

Solar heating/cooling system Promes, Perpignan

Targeted building

CNRS Laboratory Promes (Procédés, Matériaux, et Energie Solaire)

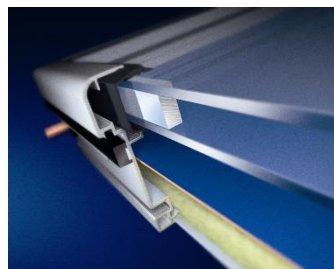
- ✓ 180 m²
- ✓ Location: Perpignan, Mediterranean climate
- ✓ Closely associated with the University of Perpignan Via Domitia (Educational purpose)



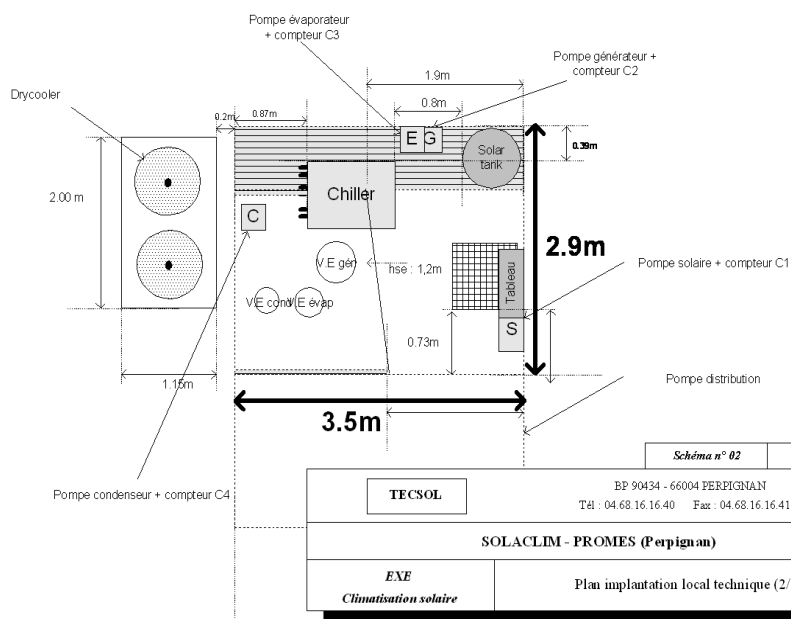
Solar heating/cooling installation

Equipment to be installed

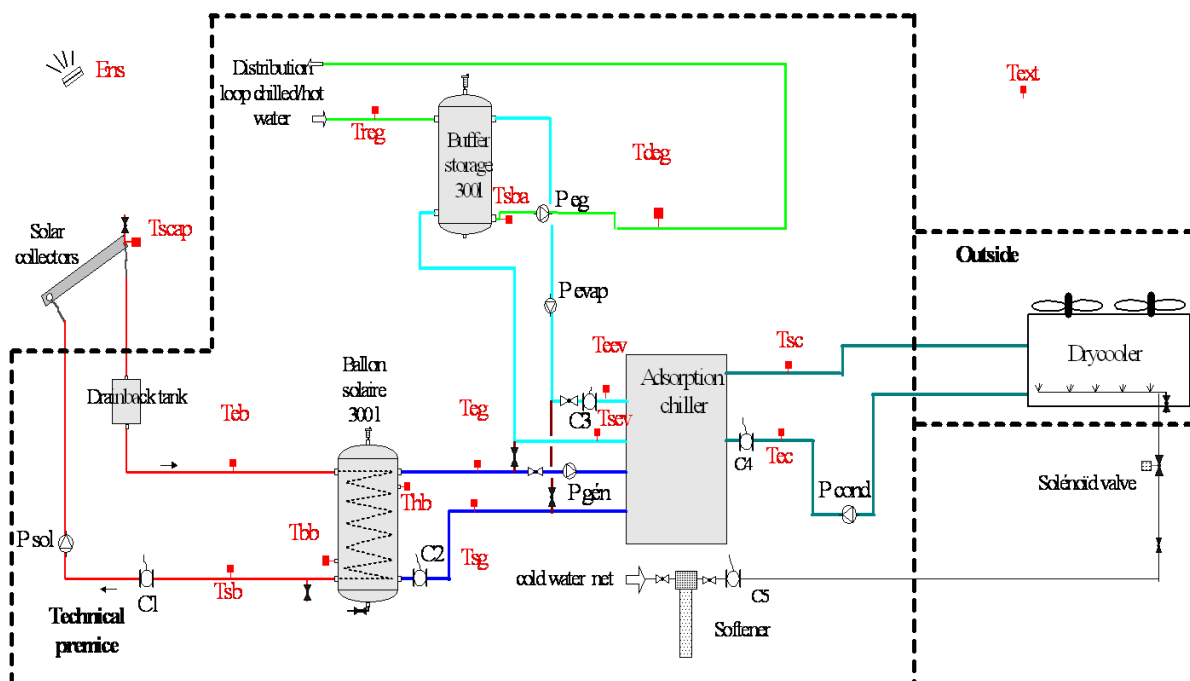
- ✓ Collectors: Schüco flat plate collectors; 25 m²
- ✓ Drain back mode (safety)
- ✓ Adsorption chiller: Sortech, 7.5 kW capacity
- ✓ Heat rejection: Hybrid cooler (dry cooler + spray)



