

System6_SolarIce_MFH30_flatPlate_HP20- CHE_tmy-Ac50-Vice20

Energy generation costs

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Table 1: Assumptions for calculation of heat generation costs

Rate	3.0 % <i>per annum</i>
Analysis period	30 <i>years</i>
Maintenance	1.0 % <i>of Investment costs per year</i>
Electricity	Fix costs: 0 <i>Fr. per year</i> Variable costs: 0.20 <i>Fr. per kWh</i>
Increase of electricity costs	0.0 % <i>per year</i>
Electricity costs year 1	4238 <i>Fr. in year 1</i>

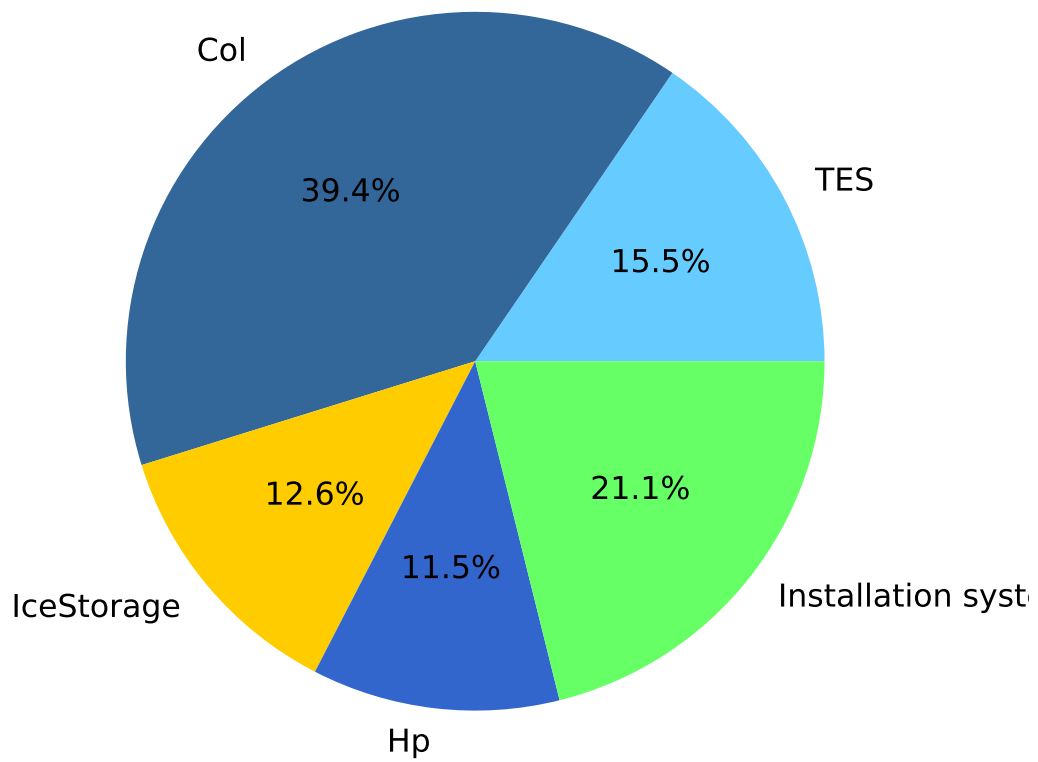


Figure 1: System cost

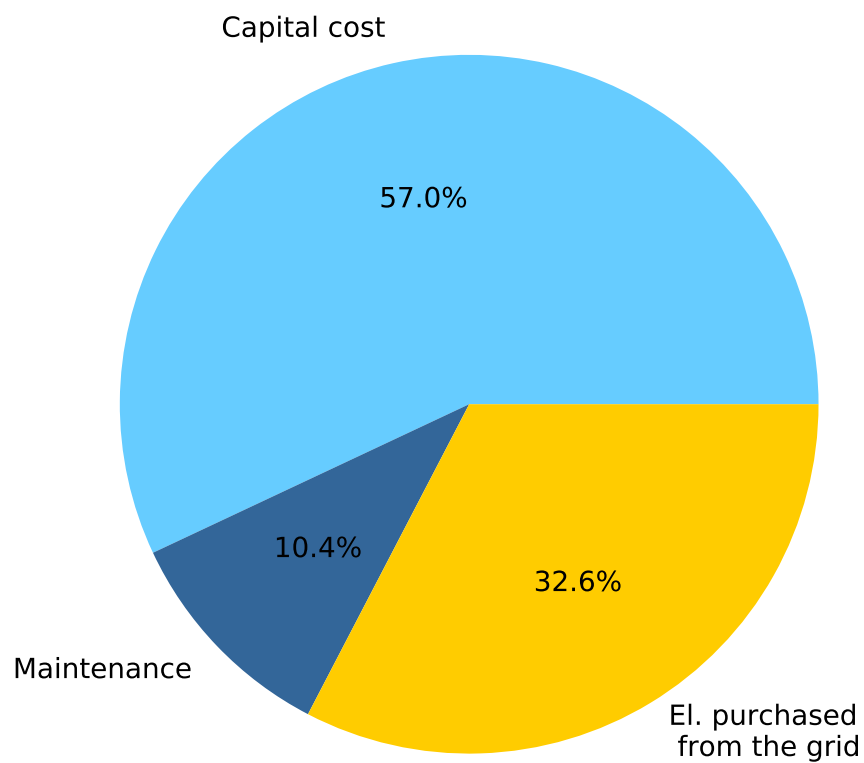


Figure 2: System cost annuity share

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/m ³	2.00 m ³	30	18345.6 (13.6 %)
	Storage (Steel)	666+1214/m ³	1.00 m ³	30	1879.8 (1.4 %)
	electric rod	600+0/m ³	2.00 m ³	30	600.0 (0.4 %)
	Total TES				20825 (15.5 %)
Col	Collector	9282+875/m ²	50.00 m ²	30	53032.0 (39.4 %)
IceStorage	Ice Storage (inc. installation)	0+850/m ³	20.00 m ³	20	17000.0 (12.6 %)
Hp	HeatPump	8194+363/kW	20.00 kW	20	15454.0 (11.5 %)
Installation system	Installation System (Hydraulics)	24596+193/kW	20.00 kW	30	28456.0 (21.1 %)
	Total Investment Cost				134767.40 (100%)
Annuity	Annuity (yearly costs over lifetime)				12987 CHF/a
	Share of Investment				7401 CHF/a (57%)
	Share of Electricity	0+0.20/kWh	21190 kWh		4238 CHF/a (33%)
	Share of Maintenance				1348 CHF/a (10%)
	Share of Transmission grid	0+0.00/kWh	35979 kWh		0 CHF/a (0%)
Present Value	Share of Residual Value				-0 CHF/a (-0%)
	Present Value of all costs				244249.14 CHF
Energy Generation Costs	Using annuity:			26.35	Rp./kWh