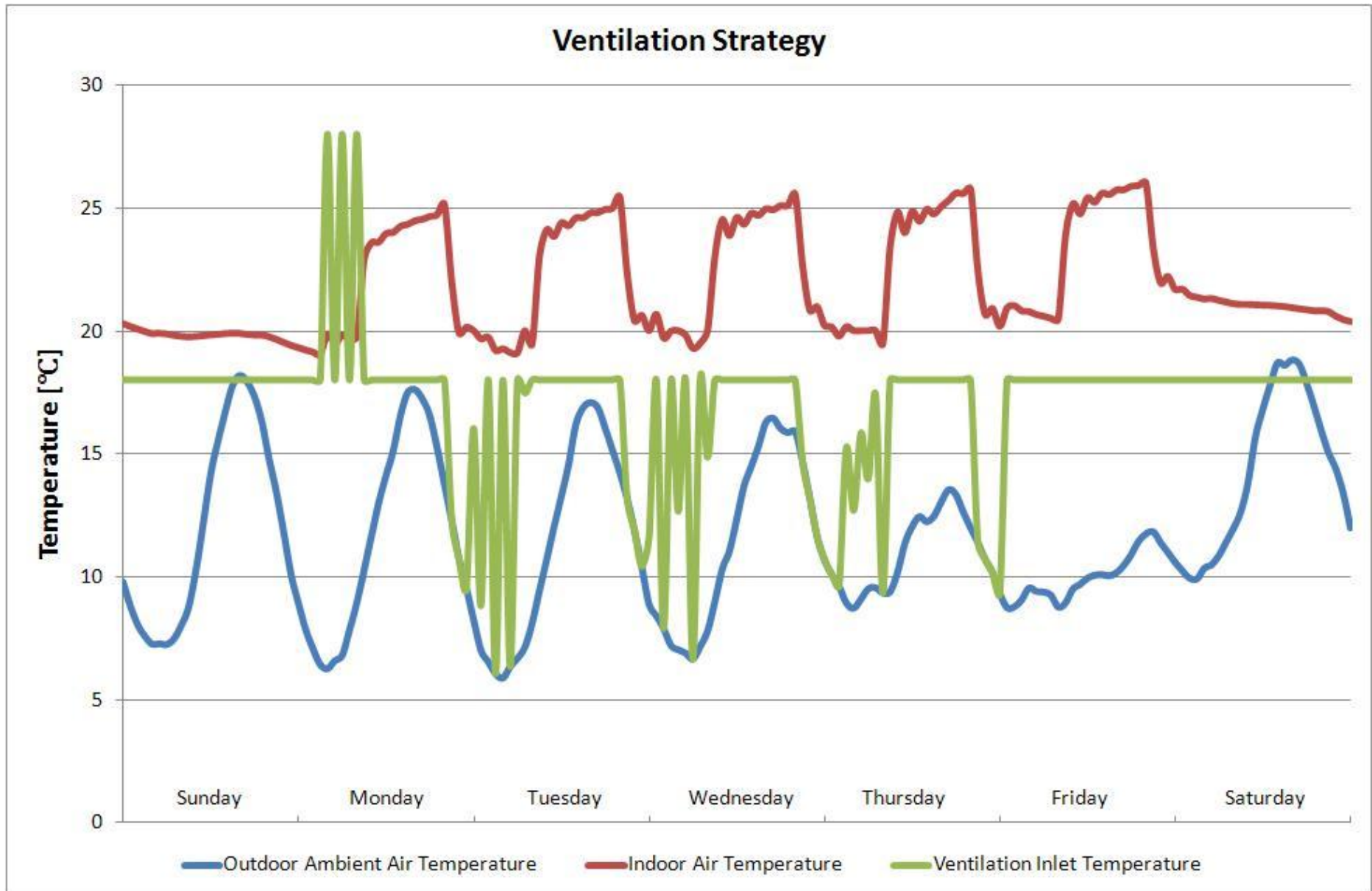
In case we need more cooling!



Summertime Cooling



Is that all? Do we need to do anything else?



Savings Potential – 50 W/m² Internal Heat

Annual Energy Use [kWh/m ²]	Normal	Thermo-active + Free Cooling
Ventilation Heating Demand	8.0	8.6
Ventilation Cooling Demand	1.7	1.7
Space Heating Demand	0.8	-
Space Cooling Demand	61.0	-
Free Cooling Fan Energy Demand	-	0.7
Auxiliary Water Cooling Demand	-	4.6
Extra Pumping Energy	-	2.0

System	Component	Thermal Demand		COP 3	COP 4	COP 5
Normal	Space Cooling Demand	61.0	⇒	20.3	15.3	12.2
Thermo-active ceiling with Free Cooling	Auxiliary Water Cooling Demand	4.6	⇒	1.5	1.2	0.9
	Free Cooling Electrical Demands			2.7	2.7	2.7
Savings Potential [kWh/m²]				16.1	11.4	8.6

Advantages

- Lower Energy Costs
- Initial Investment Costs may potentially be balanced out by the reduction in heating and ventilation equipment – radiators/cooling panels no longer necessary
 - ⇒ Frees up floor space usually used by radiators

Thanks for your attention!!!

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