
HydD_mfb30_real_dryN- CityBAS_dryN_{Ac}1.0x58.086V_{ice}0.2x58.086HP1.0x18.4 Year0

Energy generation costs

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Table 1: Assumptions for calculation of heat generation costs

Rate	3.0 % per annum
Analysis period	30 years
Maintenance	1.0 % of Investment costs per year
Electricity	Fix costs: 0 Fr. per year Variable costs: 0.20 <i>Fr. per kWh</i>
Increase of electricity costs	0.0 % per year
Electricity costs year 1	5000 Fr. in year 1
Energy demand per year	57953 kWh

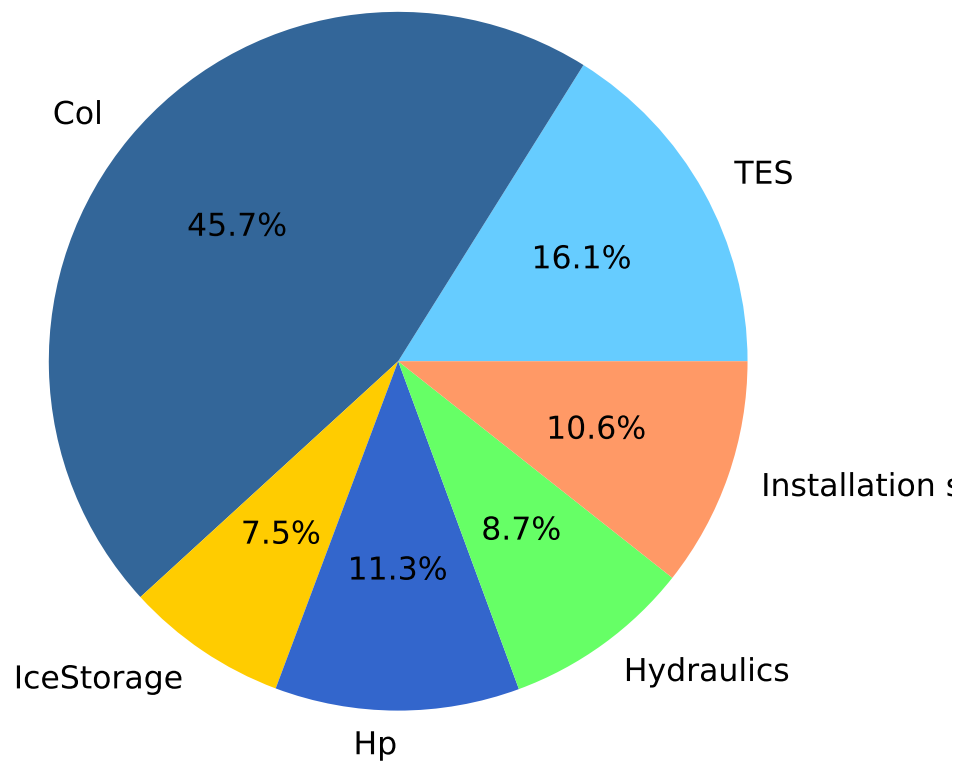


Figure 1: System cost

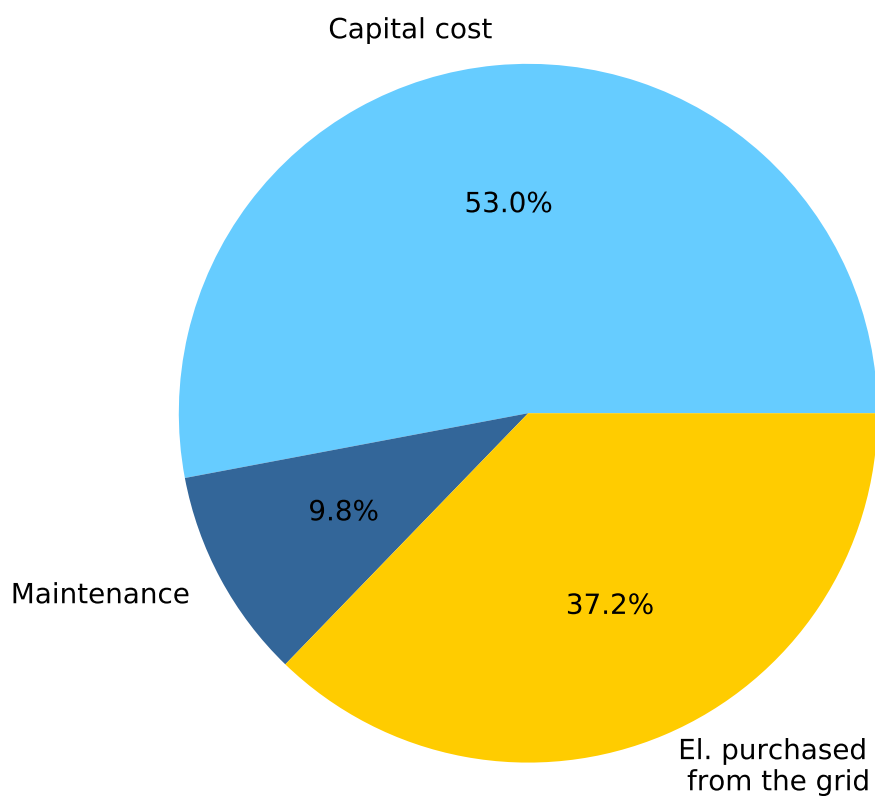


Figure 2: System cost annuity share

Table 2: System and Heat generation costs (all values incl. 8% VAT)

Group	Component	Costs [CHF]	Size	LifeTime Years	Total Costs [CHF]
TES	Storage (Stainless Steel)	-2000+10173 ⁺²⁵⁰ ₋₁₀₀ /m ³	2.00 m ³	30	18345.6 ^{+500.0} _{-200.0} (13.9 ^{+0.4%} _{-0.2%})
	Storage (Steel)	666+1214/m ³	1.30 m ³	30	2238.2 (1.7 ^{+0.0%} _{-0.0%})
