



Increasing the Market Implementation of Solar Air-Conditioning Systems for Small and Medium Applications in Residential and Commercial Buildings

## Questionnaire

### National market analysis for SAC

A project funded under the Intelligent Energy Europe (EIE) programme

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## **Part A: Information on respondents**

*This part of the questionnaire is designed to identify the institutions and experts contributing to the research project. The questionnaire may be filled in by the experts or by giving interviews to the responsible contact person.*

### **1. Responsible contact person**

Organisation name:	SOLAIR partner
Contact person:	
Name:	
Address:	
Phone:	
Fax:	
E-mail :	
Internet:	

## 2. Other experts contributing information to this questionnaire

*Description of the expert who is responsible for answers given. Please indicate also which parts of the questionnaire are covered by this expert (not all interviewees need to be questioned on all parts).*

Organisation name:	
Type of organisation (e.g. industry association)	
Contact person (interviewee):	

Parts of the questionnaire answered by respondent (please tick the boxes by double click):

Part B     Part C     Part D     Part E     Part F

Organisation name:	
Type of organisation (e.g. industry association)	
Contact person (interviewee):	

Parts of the questionnaire answered by respondent (please tick the boxes by double click):

Part B     Part C     Part D     Part E     Part F

Organisation name:	
Type of organisation (e.g. industry association)	
Contact person (interviewee):	

Parts of the questionnaire answered by respondent (please tick the boxes by double click):

Part B     Part C     Part D     Part E     Part F

## **Part B: Structure of the national housing sector**

*This part of the questionnaire is designed to give an overview on the national residential sector to quantify the market potential of SAC in this sector.*

### **1. Information on the existing building stock (max 1 page)**

*Please describe with text and graphs the national building stock regarding*

- 1. the number of dwellings and its structure (apartments, single family houses, multi family houses.) within the building stock*
- 2. the year of construction of the building stock (if available: share per construction year)*
- 3. share of privately owned and rented dwellings*

## **2. Information on used heating systems in residential sector (max 1 page)**

*Please describe with texts and graphs the energy consumption and common heating systems in the national residential sector.*

*Relevant questions within this chapter are:*

- 1. What is the share between district, centralised and decentralised (each dwelling) space heating systems?*
- 2. Which are common ways of hot water supply - via central systems or decentralized (electricity, gas or other)? Please quantify the share of centralized and decentralized hot water supply systems.*
- 3. Which energy sources are used? Shares?*
- 4. Typical energy consumption and load profiles for heating (kWh/a energy consumption or m<sup>3</sup>/a fuel consumption)*
- 5. Average daily DHW consumption per occupant.*

### **3. Information on used cooling systems in residential sector (max 1 page)**

*Please describe with texts and graphs the energy consumption and common cooling systems in the national housing sector.*

*Relevant questions within this chapter are:*

- 1. What kind of systems are usually adopted in the residential sector?*
- 2. Which energy resources are used?*
- 3. Typical energy consumption and load profiles for cooling (kWh/a energy consumption or m<sup>3</sup>/a fuel consumption)*

#### **4. Information on refurbishment and new construction activities in the residential sector**

*Please indicate in figures (and/or graphs) the overall refurbishment and new construction activities in the national residential market. Eventually give comments / explanations on it with regard to SOLAIR.*

	Houses stock	Refurbishment in total	equivalent in % of existing stock	New constructions	equivalent in % of stock
<b>Year</b>					
<b>2004</b>					
<b>2005</b>					
<b>2006</b>					

Source(s) of information:

Comments / explanations:

## **5. Information on actors in the residential sector**

*What are important associations or organisations in the national residential sector? Have these actors been involved in solar thermal campaigns or programmes in the past?*

## **6. Solar cooling systems in residential sector (max 1 page)**

*Please give a brief overview on existing solar cooling systems in the residential sector.*

*Please also indicate the actual market size and peculiarities of the national **solar thermal** market in general.*

## **Part C: Information on national structure of the commercial sector**

*Like Part B. This part of the questionnaire is designed to give an overview on the national commercial sector to understand the starting point / basis for SOLAIR activities within this sector.*

### **1. Information on the existing commercial building stock (max 1 page)**

*Please describe with text and graphs the national commercial building stock regarding size and structure of commercial activities (m<sup>2</sup>). Interesting targets are mainly hotels, homes of elderly, sport centres, wine cellars, office buildings.*

