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## German CSTS Policy Advice Report Handed Over to Ministry

The German market for solar thermal systems is well-known for its strong and continuous growth. At present more than 900,000 systems with a collector area of approx. 9 million square metres are installed on German roofs. But this positive situation is not valid for larger solar thermal systems. A Policy Advice Report on status and possible improvements for the CSTS market has now been submitted by SOLARGE partners in Germany to the German Environmental Ministry. Here are some of the conclusions.

### Status and potential of the market for large systems

The analysis of statistical data showed that only 1 % of all solar thermal systems in Germany have a collector area larger than 30 square metres. But technical feasibility is not the key barrier, states the Policy Advice Report. Numerous positive examples of large-scale solar thermal applications are well documented in fields as diverse as multi-family houses, district heating, car washes, laundries, bakeries or industrial cooling. And the technically feasible potential for CSTS in Germany is huge: 50 % of the gross energy consumption for heat is found in the

temperature and building segment relevant for CSTS. If energy efficiency measures are used consistently, solar thermal energy could – theoretically – supply 25 % to an overall reduced energy consumption.

### Motivation and barriers of investors

In Germany, there is a broad variety of potential investors for CSTS. Private house owners and amateur landlords as well as residential building cooperatives are less profit-oriented than professional housing companies. A key barrier in this field is the “investor-occupant-dilemma” (see figure 1):

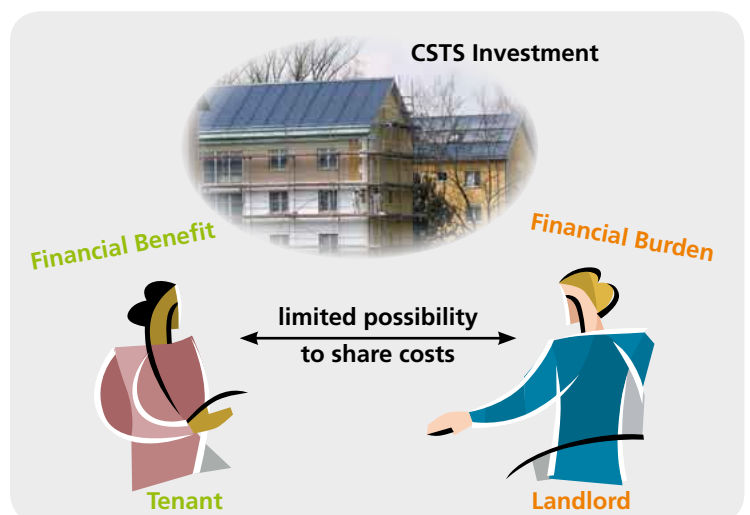


Figure 1:  
Investor-Occupant-  
Dilemma

The investor has to pay for the entire investment, but only the tenants benefit from the reduced energy bills. Disadvantages such as the initially high investments, difficulty of sharing costs, long amortisation periods and insecure yields seem to weigh more than benefits such as reducing energy bills, subsidies or betterment of real estate. All in all, there is a major demand for information and activation of investor groups, because possibilities and advantages of CSTS are mostly underestimated or completely unheard-of.

### Subsidy schemes

Generally, grants are the most common subsidy for CSTS throughout Europe and are also currently offered via the Market Incentive Programme (MAP) in Germany. The budget foreseen for 2007 amounts to 175 million Euros and applications are handled according to "first come, first served" policy. The Policy Advice Report conducted an analysis of other support models such as tax reductions, low interest loans, certificate trading or building obligations, many of which have been applied successfully in other countries such as France, Italy or Spain. The report concluded that the grant scheme in operation in Germany is suitable in principle, but needs comparably high administrative effort and depends too much on allocations at national level. The report proposes a "bonus model" that could

overcome these disadvantages and which up until now would be unprecedented in Europe. This "bonus model" would be comparable to the German Act on Granting Priority to Renewable Energy Sources, which is in operation since 2000 and has led to a considerable boost of renewable electricity. The key idea is to grant a reimbursement for every kilowatt hour produced by a renewable heating system. Since the money for this could also come from additional charges on energy prices, the "bonus model" would offer more continuity and security of funding. However, quite a few stakeholders and experts prefer a "solar buildings obligation" to this "bonus model".

