ANNEX 3

Questionnaire for the pre-evaluation of large scale solar heating plants feasibility

Reference

Major parts of this questionnaire refer to:

'Solarthermie2000plus, www.solarthermie2000plus.de, Fragebogen zur Vorauswahl von Objekten, Solare Kombianlagen zur Trinkwassererwärmung und Raumheizung in Einzelgebäuden bzw. Gebäudegruppen', Forschungszentrum Jülich GmbH, Projektträger PTJ and ZfS - Rationelle Energietechnik GmbH, May 2005

Scope

The scope of this questionnaire covers domestic hot water systems and solar combisystems for single buildings and building groups.

Similar questionnaires for solar air conditioning systems and solar district heating system are available under www.solarthermie2000plus.de/st2kplus/index.php

Questionnaire for the pre-evaluation of large scale solar heating plants feasibility

1 Object

❑ public ❑ private

Legal status of the object owner:

……

2 Location of the object:

Name of the object: ……

Contact person: ……

Street, no.: ……

Place, postal code: ……

Telephone: ……

Fax: ……

Email ……

3 Type of building:

❑ residential building
❑ home for elderly
❑ holiday home
❑ office building
❑ other, describe
❑ students home
❑ hospital
❑ hotel
❑ workshop, industry

……

……

……

4 Occupancy of the object

	no. of occupants/beds	no. of staff
on work days (Monday to Friday)		
on Saturdays		
on Sundays and Holidays		

5 Hot water consumption

	estimated	measured
on work days (Monday to Friday)		m^3/day
on Saturdays		m^3/day
on Sundays and Holidays		m^3/day

The hot water consumption specified above refers to:

❑ the draw-off volume at the tap connection at a temperature of 40 °C

the draw-off volume at the hot water production device …

❑ … at a **planned** set temperature of the hot water device of …….. °C

❑ … at an **actual** set temperature of the hot water device of …….. °C

The hot water consumption is:

❑ approximately constant throughout the year

❑ variable, please specify:

Month	J	F	M	A	M	J	J	A	S	O	N	D	tolal
Percentage [%]													100

These values are ❑ estimated ❑ measured

Are there periods with no or strongly reduced occupancy (e.g. closure, holidays)

❑ yes, please specify ❑ no

from …… to …… reason ……..

from …… to …… reason ……..

from …… to …… reason ……..

6 Space heating load

	object section 1	object section 2	object section 3	object section 4
Name of the object / object section				
Year of construction				
Heated area [m^2]				
Useful area (acc. to the national building code) [m^2]				
Yearly heat demand [MWh] ❑ measured ❑ calculated ❑ estimated				
Design[1)] flow temperature of the heating system [°C]				
Design return temperature of the heating system [°C]				
Minimum[2)] flow temperature of the heating system [°C]				
Minimum return temperature of the heating system [°C]				
Sliding flow temperature regulation according to the outdoor ambient temperature	❑ yes ❑ no	❑ yes ❑ no	❑ yes ❑ no	❑ yes ❑ no

[1)] Design temperature (at minimum outdoor temperature) for the heating system ……..°C

[2)] Outdoor temperature for which the heating system is switched-off ……..°C

The heat load has approximately the following annual profile:

Month	J	F	M	A	M	J	J	A	S	O	N	D	tolal
Percentage [%]													100

These values are ❑ estimated ❑ calculated ❑ measured

Are there periods within the heating period with a strongly reduced heat load (e.g. closure, holidays)

❑ yes, please specify ❑ no

from …… to …… reason ……..

from …… to …… reason ……..

from …… to …… reason ……..

