



**SOLARGE**

Enlarging Solar Thermal Systems in Multi-Family-Houses,  
Hotels, Public and Social Buildings in Europe

**National market analysis  
for Enlarging Solar Thermal Systems  
in Multi-Family-Houses and Hotels in Europe**

**Germany**





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## Part A: Information on respondents

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## Part B: Information on national structure of the housing and multi family housing sector

### 1. Information on the existing building stock

From 38 million apartments in Germany, about 54 % are located in three million existing multi family buildings, 18 % in two-family houses and 28 % are single family houses.

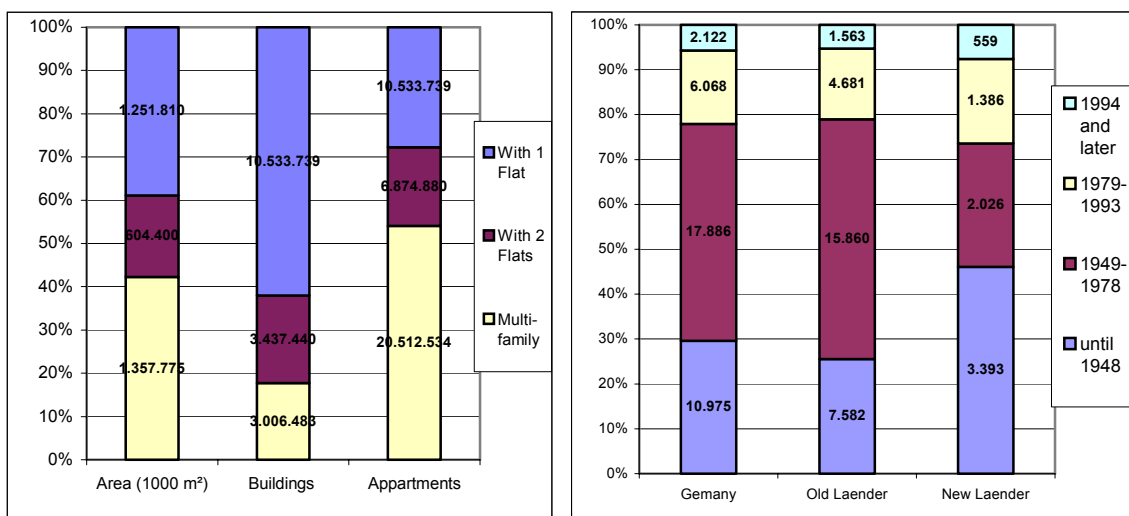


Figure 1 Building stock multi family houses (Source: destatis, 2005)

These three million multi family buildings can be divided as follows:

- 1) 3–6 dwellings, 1.82 million buildings, 7.5 million dwellings
- 2) 7–12 dwellings, 740,000 buildings, 6.6 million dwellings
- 3) >12 dwellings, 176,000 buildings, 6.4 million dwellings

It has to be mentioned, that a relevant part of buildings in category 1) and 2) are detached houses having central heating systems for several buildings. As a result of 45 years of political separation and different urban development strategies, the building stock in Germany is still differing between western and eastern German states.

With a property quota of 14 % for dwellings in multi family buildings usually rented flats are concerned. The fluctuation rate in multi family houses is at an average of 11 % per year.

The vacancy rate is differing clearly between eastern (18 %) and western states (4 %).

Especially ownership structure and the type of heating systems used are quite different.

While owners are private by the majority in the western federal states, most flats are administrated by co-operatives and municipal companies.

## 2. Information on used heating systems in multi family houses

The most common energy source for heating in Germany is natural gas. In the eastern states district heating systems and coal fired systems are quite far more common than in the old federal states, while in the western states more than 80 % of residential buildings are heated with natural gas or oil. With 14 % district heating and 69 % central heating systems, the majority of buildings provide a technically beneficial framework for integration of SCS. In a certain share of these buildings the hot water production is realised decentralised with electric boilers.

	Germany	Western states	Eastern states
Natural gas	43.3 %	44.7 %	37.1 %
Oil	34.0 %	38.5 %	14.4 %
District heating	13.1 %	8.8 %	31.8 %
Electricity	4.6 %	5.2 %	2.0 %
Coal, lignite	3.1 %	1.4 %	14.1 %
Renewable energy	1.1 %	1.2 %	0.6 %

