ECONOMICS

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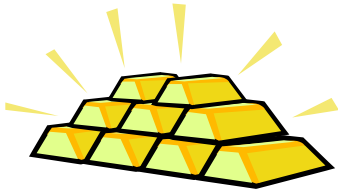
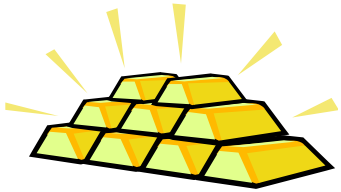


Investment costs

Approximate collector area	Collector technology	System cost [EP/m^2]
30	Vacuum Tube	2.700
100	Flat Plate	3.400
150	Flat Plate	2.700
150	Flat Plate	1.600

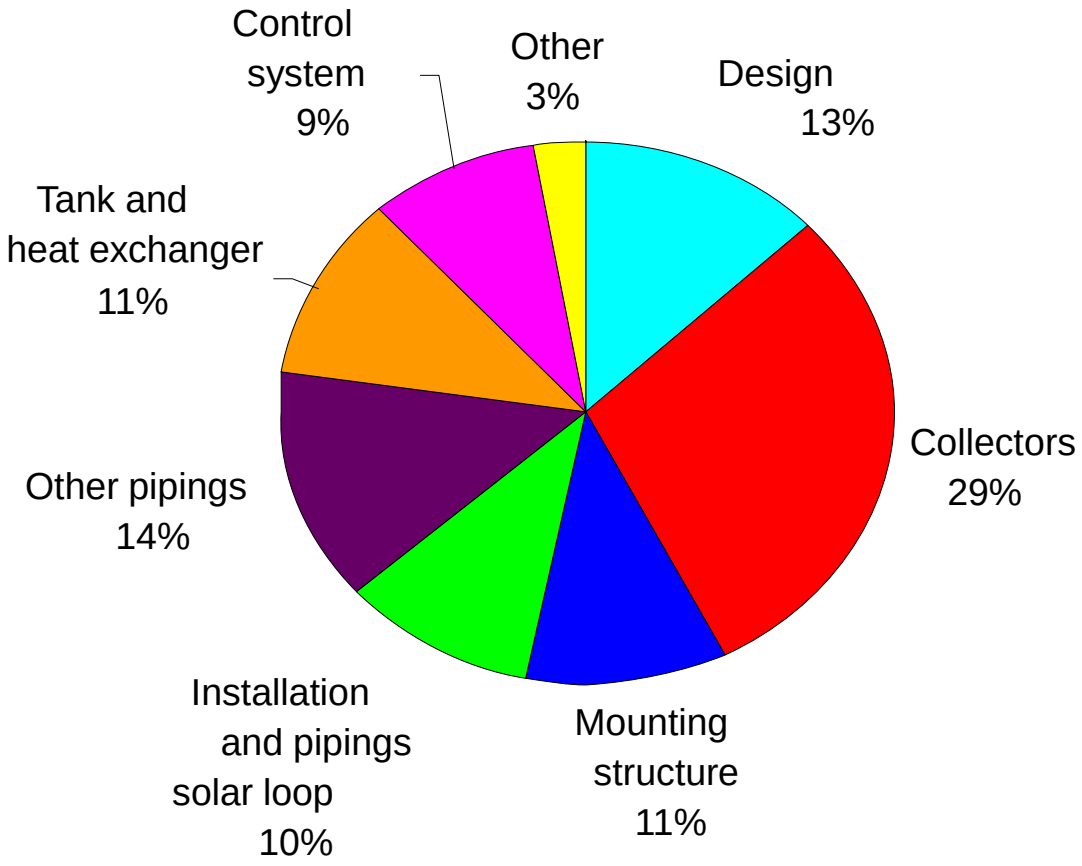
Collective vs. small systems:
According to European experience, collective systems are much cheaper than small systems (80 % - 50 % of small scale investment costs).



Investment costs

Collective solar thermal systems in Germany

[Source: Solarthermie 2000]



Achievable savings – gas

Small natural circulation system (e.g. 6 m^2 collector area, solar fraction ca. 90 %)

Cost of gas	0,03	EP/m^3
Solar energy production (Alexandria, Hurgada)	Alex. 4.600 Hurg. 6.700	kWh/y
Auxiliary boiler efficiency	85	%
Energy savings	Alex. 5.410 Hurg. 7.880	kWh/y
Gas savings	Alex. 490 Hurg. 716	m^3/y
Economic savings	Alex. 14 Hurg. 21	EP/y

Pay-back time is higher than system's lifetime…

Achievable savings – electricity

Small natural circulation system (e.g. 6 m^2 collector area, solar fraction ca. 90 %)

Cost of electricity	0,23*	EP/kWh
Solar energy production (Alexandria, Hurgada)	Alex. 4.600 Hurg. 7.050	kWh/y
Electric boiler efficiency	95	%
Electricity savings	Alex. 4.840 Hurg. 7.420	kWh/y
Economic savings	Alex. 1.110 Hurg. 1.700	EP/y
Pay-back for 3.500 EP/m^2	Alex. 19 Hurg. 12,3	y
Pay-back for 2.500 EP/m^2	Alex. 13,5 Hurg. 8,8	y

* Excluding fix tarif for peak demand

Achievable savings – electricity

Large forced circulation system (e.g. 100 m^2 collector area for hotel, solar fraction ca. 90 %)

Cost of electricity	0,5	EP/kWh
Solar energy production (Alexandria, Hurgada)	Alex. 115 Hurg.130	MWh/y
Electric boiler efficiency	95	%
Electricity savings	Alex. 121 Hurg. 136	MWh/y
Economic savings	Alex. 60.500 Hurg. 68.000	EP/y
Pay-back for 2.500 EP/m^2	Alex. 4,1 Hurg. 3,7	y
Pay-back for 2.500 EP/m^2 including 25% subsidy	Alex. 3 Hurg. 2,7	y

* Self generation

!This calculation is valid for a quite good exploitation of solar heat!