## **2. Information on used heating systems in commercial sector (max 1 page)**

*Please describe with texts and graphs the energy consumption and common heating systems in the national commercial sector.*

*Relevant questions within this chapter are:*

- 1. What is the share between district, centralised and decentralised space heating systems?*
- 2. Which are common ways of hot water supply - via central systems or decentralized (electricity, gas or other)? Please quantify the share of centralized and decentralized hot water supply systems.*
- 3. Which energy sources are used?*
- 4. Typical energy consumption and load profiles for heating (kWh/a energy consumption or m<sup>3</sup>/a fuel consumption).*
- 5. Average daily hot water consumption per m<sup>2</sup> (for commercial buildings using large amounts of hot water).*

### **3. Information on used cooling systems in commercial sector**

*Please describe with texts and graphs the energy consumption and common cooling systems in the national commercial sector.*

*Relevant questions within this chapter are:*

- 1. What kind of systems are usually adopted in the commercial sector?*
- 2. Which energy resources are used?*
- 3. Typical energy consumption and load profiles for cooling (kWh/a energy consumption or m<sup>3</sup>/a fuel consumption)*

#### **4. Information on refurbishment and new construction activities**

*Please indicate in figures (and/or graphs) the overall refurbishment and new construction activities in the national commercial sector. Eventually give comments / explanations on it with regard to SOLAIR.*

	Building inventory	Refurbishments in total	equivalent in %	New constructions	equivalent in %
<b>Year</b>					
<b>2004</b>					
<b>2005</b>					
<b>2006</b>					

Source(s) of information:

*Comments / explanations:*

## **5. Information on actors in the commercial sector**

*Which are important associations or organisations in the national commercial sector? Have these associations been involved in solar thermal campaigns or programmes in the past?*

## **6. Solar cooling systems in commercial sector (max 1 page)**

*Please give a brief overview on existing solar cooling systems in the commercial sector.*

## **Part D: Information on the economic framework for SAC**

*This part of the questionnaire is needed to assess the actual impact of the policy framework in the national SAC sector.*

### **1. Energy prices**

*Please provide an overview on the development of the national energy prices in your country. If necessary, please specify the composition of prices (e.g. basic fixed rate/working rate or excl./incl. VAT etc).*

#### **Residential sector**

	<b>Unit</b>	Natural gas	Heating oil	Power	Biomass
1990	Euro/kWh				
1995	Euro/kWh				
2000	Euro/kWh				
2005	Euro/kWh				
2006	Euro/kWh				
2007	Euro/kWh				

#### **Commercial sector**

	<b>Unit</b>	Natural gas	Heating oil	Power	Biomass
1990	Euro/kWh				
1995	Euro/kWh				
2000	Euro/kWh				
2005	Euro/kWh				
2006	Euro/kWh				
2007	Euro/kWh				

*Comments / explanations:*

*In case tariffs depend on consumption, please specify the price for each consumption band.*

*If this information is not available, please refer to an average consumption according to following reference examples:*

**Residential:**

<b><i>description</i></b>	<b><i>number of inhabitants</i></b>	<b><i>yearly thermal consumption [kWh<sub>th</sub>]</i></b>	<b><i>yearly electricity consumption [kWh<sub>e</sub>]</i></b>
<b><i>single family house</i></b>	<b><i>4</i></b>	<b><i>22.000</i></b>	<b><i>3.000</i></b>

**Commercial**

<b><i>description</i></b>	<b><i>heated area [m<sup>2</sup>]</i></b>	<b><i>yearly thermal consumption [MWh<sub>th</sub>]</i></b>	<b><i>yearly electricity consumption [MWh<sub>e</sub>]</i></b>
<b><i>small commercial building (office)</i></b>	<b><i>500</i></b>	<b><i>120</i></b>	<b><i>12</i></b>
<b><i>medium commercial building (office)</i></b>	<b><i>2.000</i></b>	<b><i>500</i></b>	<b><i>50</i></b>
<b><i>medium commercial building (supermarket)</i></b>	<b><i>1.500</i></b>	<b><i>150</i></b>	<b><i>350</i></b>

## **2. National air conditioning market**

*Please provide data about the kW yearly installed and/or the number of plants **per power range***

