HydD_mfb30_real_dryN-CityBAS_dryNAc1.0x58.086Vice0.4x58.086HP1.0x18.4 Year0

Energy generation costs

damian.birchler
damian.birchler

2021/03/11 at: 08:52:48 h

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 $Fr.\ per\ kWh$
Increase of electricity costs	0.0 % $per\ year$
Electricity costs year 1	4698 Fr. in year 1

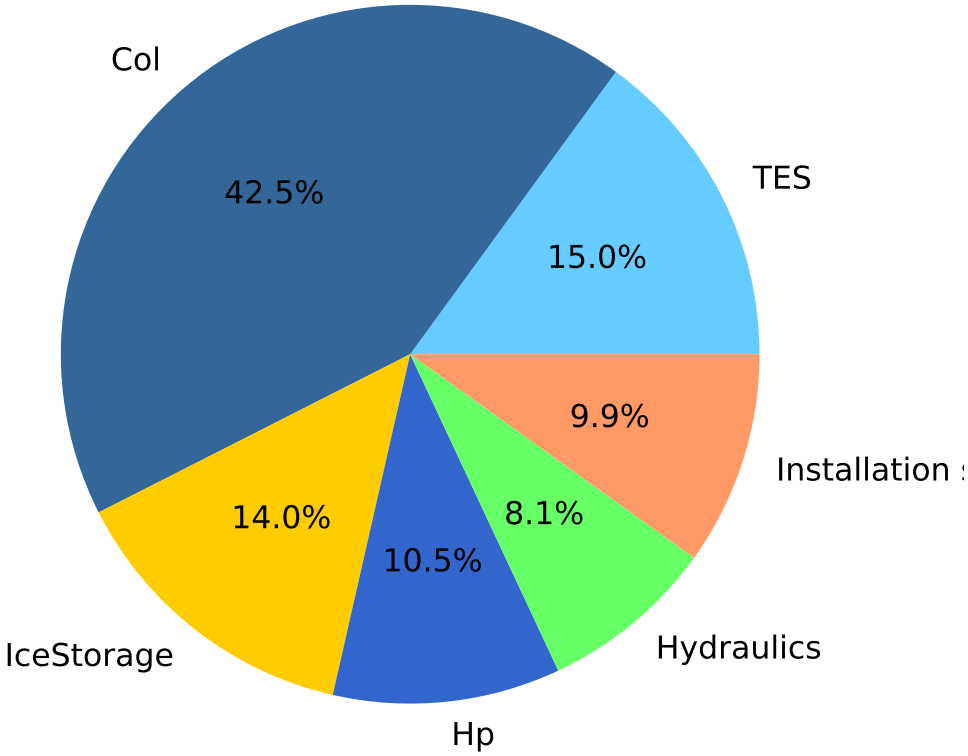

Figure 1: System cost

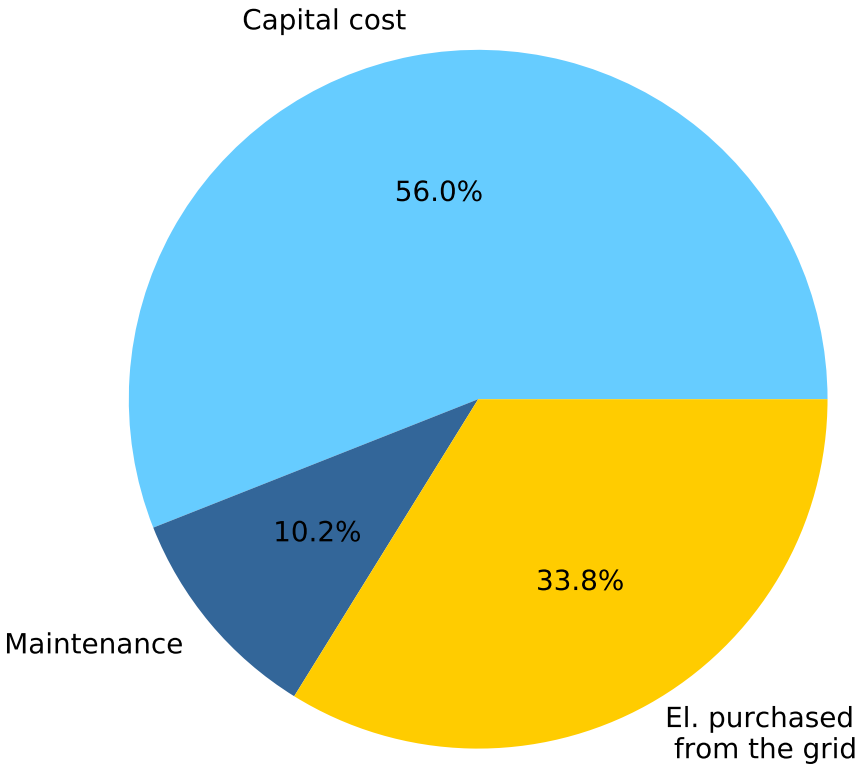

Figure 2: System cost annuity share

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$^{+500.0}_{-200.0}$ (13.0$^{+0.4}_{-0.2}$%)
	Storage (Steel)	666+1214/m^3	1.30 m^3	30	2238.2 (1.6$^{+0.0}_{-0.0}$%)
	electric rod	600+0/m^3	2.00 m^3	30	600.0 (0.4$^{+0.0}_{-0.0}$%)
	Total TES				21183.8$^{+500.0}_{-200.0}$ (15.0$^{+0.4}_{-0.2}$%)
Col	Collector	9282+875/m^2	58.09 m^2	30	60107.2 (42.5$^{+0.1}_{-0.1}$%)
IceStorage	Ice Storage (inc. installation)	0+850/m^3	23.23 m^3	20	19749.2 (14.0$^{+0.0}_{-0.0}$%)
Hp	HeatPump	8194+363/kW	18.44 kW	20	14888.4 (10.5$^{+0.0}_{-0.0}$%)
Hydraulics	Hydraulics	11500+0/kW	18.44 kW	30	11500.0 (8.1$^{+0.0}_{-0.0}$%)
Installation system	Installation System	14000+0/kW	18.44 kW	30	14000.0 (9.9$^{+0.0}_{-0.0}$%)
	Total Investment Cost				**141428.71**$^{+500.00}_{-200.00}$ (100%)
Annuity	Annuity (yearly costs over lifetime)				13889$^{+31}_{-12}$ /a
	Share of Investment				7777$^{+26}_{-10}$ /a (56$^{+0}_{-0}$%)
	Share of Electricity	0+0.20/kWh	23491 kWh		4698 /a (34$^{+0}_{-0}$%)
	Share of Maintenance				1414$^{+5}_{-2}$ /a (10$^{+0}_{-0}$%)
	Share of Residual Value				0 /a (0%)
Present Value	Present Value of all costs				261237.88$^{+598.00}_{-239.20}$ CHF
Energy Generation Costs	Using annuity:			23.96$^{+0.05}_{-0.02}$	Rp./kWh