### Technological development and quality assurance

As can be said for most European solar markets, the experience with and development of standardised products for smaller solar thermal applications has reached a sophisticated level in Germany. Unfortunately, this does not apply for systems with collector areas larger than 30 square metres. Despite of sufficient experience with larger systems in various applications, there is still a great need for standardisation, integrated concepts, and preassembled kits with operating surveillance technology as well as methods for guaranteed output. The Policy Advice Report identified research demand in the fields of stagnation, monitoring, standardisation and optimisation of interfaces with conventional heating. Today, about nine companies develop and offer systems and components on the market for CSTS in Germany. Generally, manufacturers of solar thermal systems produce components such as collectors or storage tanks and offer additional preassembled kits. But on the whole, ready-to-use systems are not yet a standard as in the regular trade with smaller solar thermal systems.

### Technological Problems with CSTS

Area	Frequent problems	Possible solutions
Planning	Determination of demand is often neglected and systems are then oversized	Detailed identification of long term regular and off-peak demand
Hydraulics	The lack of accurate hydraulics leads to low or irregular circulation, pressure drops, bad ventilation or vaporisation	Manufacturers guidelines as well as simple and sound systems standards
Adjustment control	Wrongly positioned temperature sensors or disadvantageous control strategies or parameters cause disappointing outputs or even increase energy consumption	Effective performance needs carefully adjusted and customised control concepts, that fit the overall CSTS
Installation	Deficiencies in the insulation of piping, connections and fittings as well as in weather protection and positioning of sensors	Quality assurance and one-to-one implementation of concept
Putting into operation	Lack of rinsing, wrongly adjusted volume flows, disadvantageous parameters, and wrong reactions to stagnation cause serious problems	The optimal adjustment can only be done after close monitoring of a first operation phase

Table 1: Overview according to Policy Advice Report

*Applications such as this 70 sqm of collector area on a nursing home are still rare in Germany*

**The Policy Advice Report urges for action in four fields**

The detailed Policy Advice Report set out to investigate the status quo, barriers, potentials and perspectives of the market for CSTS in Germany and concluded with a set of recommendations in the following four strategic areas to systematically develop the market segment:

**1. Improving the policy frame conditions**

Especially the bottleneck of the investor-occupant-dilemma could be overcome in two ways: Improving the possibilities for property owners to share the costs of a solar investment with tenants. However, the amount of energy saving should be higher than the investment in order to make CSTS economically attractive. A second option would be to improve subsidies for those investors not willing or eligible to share investment costs. Finally, more innovative policy such as a "bonus model" or a "solar buildings obligation" would be substantially effective.

**2. Launching a target group-specific promotional campaign**

A promotional campaign addressing specific target groups should be launched in order to overcome the awareness and information lacks. The highest potential could be seen in the multi-family housing with three to twelve flats and hotel and industry sector. Here the needs and concerns that are to be addressed should be differentiated between professional, amateur or commercial landlords.

**3. Proactive capacity building of installers and planners**

It seems very essential that the existing know-how on CSTS has to be made accessible for installers and planners proactively. Therefore a key requirement of capacity building is efficient exchange, activation and involvement of stakeholders. This could include improved promotion for training measures, setup of centres of excellence and developing specific information tools and forums.



**4. Further developing and standardising the technology**

Efforts should be undertaken to increase the standard and application possibilities of the CSTS technology. Measures recommended include defining and agreeing on standards, reducing the diversity of existing concepts, increasing quality of monitoring or operating surveillance technology as well as general quality assurance.

The Policy Advice Report was handed over to the German Environmental Ministry in June 2007. There are plans to launch a call for tenders for projects and activities that address the recommendations and issues raised by the CSTS experts as soon as possible. On the whole, the discussions of the report as well as the openness to take action prove that the situation of the CSTS market in Germany draws more and more the attention at policy level it deserves.

**For a copy of the Policy Advice Report in German please contact Frederik Moch from the Bundesverband Solarwirtschaft at [moch@bsw-solar.de](mailto:moch@bsw-solar.de).**

## Lack of Exchange: Survey on CSTS Qualification of Installers in Germany

A thorough survey on the skills of installers of solar thermal systems in Germany has been conducted by SOLARGE partner target GmbH end of 2006 in preparation for the Policy Advice Report. The results of the interviews with experts as well as from an online questionnaire of 53 installing companies delivered some good insights into the training needs and situation for solar thermal systems larger than 30 square metres.