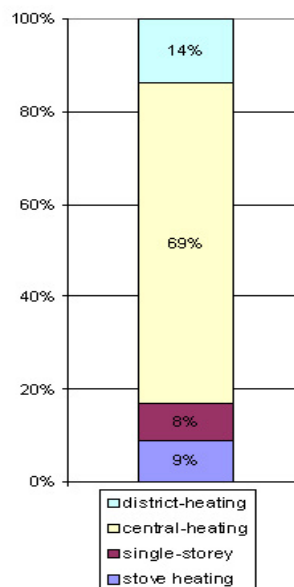
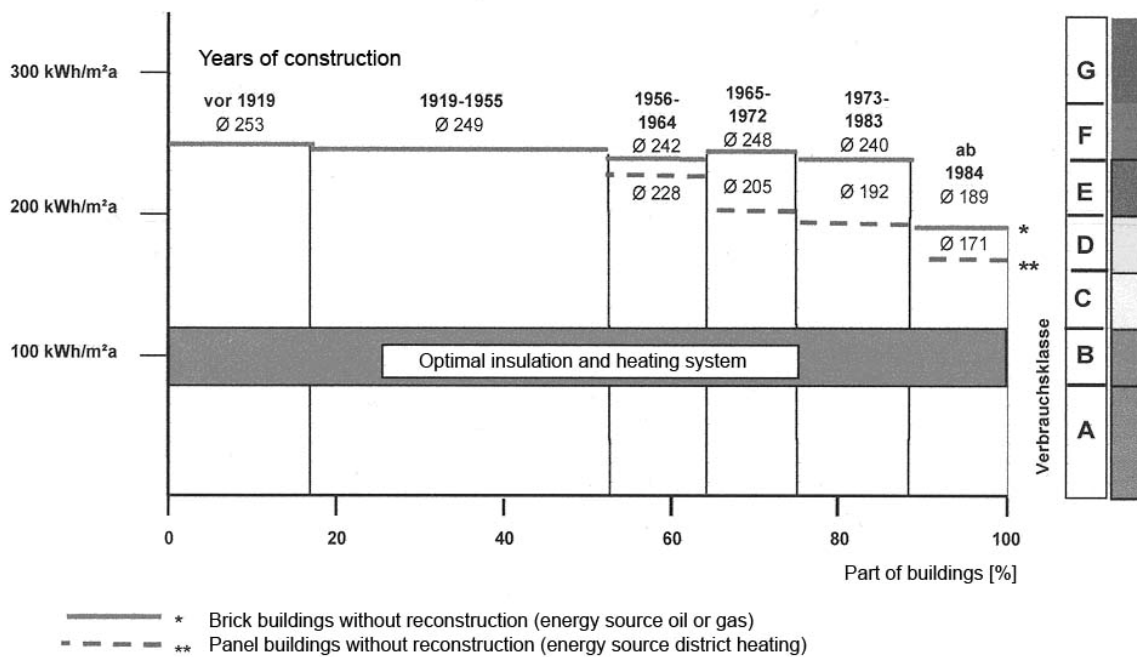


Figure 2 Heating systems of German residential buildings (Source: destatis 2005)



**Figure 2 Energy consumption of multi family buildings in Berlin (Source: IEMB e. V., 2004)**

The aging building stock is still consuming a huge amount of heating energy – most of the buildings two times more than economically optimal (as shown in figure 3 for the example Berlin).

### ***3. Information on refurbishment and new construction activities in the multi family housing sector***

	<b>Multi family houses stock</b>	<b>New constructions</b>
<b>Year</b>		
<b>2000</b>	3 million buildings 20 million dwellings	115,000
<b>2001</b>	n. a.	87,000
<b>2002</b>	n. a.	71,000
<b>2003</b>	n. a.	63,000

**Table 1 New construction activities (Source: Federal Statistical Office, 2005; LBS research, 2004)**

Refurbishments: For the majority of refurbishments no administrative procedure is necessary, therefore no representative figures for refurbishments are available.

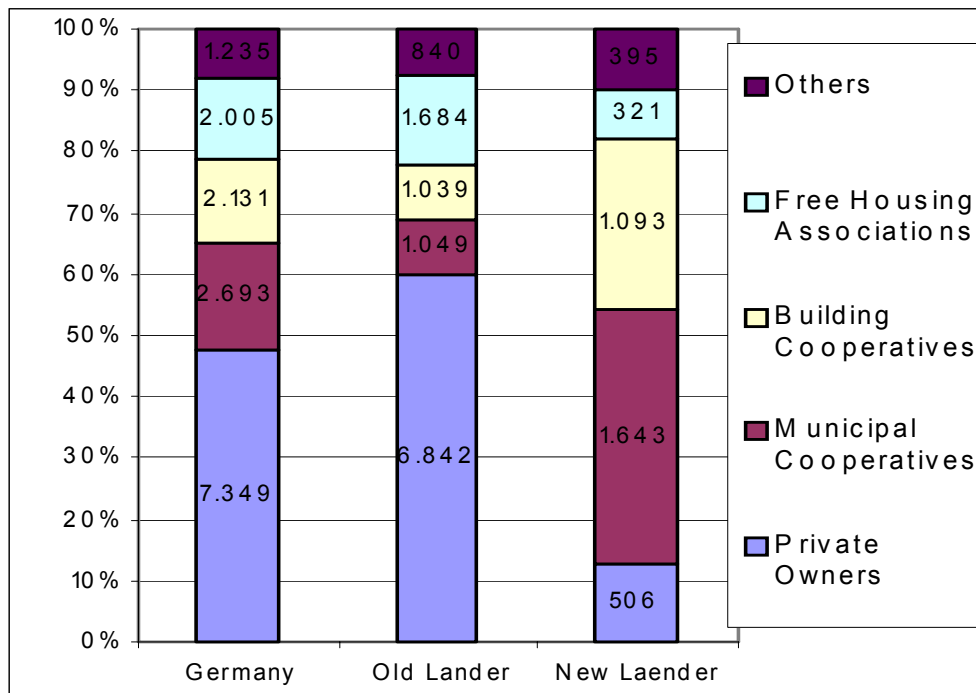
In 2003 about 92 billion € have been invested for refurbishment of residential buildings – compared to 52 billion € for new constructions the major importance of the refurbishment of buildings becomes quite evident.

#### 4. Information on actors in the housing sector

##### 4.1 Information about the ownership structure of the national housing sector

The provider of apartments can be differed in commercial providers (free housing associations), private MFH owners, communities or municipal housing companies, building private owners, which is differing between the east and the west part of Germany. In the Old Federal States about 60 % of the building stock is at private ownership, in the New Federal States only 13 %. Here the majority of the apartment stock is conducted by cooperatives (27 %) communities or municipal housing companies (40 %).