	electric rod	600+0/m ³	2.00 m ³	30	600.0 (0.5 ^{+0.0%} _{-0.0%})
	Total TES				21183.8 ^{+500.0} _{-200.0} (16.1 ^{+0.4%} _{-0.2%})
Col	Collector	9282+875/m ²	58.09 m ²	30	60107.2 (45.7 ^{+0.1%} _{-0.2%})
IceStorage	Ice Storage (inc. installation)	0+850/m ³	11.62 m ³	20	9874.6 (7.5 ^{+0.0%} _{-0.0%})
Hp	HeatPump	8194+363/kW	18.44 kW	20	14888.4 (11.3 ^{+0.0%} _{-0.0%})
Hydraulics	Hydraulics	11500+0/kW	18.44 kW	30	11500.0 (8.7 ^{+0.0%} _{-0.0%})
Installation system	Installation System	14000+0/kW	18.44 kW	30	14000.0 (10.6 ^{+0.0%} _{-0.0%})
	Total Investment Cost				131554.09^{+500.00}_{-200.00} (100%)
Annuity	Annuity (yearly costs over lifetime)				13428 ⁺³¹ ₋₁₂ /a
	Share of Investment				7113 ⁺²⁶ ₋₁₀ /a (53 ^{+0%} _{-0%})
	Share of Electricity				5000 /a (37 ^{+0%} _{-0%})
	Share of Maintenance				1316 ⁺⁵ ₋₂ /a (10 ^{+0%} _{-0%})
	Share of Residual Value				0 /a (0%)
Present Value	Present Value of all costs				255338.67 ^{+598.00} _{-239.20} CHF
Energy Generation Costs	Using annuity:			23.17 ^{+0.05} _{-0.02}	Rp./kWh