The survey showed that the issue of solar thermal technologies is nowadays an integral part of the curriculum of the regular installer education and vocational training in Germany. Interested professionals can choose from more than 100 seminars or training courses on solar thermal technologies. However, the issue of larger systems and the specific requirements for installation and planning are not yet established elements of these trainings. At present, there are only seven trainings offered in Germany, which specifically cover large solar thermal systems. The interviewed experts explained that in-

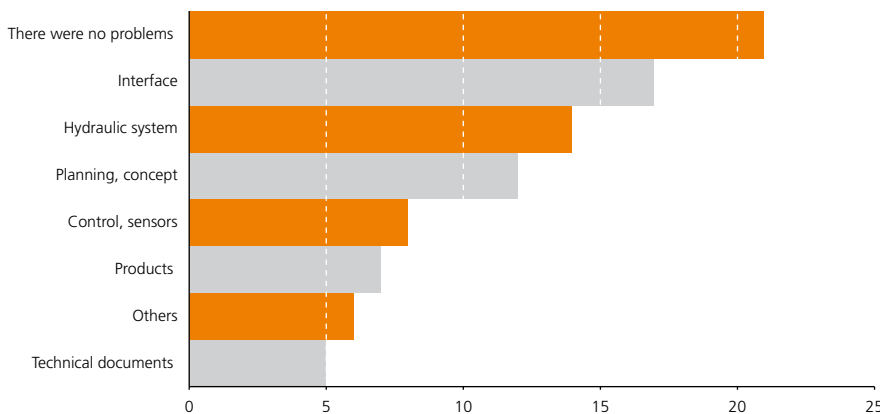


house trainings by manufacturers are often preferred by installers. Normally they are for free and often only take one day, even if thorough and longer product independent trainings would be more adequate.

On the whole, the solar thermal training landscape in Germany is considered to be good in scope and quality. The major problem is seen in the fact that installers and planners are not sufficiently interested and willing to participate in seminars. This is something the interviewed experts see as a vicious circle: The demand for large-scale solar thermal systems is still too marginal to exert pressure on the supply side regarding qualification measures.

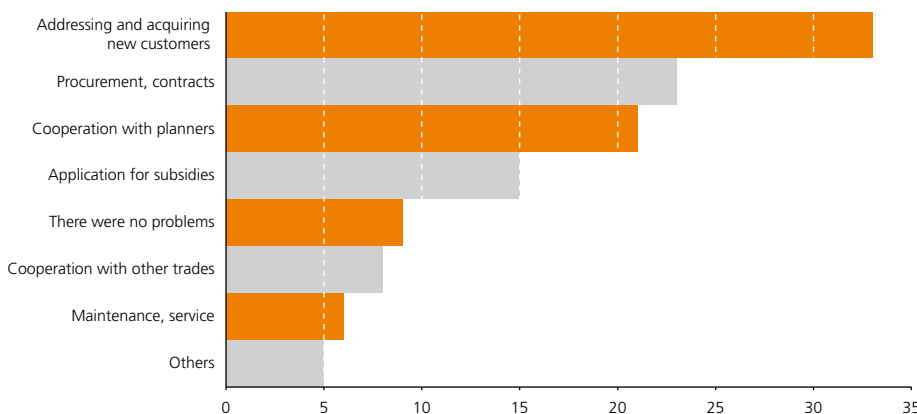
Not surprisingly, installers that participated in the online polling came from small to medium sized companies. A third of the installing companies are very small with no more than five members of staff. 70 % of the companies are only active at regional level. Even though only 53 installers filled in the questionnaires, they represent a considerable share of the solar thermal market in Germany. In total, the installers questioned stated to have installed some 230,000 solar thermal systems with a total of 2.3 million square metres of collector area. This accounts for roughly a fourth of the total of installed solar thermal systems in Germany. 66 % of these installers have experience with solar thermal systems larger than 20 square metres. Even though the group of CSTS inexperienced installers is quite high, the installers questioned do not see themselves as lacking practical and theoretical knowledge regarding the installation of CSTS. This self-confident attitude can also be seen in the answers relating to possible technological or non-technological prob-