Commercial dwelling companies are lesser represented in the east than in the west of Germany, as well.



**Figure 3 Ownership structure of German housing sector**  
(Source: IEMB, 2004)



## **4.2 Important associations or organisations in the national housing sector**

The Federal Association of German Dwelling Companies (Bundesverband deutscher Wohnungs- und Immobilienunternehmen e. V. – GdW) is the biggest association company with about 3,100 member companies, which are managing a total of 6.5 million dwellings (30 % of all apartments in multi family buildings). Member companies are mainly house building cooperatives and municipal housing companies. The GdW is organised in 14 regional associations which are in more direct contact to the member companies than the national umbrella organisation. Regional activities usually have to be organised in cooperation with those regional associations, while more general information activities can be realised in cooperation with the national organisation.

The Federal Association of free Property and Dwelling Companies (Bundesverband freier Immobilien- und Wohnungsunternehmen e. V. - BFW) organizes a total of 1,840 mainly medium-sized member companies. All together they are managing a stock of 3.6 million apartments. The BFW is also organised in several regional associations cooperating under the national umbrella of the BFW.

GdW and BFW have been actively involved into the national initiative of SolTherm Europe. The cooperation will be continued within SOLARGE.

The Association “Haus & Grund Deutschland“ is organised in 22 regional associations, which confederate about 1,000 unions. The total of almost 700,000 private property owners unifies predominantly small or rather scattered property stock.

Haus & Grund was also involved into SolTherm in Germany but the widespread structure of the organisation does make various regional and local cooperations necessary – therefore an active integration into a national campaign proofs to be difficult.

## **5. Conclusion for SOLARGE**

The existing building stock of residential buildings in Germany includes a certain share of buildings suitable for the integration of CSTS, based on:

- about 3 million multi-family houses in total
- technical beneficial systems in about 80 % of these multi family houses (MFH)
- high potential for energetic optimization

Ownership structure of the German MFH-sector differs between eastern and western federal states with:

- 60 % private ownership in the western federal states
- 70 % cooperative/ municipal housing companies in the eastern federal states.

Associations of these owner groups are relevant partners for SOLARGE activities, especially for information campaigns. Overall a certain motivation for solar activity is to observe, including partnership in former solar initiatives. For actual project development activities the contact persons are responsible in the specific housing companies.

Beside the differing ownership structure, main regional differences in the market situation for rented apartments are an important framework according SOLARGE. There are:

- regions with high level of vacancy, dominated by circumstances of demand – solar activities might be a part of marketing activities, cost pressure is a relevant obstacle for most of the companies in these regions
- regions with high demand for rented apartments, dominated by the supply side, which means higher price levels and less necessity/activity for marketing.

## Part C: Information on national structure of the hotel sector

### 1. Information on the existing hotel building stock

In Germany, data from accommodation facilities with 9 or more beds are registered by the Federal Statistical Office. Please note that information about smaller accommodation facilities is not included in the following figures.

In the German hotel sector, five types of accommodation are differentiated:

**“Hotel”**: Hotel accommodating with associated restaurant(s) for hotels guests and other external guests. A hotel has to fulfil the following minimum requirements: At least 20 guest rooms, a reception for hotel guests and a substantial part of the guest rooms has to be equipped with own bath/shower and WC.

**“Hotel Garni”**: A Hotel Garni is a hotel, which offers accommodating, breakfast, beverages and only small meals.

**“Hotelpension / Pension”**: A Hotelpension / Pension offers accommodation with reduced services. Meals are served only to residents.