### **3. Capital market terms in the residential and in the commercial sector (max 1 page)**

*Please indicate in figures/graphs important capital market terms for both sectors, like*

1. *Interest rates for real estate investments*
2. *Expected pay back times for refurbishment investments*
3. *Common equity rates in the residential and in the commercial sector*
4. *etc.*

#### **4. Conditions for refurbishment by residential sector (max 1 page)**

*Please describe with texts and graphs the conditions for refurbishment by residential sector by answering the questions:*

- 1. How are heating costs allocated between Tenants/Owners?*
- 2. What are the mechanisms used to shift the investment costs from the investor/owner to the users/tenants of a building?*
- 3. What are legal restrictions for rent increases?*
- 4. How are the tenants right to refuse higher rents due to refurbishment?*
- 5. Can the rent be dependant on the energy-efficiency of the flat?*
- 6. Other investment barriers due to regulations on social housing?*

## **5. National incentive systems for SAC installations in the residential and commercial sector (max 1 page)**

*Here the most important programmes on the national and regional level are identified, that are designed to promote investments in SAC installations or directly affecting the development of the SAC market.*

## **6. National incentive systems for installation of other technical solutions competing with SAC (max 1 page)**

*Here the most important programmes on the national and regional level are identified, that are designed to promote investments in installations competing with SAC.*

## **Part E: Information on national legislative framework for SAC**

*This part of the questionnaire is designed to give an overview on the relevant legislative framework for the promotion of the national SAC market and its impact on it: overall goals and strategy, as well as programmes to achieve these goals.*

### **1. Building sector regulations relevant for the SAC market**

*Here the most important legislation on the national (or regional) level is identified, that is designed to regulate the construction of new buildings and the refurbishment of existing buildings. Obviously only regulations are relevant that immediately promote or prevent the installation of SAC installations (e.g. national building codes and standards for new and/or existing buildings or Solar building obligations).*

*Important data are, for example:*

*Which energetic requirements are existing for new buildings and refurbishment?*

*Are solar ordinances active and in praxis working?*

*Are SAC systems currently included in calculations?*

*Which anti legionella regulation is available?*

*Which regulation is actually available concerning the use of surface water (for recooling of SAC appliances).*

## **2. Market conditions (max 1 page)**

*Please explain how heating and cooling costs are allocated between tenants and owners.*

*Can rent be dependent on energy efficiency of the flat?*

### **3. Certification for solar equipment**

*Please describe the current status of certification at national level: is certification for solar equipment required?*

**Specify for which components : Collectors ? Sorption machines ?**

#### **4. Financing of refurbishment activities (max 1 page)**

*Describe the mechanism used to shift the investment costs from the investor/owner to the user/tenant of a building.*

*How are investments usually financed in case of multi ownership?*

## **5. EU – EPBD (max 1 page)**

*What is the current status of EPBD implementation at national level?*

*Will solar systems profit directly from the foreseen implementation?*

## **6. Overview: national energy policy framework (max 1 page)**

*Please indicate the most relevant political goals and targets for the solar thermal and cooling sector, as well as national programs of activities for solar thermal.*

**Self evaluation of the filled-in questionnaire**

		data available	estimated data	not filled in
<b>Part B</b>	1. Information on the existing building stock			
	2. Information on used heating systems in residential sector			
	3. Information on used cooling systems in residential sector			
	4. Information on refurbishment and new construction activities in the residential sector			
	5. Information on actors in the residential sector			
	6. Solar cooling systems in residential sector			
<b>Part C</b>	1. Information on the existing commercial building stock			
	2. Information on used heating systems in commercial sector			
	3. Information on used cooling systems in commercial sector			
	4. Information on refurbishment and new construction activities			
	5. Information on actors in the commercial sector			
	6. Solar cooling systems in commercial sector			
<b>Part D</b>	1. Energy prices			
	2. National air conditioning market			
	3. Capital market terms in the residential and in the commercial sector			
	4. Conditions for refurbishment by residential sector			
	5. National incentive systems for SAC installations in the residential and commercial sector			
	6. National incentive systems for installation of other technical solutions competing with SAC			
<b>Part E</b>	1. Building sector regulations relevant for the SAC market			
	2. Market conditions			
	3. Certification for solar equipment			
	4. Financing of refurbishment activities			
	5. EU – EPBD			
	6. Overview: national energy policy framework			