### „In which area did you face technological problems when installing CSTS in the past?“



Source: target GmbH 2007, Installer Survey, n = 53

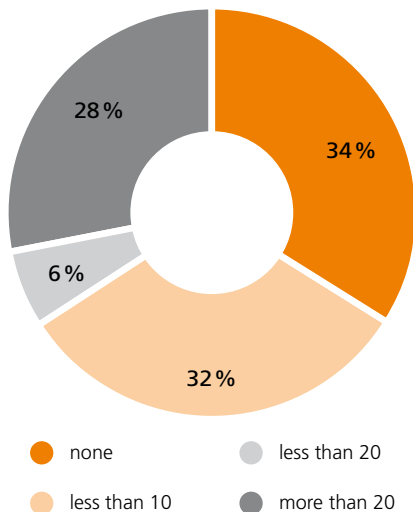
### „In which area did you face non-technological problems when installing CSTS in the past?“



Source: target GmbH 2007, Installer Survey, n = 53

lems. A large majority assures that they had "no problems" on the technological side in the past and that the key non-technological problem faced is addressing and acquiring new customers.

**„How many solar thermal systems with collector areas larger than 20 sqm has your company installed so far?“**



Source: target GmbH 2007, Installer Survey, n = 53

If asked, what kind of support the installers would want to increase the market diffusion of CSTS, the open exchange and discussion with peers or experts is the most welcomed measure. In general, results of the polling show that installers prefer "situational" to "structural" support. They want quick, easy and direct help in a situation where a problem occurs and do not want to invest much time in training and qualification beforehand. Installers see a wide array of measures that could help to improve their situation, such as more and improved support from manufacturers and planners, open exchange with peers, more cooperation amongst the different professionals involved, improved components and materials as well as marketing. It is quite significant that the installers do not consider the lack of qualification to be a major obstacle. Or, to put it otherwise: The survey in Germany showed that especially measures improving cooperation, exchange and marketing are essential to boost the market for CSTS – the lack of training options as such seems not to be the major bottleneck.

**If you want to find out more or want to have a copy of the German survey, please contact [elle@targetgmbh.de](mailto:elle@targetgmbh.de).**

## Combining Social with Solar Commitment: The Italian Installing Cooperative RESEDA

The cooperative RESEDA was founded in 1999 with the idea to merge social and ecological commitment. Over the years it has not only been active in the field of training of disabled persons and education for children, but also developed a substantial business installing small and also large-scale solar thermal systems. It is officially registered as a non-profit organisation and started its regular installing activity in 2001 after two years of training experience. Today, the cooperative located in Genzano, just south of Rome, has eight employees, four of them are disabled.

Until now it has installed four large solar thermal systems between 60 and 260 square metres of collector area. The present business with CSTS makes up some 10 % turnover of the overall solar thermal segment. But four more projects with collector areas between 100 and 300 square metres are currently underway. One of the planned projects is being conducted in cooperation with the University of Rome and is a solar thermal system for hot water with a collector array size of 300 square meters on a prison building. And as is characteristic of RESEDA, the combination of social and environmental responsibility is integral part of this project. The installation will be assisted by detainees, who have undergone a specific training course. The other two planned projects are more interesting under the technical point of view, since they will deliver heat for industrial processes and for cooling purpose for a galvanic factory (200 square metres of collector area) and for an agricultural factory (150 square metres of collector area).

But installations are not the only activity of RESEDA. A lot of importance is also given to offering training, especially for people with special needs. Participants are given the opportunity to make practical experience, either in the laboratory, the depository or at the construction site. It is RESEDA's strong belief that training in renewable energy technologies will offer new employment opportunities for otherwise disadvantaged persons. But since the business with large solar thermal systems is still in a seed phase, RESEDA is also committed to capacity building. The installation of pilot plants is accompanied with intense monitoring and research

as well as continuous internal training and exchange with relevant research institutions. "But often, it is not the technology itself, that makes installation of CSTS so difficult," explains Andrea Rostagnol, vice-president of RESEDA, "it is usually the biggest challenge to convince the potential investors about the technological and economic feasibility. A further problem we face repeatedly: The size of the collectors. Especially in factories with high specific energy consumption, there is often simply not enough space on the roof for a large collector". But in the opinion of Rostagnol, large commercial and residential applications nevertheless present a promising segment, "CSTS have reached a good cost-benefit ratio that cannot be ignored, they are technologically interesting and fit 100 % into our specific knowledge and philosophy". It is RESEDA's strong belief that the solar thermal market will increase drastically and that CSTS will gain more weight in the near future. RESEDA is working on increasing the quality of solar thermal systems, both products and installation, and building up capacities to offer complete services, including energy audits, plant design, installation as well as after sales service. "The demand for CSTS will step-up and we are prepared", concludes Rostagnol.