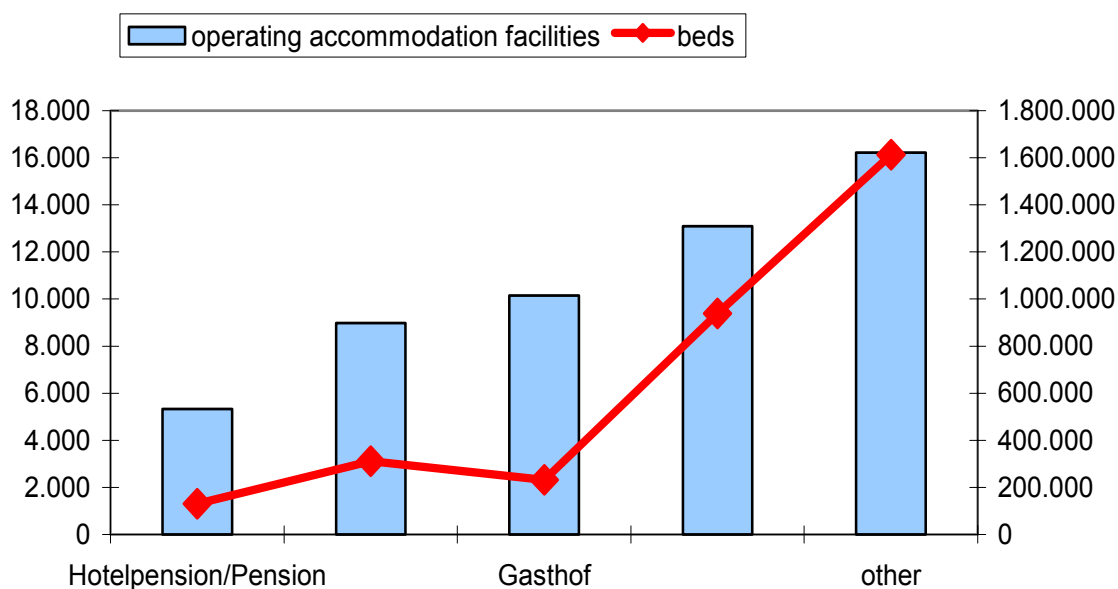
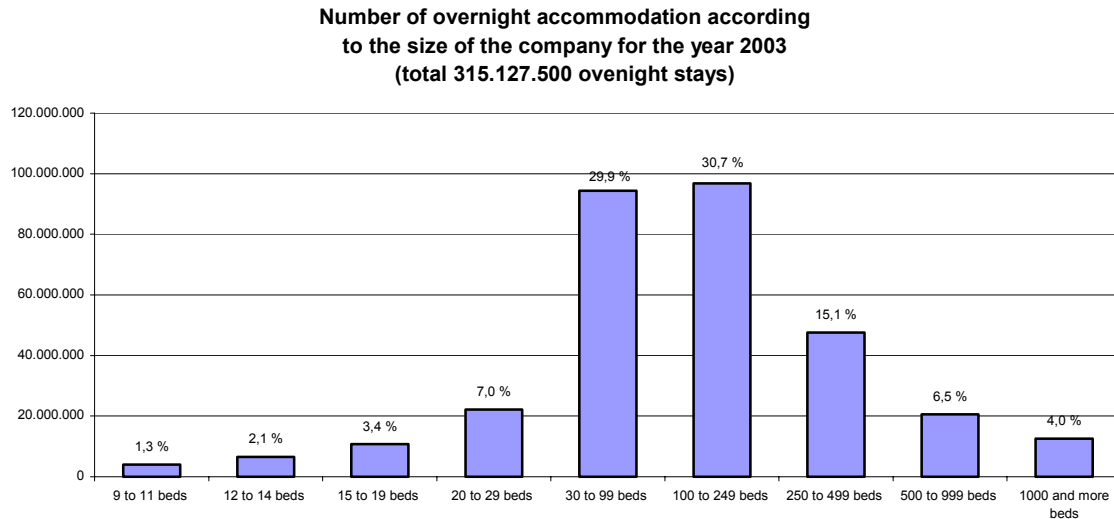


Figure 4 Operating accommodation facilities in Germany in 2003  
(Source: Federal Statistical Office, 2005)

**“Gasthof”**: A Gasthof offers restaurant and/or bar service and has some associated guest

rooms.

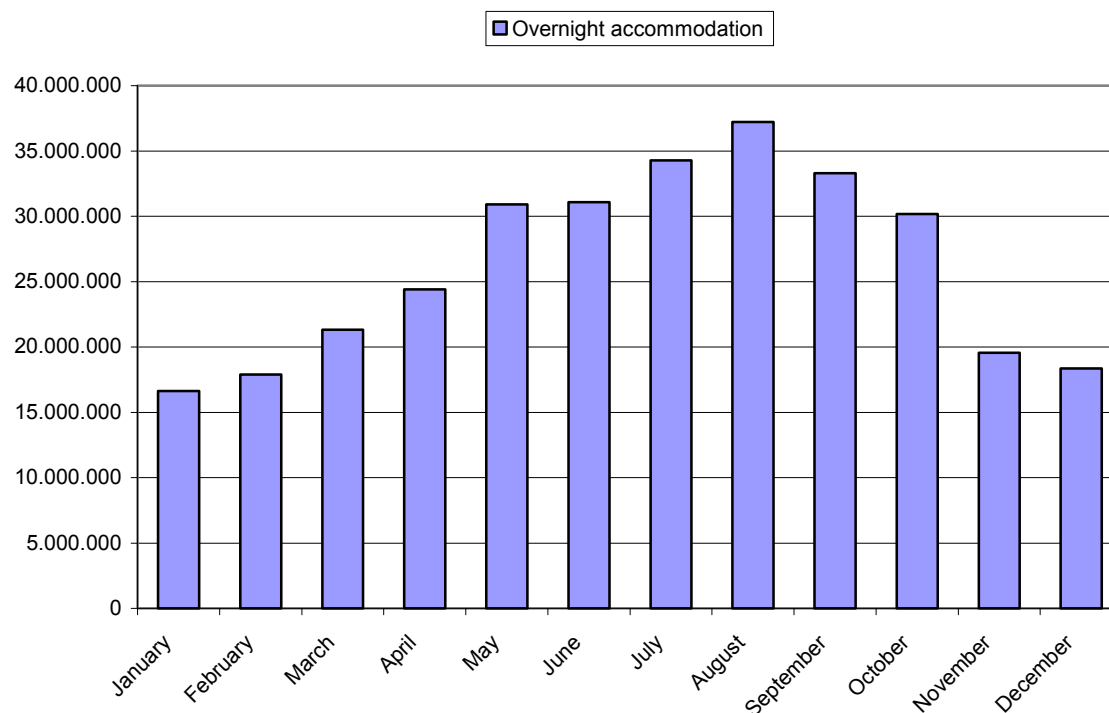
**Other:** This category merges all other types of accommodation, e. g. recreation homes, holiday homes, summer residences, cottages, youth hostels and health resorts.



**Figure 5 Distribution of overnight stays according to the size of the hotel in 2003 (Source: Federal Statistical Office, 2005)**

Altogether 53,771 accommodation facilities were operating in Germany in 2003 offering 2,515,139 beds. Meanwhile 315,127,500 overnight stays were registered in Germany’s hotel business in 2003. Roundabout 60 % of them were booked in facilities with a capacity between 30 and 249 beds.