7 Hot water production devices

Please use the following table to describe all existing devices for domestic hot water production:

Type of device (e.g. oil, natural gas, biomass or electric boiler, natural gas or electric once-through heater, district heating, micro cogenerator, heat pump)	type of fuel	year of construction	capacity [kW]	modulation down to [kW]	condensation burner	other

8 Devices for space heating supply

❑ same devices as for hot water production

In case differing devices are used for space heating supply please specify:

Type of device (e.g. oil, natural gas, biomass or electric boiler, natural gas or electric once-through heater, district heating, micro cogenerator, heat pump)	type of fuel	year of construction	capacity [kW]	modulation down to [kW]	condensation burner	other

9 Yearly fuel consumption for space heating and domestic hot water production (incl. recirculation line)

Please specify the yearly fuel consumption. Use units corresponding to the fuel type (e.g. l for fuel oil, m^3 for natural gas)

Type of fuel	consumption for dhw peparation + recirculation	consumption for space heating	total

10 Waste heat recovery

Waste heat is available from	This waste heat is recovered		
❑ air conditioning	❑ yes	❑ partially	❑ no
❑ cooling of food	❑ yes	❑ partially	❑ no
❑ process heat	❑ yes	❑ partially	❑ no

11 Was the building and/or the HVAC equipment subject to retrofit measures

❑ yes, please specify ❑ no

Performed retrofit measures

Month/year	retrofit measure
……	……..
……	……..
……	……..
……	……..
……	……..

12 Are there any retrofit measures regarding the building and/or the HVAC equipment planned or presently executed

❑ yes, please specify ❑ no

Retrofit measures planned or presently executed

Month/year	retrofit measure	financing approved yes, for the year	no
a)……			❑
b)……			❑
c)……			❑
d)……			❑
e)……			❑
f)……			❑
g)……			❑
h)……			❑

Are the measures presented under a) to h) already in the pre-planning or planning phase or are they already presently under execution?

	pre-planning	planning	execution
a)	❑	❑	❑
b)	❑	❑	❑
c)	❑	❑	❑
d)	❑	❑	❑
e)	❑	❑	❑
f)	❑	❑	❑
g)	❑	❑	❑
h)	❑	❑	❑

13 Were any pre-planning or planning activities of a solar heating plant performed

❑ yes, please specify ❑ no

……
……
……
……
……

14 Following suitable surface areas are available and will be allocated for the solar collector field:

	surface area 1	surface area 2	surface area 3
roof / façade surface / building / denomination			
available area			..... m^2
roof inclination (0° = flat roof, 90 °= façade)			..... °
roof azimuth orientation (0 °= south, -90°=east, 90 °=west)			..... °
terrain / denomination			
available area			..... m^2
terrain inclination (0° = flat roof, 90 °= façade)			..... °
terrain azimuth orientation (0 °= south, -90°=east, 90 °=west)			..... °

In case of **roof integration** of the solar collectors into an inclined roof: The roof surface is suitable for an additional surface load of at minimum 10 kg/m^2

❑ yes ❑ no

In case of **on-roof mounting** of the solar collectors on an inclined roof: The roof surface is suitable for an additional surface load of at minimum 25 kg/m^2

❑ yes ❑ no

In case of **rack mounting** of the solar collectors on a flat roof:

The complete flat roof surface is suitable for an additional surface load of at minimum 80 kg/m^2

❑ yes ❑ no

The roof surface directly under the collector rows is suitable for an additional surface load of at minimum 200 kg/m^2

❑ yes ❑ no

For static reasons an **overspanning carrying construction** will be used for collector mounting

❑ yes ❑ no

15 When should be the installation period of the solar heating system

at the earliest: .....

at the latest: .....

why not later:

.....

.....

.....

16 Is technically qualified personnel available for operation and maintenance of the solar heating system?

❑ yes ❑ no

If yes, specify qualification: ……..

17 Site plan

Please add a site plan to this questionnaire including the following information:

- verified north direction and scale
- position, size, denomination and use of the buildings
- position of the heating central, boiler central, heat transfer units
- position of hot water and space heating lines and nets
- designated surface areas for solar collectors
- access ways and entrances to the terrain, the surface areas for solar collectors, the heating central, the building

18 Energy requirements of the building code

Was the building built in accordance to the energy requirements of the building code applicable at that time?

❑ yes ❑ no

Please add the energy performance certificate of the building if available.