**To find out more about RESEDA, visit [www.resedaweb.org](http://www.resedaweb.org).**



Student models of solar systems built in one of RESEDA's educational seminars.

## France: Guidelines and Pilot Training Underway

The French SOLARGE partners are currently finalising a set of important tools and materials. This includes a training course for engineers as well as two guidebooks for installing and designing companies. The first pilot training is planned for October to test the concept of the training. The CSTS training will then officially start at the beginning of 2008. The two guidebooks have been financed by ADEME in association with Electricité de France and Gaz de France and contain a lot of CSTS expertise. The first guidebook will deal with CSTS in general and will be available after the summer break, the second guidebook focuses on specific CSTS with individual storages and will be finalised in October.



Les Glycines, Cagnes-sur-Mer, France, 47 kW<sub>th</sub> (72 sqm)

## Germany: Training in Hannover

Training organised by SOLARGE partner target GmbH for installers of large-scale solar thermal systems was successfully carried out on 14<sup>th</sup> and 15<sup>th</sup> of June in Hannover. Even though the group of participants was comparably small, the intense discussions and learning atmosphere made the training a success for capacity building in the region.

## Promotion in Berlin "Gas + Solar XXL"

The German SOLARGE partner Berliner Energieagentur launched a promotional campaign for housing companies in Berlin on the 27<sup>th</sup> of June. The campaign is being implemented in cooperation with the local natural gas supplier GASAG and offers information on CSTS, feasibility studies for building owners and extra subsidies as well as assessments of buildings by so called "solar agents". More information can be found at [www.berliner-e-agentur.de](http://www.berliner-e-agentur.de).

## Seminars for Residential Building Cooperatives

Seminars for decision makers and planners from housing cooperatives are planned from autumn 2007 onwards. About 2,000 residential building cooperatives in Germany were informed about seminars for their planners along with the dissemination of the CSTS image brochures end of June. These seminars are aimed at CSTS capacity building in project development and assessment units. Contents of these seminars are currently under development.

## Italy: SOLARGE Trainings

So far, two trainings on technology and application of large-scale solar thermal systems have been carried out in Italy in 2007. The first training took place in Rome on 1<sup>st</sup> and 2<sup>nd</sup> of February as part of the local CSTS promotion campaign by the Province of Rome. The second training took place from 19<sup>th</sup> to 21<sup>st</sup> of April within the frame of the SOLAREXPO 2007 in Verona.

## New Survey Shows Market to be Underestimated

A new survey by the Solarexpo Research Centre on the Italian solar thermal market shows that about 130 MW<sub>th</sub> (186,000 m<sup>2</sup>) new solar thermal capacity was installed during 2006. This makes Italy the fifth largest solar thermal market in Europe. This figure shows that the size of the Italian market had been vastly underestimated during the last few years. And the trend is even more promising: Manufacturers foresee a market growth of about 50 % for 2007 due to the recent favourable legislation and subsidies.



Albergo Cepino, Valdisotto, Italy, 23 kW<sub>th</sub> (36 sqm)

## New Law Will Boost RES

The new Italian law 311 has definitely introduced the European Energy Performance of Buildings Directive (EPBD) into the Italian legislation and will also boost the use of renewable energy sources. The energy certification of buildings will be adopted gradually and from 2009 onwards, every building will need energy certification. The law is also very relevant for the use of solar thermal energy. Every new building is obliged to cover at least 50 % of heating demand by RES. Since it is the most cost effective, the use of solar thermal energy will therefore receive a further push.

## Netherlands: Solar Thermal Roadmap

With support of the SOLARGE partner Ecofys, the Dutch solar industry federation Holland Solar published a Solar Thermal Roadmap in March 2007 describing a clear vision and strategy for a market transition for more solar thermal systems in the Netherlands. The roadmap aims to reverse the suboptimal market trend by proposing coherent points of action for government, business community and institutions of knowledge. **An English summary of the roadmap can be found at <http://horus.buronetwerk.nl/~hollandsolar/zonnewarmte>**



## Activation of Social Housing Associations

The Dutch SOLARGE partner Ecofys organised a “sustainability” workshop on the 24<sup>th</sup> of April specifically for members of the national social housing federation Aedes for promoting large-scale solar thermal systems. The topic and workshop was also presented in an article in the April issue of the Aedes-Magazine. Aedes has some 500 members managing more than 2.4 million households. The workshop was followed by an excursion to large solar thermal installations in June.