The distribution of overnight accommodation over the course of the year 2003 shows, that there is a concentration of overnight stays in the summer months. This emphasises the usability of solar thermal energy for the hotel business especially in tourist regions.



**Figure 6** Distribution of overnight stays over the course of the year in 2003  
(Source: Federal Statistical Office, 2005)

## 2. Information on heating systems

No specific data on heating systems in hotels is available. Regarding the high requirement on comfort, a dominating share of central systems is to predict.

## 3. Information on refurbishment and new construction activities

Data on new construction and building activities in existing buildings in the hotel sector derives from statistics about building permission.

Year	Quantity	Estimated costs of the buildings
2003	490	440,991,000 €
2004	549	604,494,000 €

**Table 2** New construction (Hotels and “Gasthöfe“)  
(Source: Federal Statistical Office, 2005)

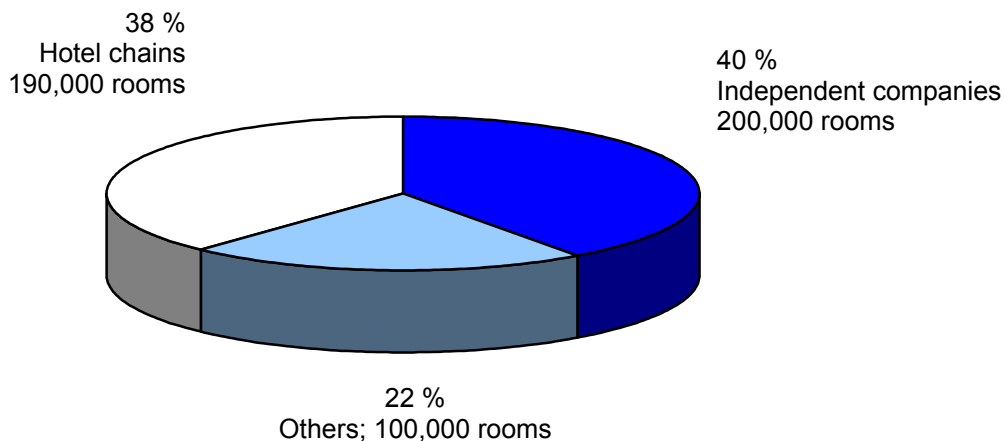
Year	Quantity	Estimated costs of the refurbishment (in 1,000 €)
2003	1,222	299,852 €
2004	1,156	243,969 €

**Table 3 Refurbishment in existing buildings (Source: Federal Statistical Office, 2005)**

#### 4. Information on actors in the hotel sector

##### 4.1 Information about the ownership structure of the hotel sector

The ownership structure of the German hotel sector is changing. Since the middle of the 90's a continuous growth of cooperation is to observe, which means an expansion of hotel chains and meanwhile a decrease of small individual companies. In 2000, German hotel rooms were allocated as shown in the picture:



**Figure 7 Distribution of hotel rooms (based on data: IHA, 2005)**

Regarding the SOLARGE project, hotel chains could be a favourable target group for activities, therefore a closer research of hotel chains owner structure authorized persons should be enclosed.

##### 4.2 Important associations or organisations in the national hotel sector

DEHOGA is the German federal association of hotels and restaurants. Most of its members are medium-sized businesses. A total of 250,000 hoteliers, restaurateurs and caterers are united in this association. The DEHOGA is composed of 17 regional associations and three trade associations – IHA (Hotels), UNIPAS (motorway service areas) and VIC (international caterers). Also DEHOGA has four specialist departments representing e. g. restaurant chains or discotheques.

The German Hotel Association (IHA) is a specialised trade association which belongs to DEHOGA. Its members are roundabout 1,000 ^hotels of the middle and upper market segment. The association represents the interests of its members vis-à-vis the policy and the public.

Both associations are situated in Berlin.

Until now, the federal associations DEHOGA and IHA have not been involved in solar thermal campaigns.

## ***5. Conclusion for SOLARGE***

With about 50,000 accommodations the hotel sector is an effective target group for SOLARGE, although detailed data about installed heating systems is still to investigate.

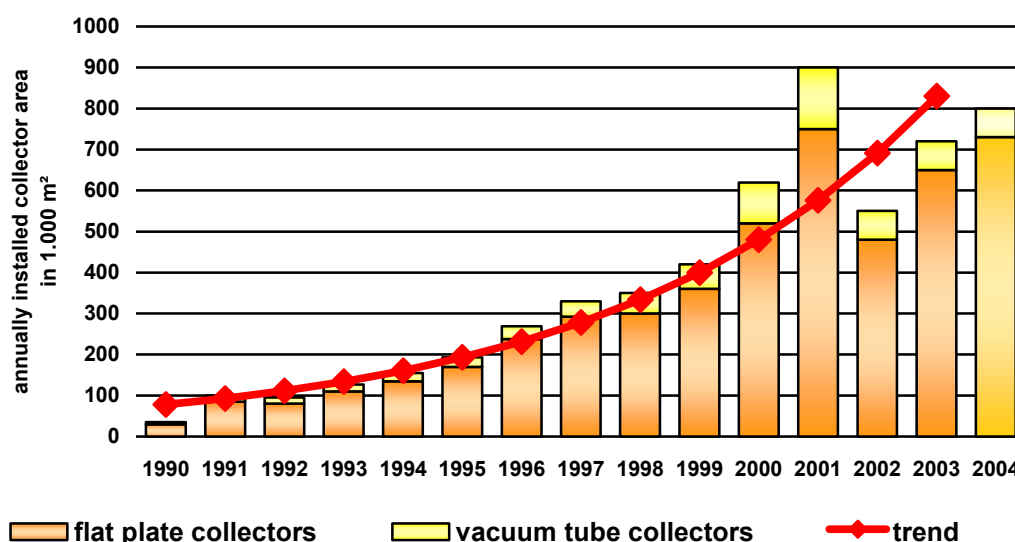
Hotel chains as a main owner of German hotels are partly listed companies with stringent demands on there business development. The financial scope for additional (e.g. solar) action is comparative low.

