Heat pump emissions

The emissions per kWh of heat supplied are equal to the sum of the emissions related to the electricity production and distribution plus the emissions of the production, installation and decommissioning of the centralized or decentralized heat pump.

The emissions related to the electricity supply (production&distribution) cannot be calculated as they are scenario dependent.

The emissions related to the production, installation and decommissioning of a heat pump come from the Ecoinvent V2.2 dataset [1]: heat pump, brine-water, 10kW, CH, [unit].

CO_2-eq. emissions [kgCO_2-eq./unit]	1687
Deposited waste [UBP/unit]	64044

Knowing the capacity factor (0.34), the life time of the system (25 years) and the COP, the emissions per kWh of heat supplied can be calculated:

CO_2-eq. emissions [kgCO_2-eq./kWh$_{th}$]	5.00E-4
Deposited waste [UBP/kWh$_{th}$]	0.0190

If these emissions are compared to those for the actual electricity supply in Switzerland (0.125 kgCO_2-eq./kWh$_e$ and 179.27 UBP/kWh$_e$), it can be stated that the emissions attributed to the heating system are negligible.

References

[1] Ecoinvent V2.2