CONTANK Parking Service

Castellbisbal, Catalonia, Spain

Others: Industry | 570 sqm installation

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Project Summary

Description
The Castellbisbal's parking service is a new building where the CSTC has been proposed at the design stage. Thus, the roof structure and the distance between the rafters have been set according to the weight and the size of solar collectors. In this facility, liquid freight goods' transportation containers from trucks and railways are cleaned. Part of the cleaning process requires hot water vapour.The daily consumption is about 80,000 l at 70º–80º. The CSTC produces 429 MWh which covers 21 % of the total hot water demand.The installation has a monitoring system that allows detecting system incidences through internet.

Building	
Type of building	Industry
Number of users / dwellings, floors	./.
Year of construction	2005
Total effective area (heated)	./.
Hot tap water consumption (measured/estimated)	not available
Whole energy consumption for heating purpose after CSTS implementation	not available
System engineering	
Year of construction of CSTS	2005
Type of collectors	Flat plate collectors
Thermal power	357 $kW_{therm.}$

Daniel González, Aiguasol Enginyeria:

"The participation in this project gave Aiguasol the opportunity to design a solar thermal installation with industrial purposes, thus, to enter in another market. The CSTS for the Parking Service Castellbisbal has been awarded by several organisations such as Eurosolar and the International Energy Agency as an example of good practice."

Aperture area of collectors*)	510 m2
Buffer storage	40 m^3
Hot tap water storage	6 m^3
Total capacity of boilers with energy source	not available
Type of hot tap water heating	Centralised
Type of heating system	./.

Costs

Total cost solar system	268,546 Euro
Cost of the CSTS / gross area of collectors	471 Euro/m^2
Subsidies	37.9 %

Output

Output of solar heat**)	429,000 kWh/a
Reduction of final energy***)	613,470 kWh/a
CO_2-emissions avoided	not available
Solar performance guarantee	No

*) Aperture area = light transmitting area of the front glass
**) measured, between storage and piping to taps (solar system output)
***) related to the measured output mentioned before

Owner

Parking Service Castellbisbal
Constantino Gonzalez
Travessera de Can Estapé, 5-7 Polígono Industrial Can Estapé
Castellbisbal (Barcelona), Spain
Phone: +34 937089600
Fax: +34 937089601
www.pkgservice.com

Operator

See owner

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Technical description

Description of the CSTS

Year of construction of CSTS	2005
Thermal power	357 $kW_{therm.}$
Gross area of collectors	570 m^2
Aperture area of collectors	510 m^2
Type of collectors	Flat plate collectors
Type of assembly	On flat roof
Orientation of collectors	South-East (-24°)
Inclination angle to horizon	25°
Freezing protection	Primary Propenglycol 30 %
Overheating protection	Expansion vessel, safety valve
Operation mode	Low flow
Use of CSTS for	Industry
Buffer storage	40 m^3 (one storage tank)
Hot tap water storage	6 m^3 (2 × 3 m^3)
Control of backup-system / CSTS	not available

Summary

The CSTS consists of 9 rows of solar collectors connected in parallel, where 4 of the rows have 8 collectors and 5 of the rows have 12 collectors, all tehem connected in series.The row capacity is 910 l/h, summing up a total capacity of 8,189 l/h.

The CSTS has one heat exchanger and a 40,000-litre solar storage tank. Its nominal solar thermal gradient is 36.6 K.

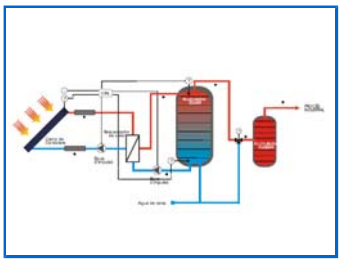
2 primary pumps SEDICAL SIP 50/150.3-2.2/H (rodet 150) = 8,8 kW

2 secondary pumps SEDICAL SAP 50/9T (rodet

Hot tap water system

Type of hot water heating	Centralised
Recirculation system	Yes
For decentralised systems: The installation on the consumer site	./.
Size of storage for hot tap water	./.
Specification (if necessary)	There is a separated back-up heater/boiler for hot tap water heating only (natural gas).

95)



Space heating system

Type of heating system	./.
Number of boilers	./.
Total capacity (power output) of boilers	./.
Capacity of each boiler (year of construction)	./.
Energy source	./.
Type of boiler system	./.

Type of operation

Operator of the CSTS system	Self-operation
CSTS monitoring	Yes: solar radiation, output of solar heat, total water consumption. GAE supervises the data.
Data accessible via internet	Yes
Scientific monitoring / follow up	No
Maintenance contract	Yes: every three months
Visualisation of the solar heat output	No

Yield of CSTS plant

Output of solar heat	429,000 kWh/a
Origin of data	Design (calculated)
Measuring point	not available
Reduction of final energy	613,470 kWh/a
Origin of data	Estimated
Solar performance guarantee	No

Heat consumption

Whole energy consumption for heating purposes after CSTS implementation	not available
Origin of data	./.
Energy used for	Industrial process
Whole energy consumption for heating purposes before CSTS implementation	not available
Total tap water consumption	not available
Hot tap water consumption	not available
Hot tap water temperature	70–80 °C
Cold water temperature	15 °C

Engineering

AIGUASOL Enginyeria
Ignasi Gurruchaga and Daniel González
C/Roger de Llúria nº 29 3er-2a
08009 Barcelona, Spain
Phone: +34 93 342 47 55
fax: +34 93 342 47 56
infoaiguasol(at)aiguasol.coop
www.aiguasol.com

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Financing and investment

Financing of the CSTS		The total investment was 268.546 €. The CSTS has been subsidised by the Institute for Energy Diversification and Saving (IDAE) and the Catalonian Institute of Energy (ICAEN) with a total am ount of 130.000 €. (about 50%, including a tax reduction and a financing scheme with a low interest rate).
Form of financing	Purchase, 51 % self-financing	
Distribution in percentage	37.9 % subsidies 11.1 % bonus granted The 48 % left was paid with direct subsidies granted by the Institute for Energy Diversification and Saving (IDEA), the Catalonian Institute of Energy (ICAEN) and the Minitry of Industry and Mining, a tax reduction and a low interest rate.	
Costs of solar materials		
Total cost of solar system	268,546 Euro	
Detailed costs for		
Collectors	182,412 Euro	
Elevation / mounting structure	8,855 Euro	
Storage / heat exchanger	56,256 Euro	
Backup heater	./.	
Control	Included in Storage / heat exchanger	
Installation	Included in Collectors	
Planning / Engineering	11,167 Euro	
Others: Comissioning (1), General costs (2)	630 Euro (1) 9,223 Euro (2)	
Operation costs of heating system		
Other operation cost	1,250 Euro/a (operation and maintenance)	

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Development & experiences

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