Interesting target group for SOLARGE are especially hotels / cooperatives, where SOLARGE could be integrated in a marketing strategy (wellness-hotels, ecotourism). The increasing tendency of these accommodations should provide positive framework for solar action.

## Part D: Information on the national CSTS market development in the past

### 1. Market background and history of solar thermal market and the CSTS segment

In Germany the solar thermal market development started in the 70's as a reaction on the oil crisis when annual growth of 30,000 m<sup>2</sup> installed collector area was to observe. After a time of stagnation in the 80's, the main boom started in 1989 and continued until 2006 with an average increase of 30 % per year. Reasons for this were the growing environmental awareness of the population and mainly the substantial subsidy programmes of the federal government, state and local authorities, who had been escorted by market campaigns in different layouts. In this context especially the market incentive programme of the Federal Republic has to be mentioned. Furthermore the system engineering had been improved concerning economy and technology, at the same time. Reasons for this were the gained experiences from previous installations on the one hand and the entrance of further market participants, especially from the heating, roofing and cladding industry, on the other hand.



**Figure 8** Installed collector area solar thermal systems  
(Source: BSi, 2005)

After the installation of collectors with a total capacity of about 625 MW in 2001, the sales in 2002 broke down at about 45 %. The reasons were due to the general economically tense



situation, the shortage of state specific support grants and the discontinuous development of the market incentive programme. In 2003 and 2004, the sales were raising gradually again up to 525 MW.

## 2. Market size, market share and market growth of CSTS

Year	m <sup>2</sup> of yearly installed collector surface in total	Market size in terms of capacity (in kWth)	m <sup>2</sup> of yearly installed collector surface in CSTS (>30 m <sup>2</sup> )	Market share of CSTS in the solar thermal market (%)	Market growth solar thermal market (%)
2002	540,000	378,000	n .a.	n .a.	n .a.
2003	720,000	504,000	n .a.	n .a.	33.33
2004	750,000	525,000	40,000	5.33	4.17
<b>Cumulated by 2004</b>	5,604,000	3,922,800	60,000–75,000	1.07–1.34	–

**Table 4 Market figures CSTS (Source: ESTIF 2005, BSI, BEA 2005)**

The average system size in 2001 was about 8 m<sup>2</sup> collector area. The predominant part of the solar thermal systems was allocated to the segment of small-sized systems. Totally 80 % of the installed solar systems are used for hot water in single or double family houses (typical size: 3 to 6 m<sup>2</sup> collector area) and about 15 % are used for combined hot water and heating systems in single or double family houses (typical size: 8 to 15 m<sup>2</sup>). Merely 5 % of the installed collector area is applied in systems, bigger or rather large-sized systems (> 20 m<sup>2</sup>) for application fields like multi family buildings, hospitals or hotels.

The data availability for the spread of solar thermal systems in the field of multifamily buildings is dissatisfying. According to the survey of the Federal Housing Association (GdW) altogether about 2,700 systems with an installed collector area of 23,000 m<sup>2</sup> exist within the member companies. In the frame of the market incentive programme and “Solarthermie2000” from 1999 until 2004 altogether 210,000 m<sup>2</sup> for systems with more than 20 m<sup>2</sup> collector area have been installed – but not only in the multi family building sector. The big solar industry companies as well, do not have any itemised figures for the rate of large systems upon their

sales. An estimation shows a dimension of 60,000 up to 75,000 m<sup>2</sup> collector area for the total German multi family buildings sector. This comes up to a share of 1.5 %–1.9 % of the total installed collector area.

### ***3. Conclusion for SOLARGE***

The German solar thermal market is developing since about 30 years, but mainly for small systems. The market sector of large-scaled CSTS is still few developed, although producers and actors show an increasing interest for its improvement.

## Part E: Information on the economic and legislative framework for CSTS

### 1. Energy prices

Natural gas price*	Unit	2002	2003	2004
Housing sector	Euro/kWh	0.042	0.043	0.045
Hotel sector**	Euro/kWh	0.035	0.037	0.039

Heating oil price*	Unit	2002	2003	2004
Housing sector	Euro/kWh	0.034	0.035	0.036
Hotel sector	Euro/kWh	n. a.	n. a.	n. a.

Power price*	Unit	2002	2003	2004
Housing sector	Euro/kWh	0.148	0.16	0.167
Hotel sector	Euro/kWh	0.086	0.095	0.10

District heating price*	Unit	2002	2003	2004
Housing sector	Euro/kWh	0.062	0.067	0.070
Hotel sector	Euro/kWh	n. a.	n. a.	n. a.

