

ANNEX 2

Questionnaire for the audit of an industrial process, for pre-evaluation of a large scale solar heating plants feasibility

last upgrade 21/02/06

Reference

Major parts of this questionnaire refer to:
POSHIP, short questionnaire and questionnaire v 1.01
POSHIP – potential solar heat for industrial processes
<http://www.aiguasol.com/poship.htm>

Scope

The scope of this questionnaire covers the industrial utilization of a solar thermal plant.

General information

name of the company

Town / city

branch

name of contact person

address

Telephone

Fax

E-mail

Statistical data

number of employees of the company

annual turnover

Is the company independent?

yes no

no, if more than 25% of the company are affiliated to another company

is it public?

Which percentage in the capital

Principal motivation for the use of solar energy

Possibility of saving fuel cost

yes no

Contribution to a more ecologic energy supply

yes no

Using solar energy helps for a better marketing of our products

yes no

others:

Fuel consumption	Heavy fuel oil	Natural gas	Gas Oil	LPG	OTHER:
	kg	Nm ³	kg	Kg	
Used in equipment no.: *					

*If available, give percentage used in the different equipment

Electricity consumption	Contracted power	Installed power	Consumption	"Sales to grid (co-generation)"	Tariff class
	kW	kW	kWh	kWh	

Percentage of fuel and electricity cost on overall production cost (%)

Electricity:
Fuels:

Solar System

	roof mounting	ground mounting	Notes
Available roof and ground area (m ²)			<i>Please give a short description, especially if there are different areas</i>
Inclination of the roof or ground area			
Orientation			<i>Give the orientation in degrees (SE or SW)</i>
shading problems			<i>shading by other buildings, trees. Please give a short description or sketch</i>
Distance between the roof or ground area(s) and the process (m)			<i>estimate the length of the piping from the edge of the roof or ground area to the process</i>
static load capacity of the roof(s) (kg/m ²)			<i>the additional load of a collector field is 25-30 kg/m²</i>

Were any pre-planning or planning activities of a solar system performed?

Other relevant considerations:

Process (fill for each process)

PROCESS NUMBER xx

Short description:

process medium (water, oil, air, lye ...)		the medium which is in direct contact with the treated product,
typical heat (or cold) demand (kW)		during operation
typical temperature of the process medium during operation (°C)		Please distinguish between the temperature of the process and that of the heat supply (see below).
flow rate of the process medium (m ³ /h)		only if the process medium is flowing
Quantity of process medium (m ³)		If the process medium is stored, e.g. in a tank
pressure in the process (bar)		
hours of operation per day (hrs/day)*		
days of operation per year (days/year) *		

existing Heat (or Cold-) Supply give a flow chart of the heat supply if possible

medium (water, steam, air)		medium in the heat distribution net
temperature of the heat supply (°C)		close to the process
pressure (bar)		system pressure in the heat distribution net
flow rate (m ³ /h)		flow rate in the heat distribution net close to the process
annual production of useful heat		only for the process! Please specify the unit; e.g. MWh

Heat recovery

Heat from heat-recovery available for the process ? (yes/no)		Please give a short description of the heat supply from the recovery system to the process; or why not
temperature of the heat recovery (°C)		
Storage		
Heat storage system available? (yes/no)		If yes: please give a short description. Is there a possibility to use the medium in the process as storage?
Volume of the storage (m ³)		
maximum temperature of the storage		

Are there any retrofit measure regarding the process planning or presently executed?

* if available, fill the schemes in the next page
duplicate this page for different processes

process Number xx (cont.)

Break downs due to maintenance / holidays / other breaks

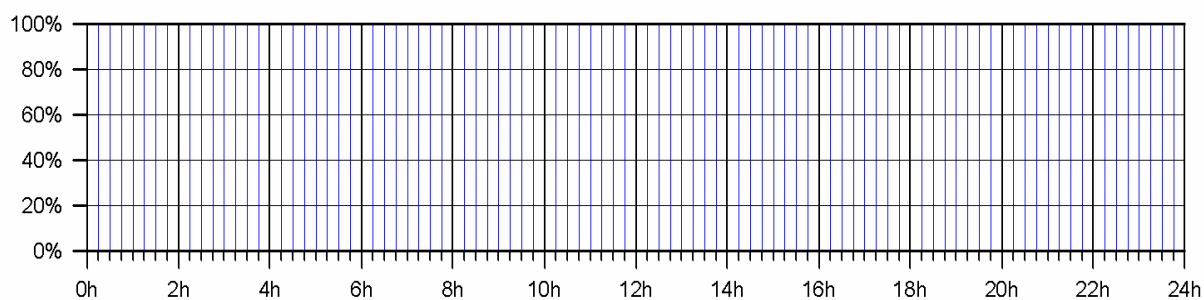
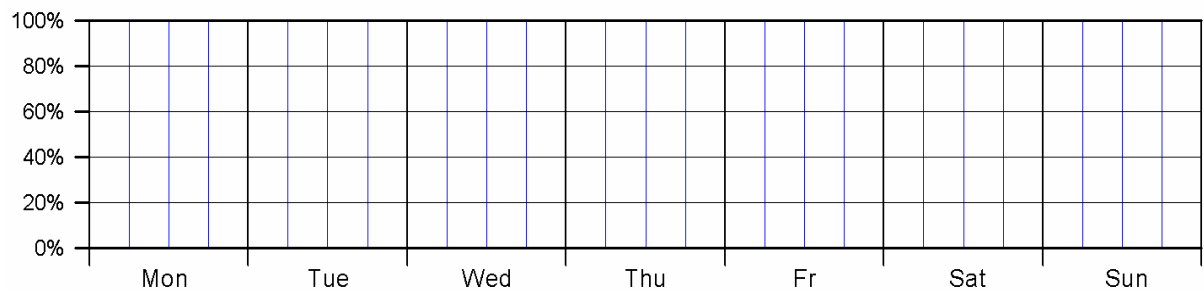
1 – from to ;
 2 – from to ;
 3 – from to ;

....

Other relevant considerations:

* if available, fill the following schemes:

typical load profile with full operation (in % of the maximum power)

of a day*of a week**duplicate this page for different processes*

Equipment for heat (or cold-) generation (fill for each equipment)**EQUIPMENT NUMBER XX****Short description:**

Manufacturer			
Year of manufacturing			
Model			
No. of units			
Fuel			
Nominal Power	kW		during operation
	kW		stand by
Fuel consumption (nominal)			
process medium			e.g. air for drying processes "nominal production"
Nominal production			specify units; e.g. "m ³ /h", "kg/h"
inlet temperature	°C		during operation
outlet temperature	°C		during operation
pressure	bar		working pressure
Mean overall conversion efficiency	%		
hours of operation per day	hrs/day		
days of operation per year	days / year		

Are there any retrofit measure regarding the equipment planning or presently executed?

Break downs due to maintenance / holidays / other breaks

1 – from to ;
 2 – from to ;
 3 – from to ;

Other relevant considerations:

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