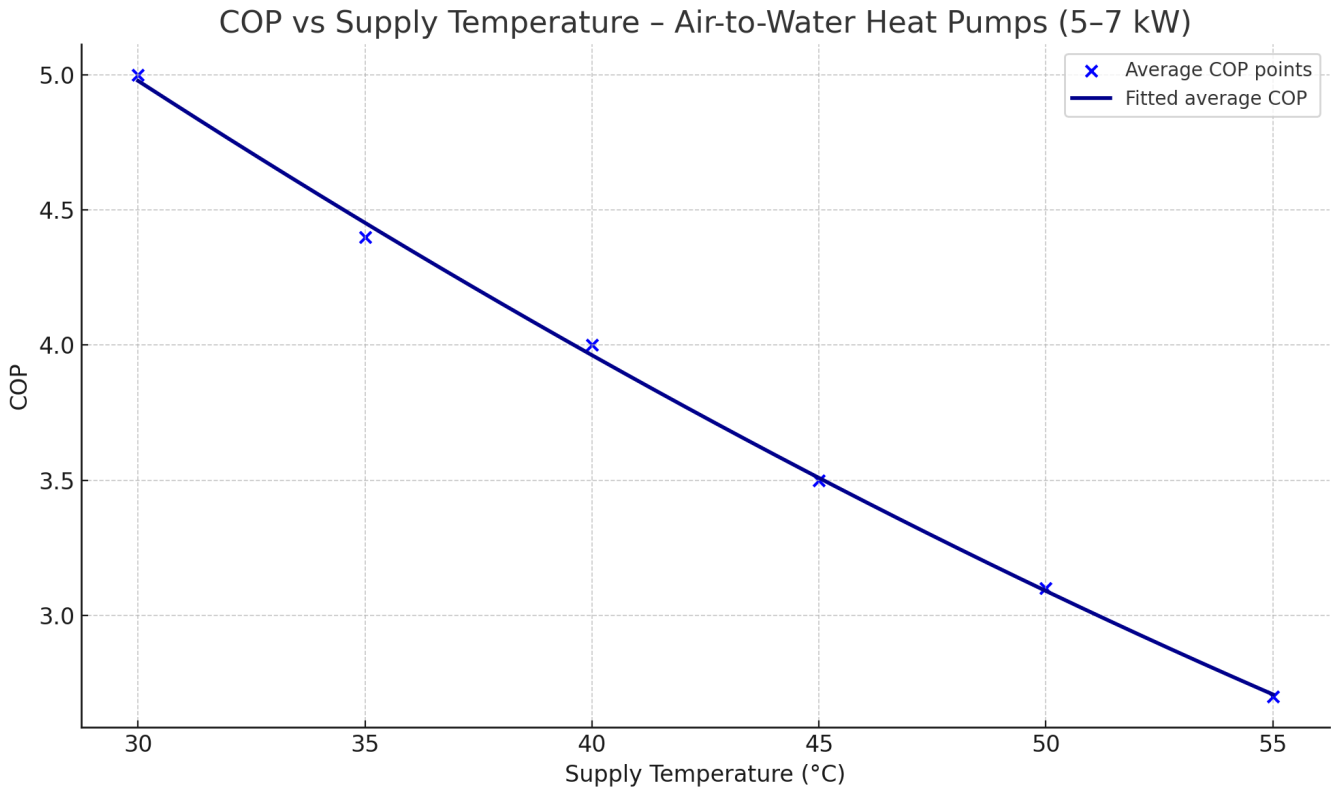
Report: COP vs Supply Temperature - Air-to-Water Heat Pumps

This report summarizes typical COP values for air-to-water heat pumps (5-7 kW) as a function of supply water temperature. Data are based on manufacturer datasheets and published performance curves. The graph shows the average COP behavior and a quadratic fit across supply temperatures from 30 to 55 degrees Celsius.

Fitted COP formula (supply temperature):

COP(T) = 0.00 + -0.152*T + 8.88286*T^2



Customizing the COP Formula with a Scaling Factor

To adapt the general COP formula to a specific heat pump model, users can apply a scaling factor 'k'. This modifies the formula as:

$$COP_{user}(T) = k * (a + b*T + c*T^2)$$

To estimate 'k', compare your unit's datasheet COP at a specific supply temperature (e.g. 45 degC) with the average fit:

$$k = COP_{datasheet}(45\ degC) / COP_{generic}(45\ degC) \sim COP_{datasheet} / 3.5$$

This method provides reliable approximation for typical air-to-water units.

Model	COP @ 45 degC	Est. k	Deviation
Daikin Altherma 3	3.60	1.03	< ±0.2
Panasonic Aquarea	3.40	0.97	< ±0.3
Generic modern	3.50	1.00	< ±0.3
Mitsubishi Ecodan	3.30	0.94	< ±0.3
Vaillant aroTHERM plus	3.80	1.09	< ±0.2