**Table 5 Energy prices (Source: Federation of energy suppliers, 2005)**

\* Prices including charges and taxes (VAT, eco-tax)

\*\* Prices for hotel sector vary with the size of the hotel – estimation

### 2. Capital market terms in the housing and in the hotel sector

Expected payback times for investments refurbishment differ between the housing sector and in the hotel sector: While the hotel sector is expecting short pay back times less than five years, housing sector is from force of circumstances used to long pay back times. Within the housing sector regional and structural differences are to observe.

General statements about equity rates are not to derive. In the housing sector the financial

situation of the companies is (depending on regional differences) increasingly critical, which means lower equity or/and liquidity. In these cases credit capital becomes more important.

Current interest rates for real estate investments are around 3.5 %.

<b>Term of loan</b>	<b>Nominal</b>	<b>Effective</b>
10 years	3.35 %	3.4 %
12 years	3.5 %	3.56 %
15 years	3.63 %	3.69 %
20 years	3.95 %	4.02 %

**Table 6 Capital market terms Germany (Source: LBS, 2005)**

It has to be pointed out, that real estate investments obtain credits with reduced interests by the Reconstruction Loan Cooperation (Kreditanstalt für Wiederaufbau – KfW).

(See chapter F 2.3)

### ***3. Conditions for refurbishment by housing sector***

The German housing sector is dominated by renting, therefore the rent law plays an important role within the scope of refurbishments.

#### **Heating costs allocation between tenants and owners**

Heating costs are paid by the tenants. The allocation of consumption based costs (in general by consumption metering and area share) is regulated in the heating cost ordinance (HeizkostenVO).

#### **Mechanisms used to shift the investment costs from the investor/owner to the users/tenants of a building**

Investments in refurbishment can be refinanced by a rent increase of up to 11 % of the total investment, if the state of a “modernization” is to apply. An energetic refurbishment with substantial energy savings (+10 %) is defined as a modernization. The possible rent increase is limited to twice of the saved energy costs. Rent comparison tables have to be considered.

The statutory regulations were gathered in one part of the German Civil Code (BGB) in 2001.

### **Investments financing in case of condominiums**

In case of condominiums investments are financed by the owners. In case of owner companionships, a decision of the condominiums owner meeting has to be adopted.

### **Legal restrictions for rent increases**

Following on a modernization, the owner has two possible ways to a rent increase:

- First: Rent increase according to customary rents of similar objects under consideration of qualified rent comparison data (“Mietspiegel”). The increase is limited up to 20 % above the customary rent of similar objects.
- Second: Allocation of the modernization costs (see above mechanisms used to shift the investment costs)

Above the statutory limits the owner can operate with voluntary agreements with the tenants (e. g. to shift the costs of the installation of a solar system)

### **Tenants right to refuse higher rents due to refurbishment**

Measures of modernization have to be endured by the tenants. The tenants have to be informed about the measures in due time and receive a special right of cancellation. The state of modernization is for example reached when substantial energy savings are realised by the intended measure.

### **Energy-efficiency as dependence factor of flat rent**

A direct factor of energy efficiency in the rent does not exist. It is common, to announce information about a “cold rent” (rent excluding heating and operation costs) and a “warm rent” (rent including heating and operation costs). Therefore an indirect information source about the general efficiency (including all additional costs) of the flat is available to a potential tenant.

### **Investment barriers due to regulations on social housing**

Energetic refurbishment measures compete with other measures of modernization as the maximum rate of rent increase is fixed. Additionally the German housing sector is (depending on regional circumstances) affected by a surplus supply of rented area. Therefore the price levels are down and modernizations (with following higher rents) may cause a worse position within the keen competition.

## ***4. Building sector regulations relevant for the CSTS market***

The Energy Saving Ordinance (EnEV) from February 2002 sets limits for the energy supply of buildings and requirements regarding the installed heating systems.

It is important to point out that the EnEV summarizes requirements on structural works and on heating systems to one integrated limit for the yearly final energy demand of a certain building. Therefore an owner can decide (by economic means) whether e. g. to invest in measures of insulation or in measure of renewable energy supply. Furthermore a special regulation about

- insulation
- duty of setup changes

is included.

Regarding the installation of solar systems especially the regulations for the existing building stock are relevant (low new building activities). Thus the limits for energy demand of new buildings may be exceeded by 40 %. The installation of a solar system is one possibility to fulfil these requirements.

Current regulations for the existing building stock just have an effect in combination with planned reorganisation measure.

Advanced impacts are to expect, when regulations of the EPBD (energy performance building directive) will be integrated into the EnEV (predicted by December 2005). With limitations of the primary energy demand the existing building stock owners will be forced to more action.

## **5. Conclusion for SOLARGE**

Based on high energy prices and the current situation of price increases – the framework for CSTS is mainly positive, according

- improvement of profitability of solar measures as a substitution of fossil energy
- awareness for SOLARGE enhanced by public discussion about energy alternatives

The regulations for refurbishment in the housing sector are benefiting solar action: solar system as a measure improving energy efficiency has to be shared by the tenants. Additional real estate investments in energy efficiency obtain favourable credits of the KfW.

Current building sector regulations, especially the upcoming obligation for an energy efficiency label for residential buildings, enable the integration of solar action within the scope of other measures on the one hand.

On the other hand, competition of solar action with other (required or possible) measures of energetic building reconstruction might cause market caution, especially for building companies in critical financial situations.