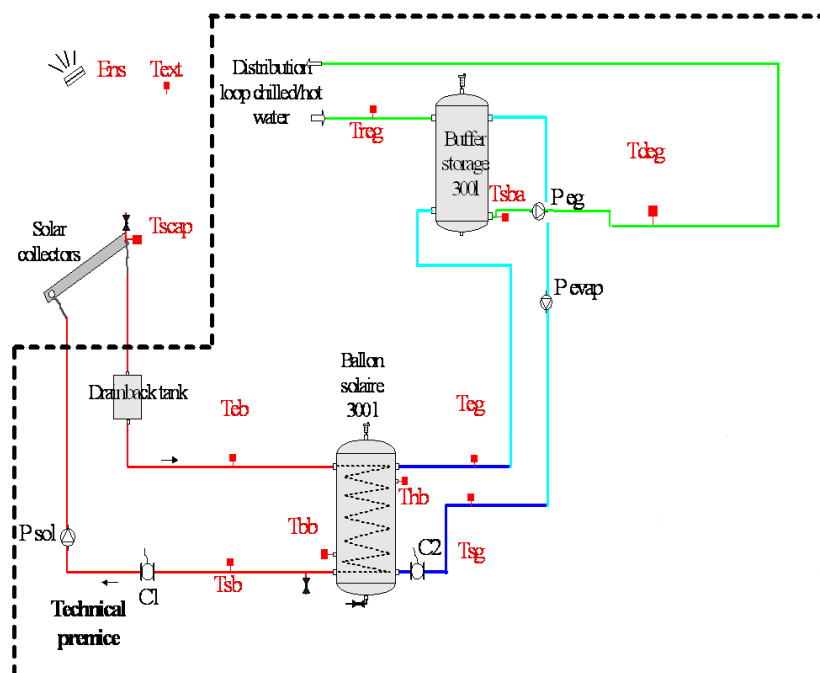
The technical premises



Installation scheme – Cooling



Installation scheme – Heating



Thermal balance

	Solar radiation (kWh)	Energy collected (kWh)	Energy used (kWh)	Electric consumption (kWh)	Collectors yield (%)	Thermal COP (-)	Electric COP (-)
September	-	-	-	-	-	-	-
October	1 902	682	580	55	36	0.85	11.49
November	1 808	605	536	40	33	0.89	14.74
December	1 560	370	292	29	24	0.79	10.79
January	1 766	505	436	31	29	0.86	15.26
February	2 528	918	838	45	36	0.91	20.17
March	3 253	1 423	1 305	58	44	0.92	24.26
April	-	-	-	-	-	-	-
May	2 329	765	227	44	33	0.34	5.52
June	4 414	1 603	457	99	36	0.33	4.89
July	4 656	1 678	454	105	36	0.31	4.64
August	2 679	1 107	290	73	41	0.29	4.27
TOTAL	26 897	9 656	5 416	579	35.9	0.59	10.06

These data are not a calculated forecast but they are real measured data for the installation from September 2008 to August 2009.

Planning

Feasibility study: October 2007

Project implementation phase: Early 2008 to July 2008

Installation startup: July 2008

Monitoring: July 2008 until now

Economic balance

	Object	Estimated costs
Solar system	Solar collection	15 000
	Chiller	13 000
	Piping	12 000
	Equipment (tank, pumps, etc.)	9 000
	Dry cooler	9 000
	Sub-total solar system	58 000
Monitoring	Regulation	7 000
	Monitoring	5 000
	Sub-total monitoring	12 000
	Work sub-total	70 000
	Engineering	5 000
TOTAL PROJECT COSTS (€ HT)		75 000
TOTAL PROJECT COSTS (€ TTC)		89 700

Maintenance (about 2% of the total project cost every year): 1200 €/year

Saved money for primary energy by 20 years:

- 600 €/year (energy +10%/year)
- 350 €/year (energy +5%/year)

Avoided expenses (a heat pump must be replaced every 10 years): 30 000 € by 20 years

Environmental balance

The solar heating/cooling installation will prevent the exhaust of 580 kg of CO₂ every year. This is equivalent to a car traveling 4200 km every year.