## **Part F: Information on national energy policy framework for CSTS**

### ***1. Overview: national strategy and framework for solar thermal systems and CSTS promotion***

#### **1.1. National goals and targets for solar thermal systems**

With the implementation of the Kyoto-Protocol and in the frame of the EU burden sharing, the Federal Republic of Germany agreed to reduce the emissions of greenhouse gases in the period from 2008 until 2012 compared to 1990 about 21 %. Beside the increase of energy efficiency the increasing use of renewable energies (RES) in the building sector offers huge possibilities to lower the primary energy consumption and therewith the carbon dioxide emissions arbitrate.

The current objective is a 12 % RES share by 2010 in accordance with the EU White Book. For solar thermal systems the Federal Government has also set itself the target of doubling the current amount of cumulative installed collector area to ten million m<sup>2</sup> by 2010.

#### **1.2. National strategy and programme of activities for solar thermal and CSTS promotion**

The initiative “Solar Thermal Energy for Multi Family Buildings” started in Germany in 2002, in order to promote the use of large scale solar thermal systems in the housing industry. The initiative has been part of the SolTherm Europe Initiative in the frame of the ALTERNER programme of the European Union. In ten countries, 17 European partners took part in the SolTherm Europe Initiative in order to promote the market development and the spread of solar thermal applications with different activities and target groups in the very different national markets.

#### **1.3. National administration of policy framework and support schemes**

On governmental level the Ministry of Environment is responsible for the implementation and organisation of solar initiatives including the administrative and communicative tasks of the subsidy programs:

- Solarthermie 2000+
- market incentive programme (Marktanreizprogramm)

Furthermore numerous initiatives and subsidy programmes exist on state, regional and local level. Relevant institutions are ministries of the federal states (mainly environmental departments) and local authorities.

## **2. National incentive systems for CSTS installations in the housing and hotel sector**

### **2.1. Subsidy schemes for CSTS investments**

Full name of support scheme	Solarthermie 2000+
Type of support scheme (e.g. soft loan programme)	Grant
Focus area of support scheme (e.g. installations 30-120 m <sup>2</sup> )	Large solar systems >100m <sup>2</sup>
Starting date (in place since):	02/2004
Expiry date:	
budget volume of the support scheme and sources from which it is funded	No explicit budget restriction, source federal budget
Beneficiaries of support scheme	Subsidy at an amount of 30 %–50 % of construction costs (individual conditions)
Conditions of support scheme	Pilot schemes with constant hot water supply >10%, further criteria: CO <sub>2</sub> -reduction, innovative character, minimum compensation of primary energy, accompanying research
Managing organisation (main responsible):	PTJ Projektträger Jülich
Contact person (programme manager):	Mr. Donat
Address:	Wallstraße. 17–22, D-10179 Berlin
eMail:	p.donat@fz-juelich.de
Internet (incl. downloads):	www.fz-juelich.de



Full name of support scheme	Market incentive programme – MAP
Type of support scheme (e.g. soft loan programme)	Grant
Focus area of support scheme (e.g. installations 30-120 m <sup>2</sup> )	No limitation
Starting date (in place since):	31.12.2003
Expiry date:	15.10.2006
budget volume of the support scheme and sources from which it is funded	No explicit budget restriction, source federal budget
Beneficiaries of support scheme	Subsidy at the amount of: 105 €/ installed m <sup>2</sup> (60 €/installed m <sup>2</sup> for collector area >200m <sup>2</sup> )
Conditions of support scheme	
Managing organisation (main responsible):	Bundesamt für Wirtschaft und Ausfuhrkontrolle
Contact person (programme manager):	Gerhard Schallenberg
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## 2.2 Fiscal incentives for CSTS investments

There are no fiscal incentives for CSTS investments in Germany.

## 2.3 Other incentives

The Reconstruction Loan Cooperation (Kreditanstalt für Wiederaufbau – KfW) offers soft loans for building reconstruction (including installation of solar systems) within the scope of KfW CO<sub>2</sub> Building Rehabilitation Programme. Up to 100 % of the investment costs including ancillary costs (architect, advice on how to save energy, etc.), representing up to a maximum

of EUR 250 can be granted.

**Loan term**

As a general rule, the maximum loan term is 20 years with at least one and no more than three redemption-free grace years. A loan term of up to 30 years with at least one and no more than five redemption-free grace years may be applied for as well.

**Interest**

The interest rate is considerably below the capital market level and is fixed by KfW Förderbank for the first ten years upon commitment of the loan. At the end of the ten year period the interest rate is reset.

**3. Conclusion for SOLARGE**

Different subsidies for CSTS investments are available in Germany.

The amount of aid money available per solar system might produce effective impulses, but a sufficient financing of solar systems is not provided.

## Sources

### **Part B: Information on national structure of the housing and multi family housing sector**

#### **1. Information on the existing building stock**

- Federal Statistical Office / destatis 2005

#### **2. Information on used heating systems in multi family houses**

- Federal Statistical Office / destatis 2005
- GdW statistics 2004

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

- Federal Statistical Office / destatis 2005
- LBS research 2004

#### **4. Information on actors in the housing sector**

- BFW statistics 2005

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

#### **1. Information on the existing hotel building stock**

- Federal Statistical Office / destatis 2005

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

- Federal Statistical Office / destatis 2005

### **Part D: Information on the national CSTS market development in the past**

#### **1. Market background and history**

- BSi 2005
- BAFA 2002 - 2005

#### **2. Market size, market share and market growth of CSTS**

- BSi

**Part E Information on the economic and legislative framework for CSTS****1. Energy prices**

- Federation of Energy Suppliers 2005

**2. Capital market terms in the housing and in the hotel sector**

- LBS research 2005



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