## Slovenia: Solar Thermal Technology Platform Launched

On 24<sup>th</sup> of May 2007, a Slovenian Solar Thermal Technology Platform (SSTTP) was officially launched with a foundation conference in Godovič. A draft of a Slovenian “Solar Vision” and a strategic research agenda were discussed by 37 delegates from the most important public, industrial and research institutions. The SSTTP is an important step for implementing the national goals for increasing the share of renewables and includes exchange on and activation for CSTS.

## SOLARGE Publication

400 copies of the “Market Report for Enlarging Solar Thermal Systems in Multi-Family Houses and Hotels in Europe” have been published now by SOLARGE partner University of Ljubljana in a Slovenian language translation. It will be used in awareness raising activities and disseminated widely to public authorities, decision makers and industry. **The publication can also be downloaded from [www.solarge.org/index.php?id=151](http://www.solarge.org/index.php?id=151).**

## Spain: High Demand for CSTS Training

Since the application of solar thermal systems is obligatory (Spanish building code CTE) for new buildings and major renovation projects in Spain, the issue receives lot of attention and demand for training is currently very high. SOLARGE partner Ecofys S.L. already organised three major CSTS training workshops for important property developers with more than 120 participants. The workshops addressed all relevant issues, from solar energy basics to real applications and estimating the global dimension of systems.

*Bachflat, Tilburg, Netherlands, 250 kW<sub>th</sub> (354 sqm)*

## Solar Industry Conference 2007 in Madrid

Following the successful model of the Solarpraxis Forum, the Solar Industry Conference is now being established as a business meeting-point for Spain's solar industry. The conference will take place on 24<sup>th</sup> and 25<sup>th</sup> of October in Madrid and will offer market stakeholders exchange with representatives from the worlds of politics, finance, and the media. SOLARGE partner Ronald Voskens from Ecofys S.L. will be a speaker at the conference and the workshop on "The Risk of Not Ensuring Installation Quality" will also discuss best practices and common problems of CSTS. **For more information, please visit [www.solarpraxis.de/index.php?id=1047](http://www.solarpraxis.de/index.php?id=1047).**

## Project Activities and Deliverables

### Now Available: SOLARGE FAQ Leaflet

Are large solar thermal systems technically mature? And how much do they cost and where do I find qualified installers? Perhaps you also have been asked these questions over and over again. SOLARGE partner Berliner Energieagentur developed a comprehensive leaflet on the ten most frequently asked questions concerning large solar thermal systems in German and the leaflet has already been translated into Slovenian and Spanish. The publication is meant to give potential investors quick, but adequate answers to the most burning questions in the area of technology, cost effectiveness and implementation. References and recommendations are also included to help those wishing for more detailed information. The leaflets can be downloaded from [www.solarge.org](http://www.solarge.org).



### Magic 7: SOLARGE Image Brochure in Seven Language Editions

One of SOLARGE's ambitious tasks was developing a high-quality image brochure on CSTS in all national languages of the project partners. The first lot of brochures with sixteen pages on background, experiences and advantages of CSTS are now available in English, German, Dutch and Slovenian. The second lot in Italian, Spanish and Danish are being finalised. All SOLARGE partners will disseminate the brochure widely to housing companies and other potential investors, including other marketing and activating instruments such as special trainings, information events or consultations.



## 3<sup>rd</sup> European Solar Thermal Energy Conference in Freiburg, Germany

The European Solar Thermal Energy Conference estec2007 was the most important event of 2007 for the solar thermal sector worldwide. estec2007 presented information about solar thermal markets worldwide, as well as policy, industrial and technological developments. In addition to this, the European Solar Thermal Technology Platform, ESTTP, discussed its latest findings. **For more, visit [www.estec2003.org/2007/index.asp](http://www.estec2003.org/2007/index.asp).**

## SOLARGE Meeting and Intersolar in Freiburg, Germany



*SOLARGE partners discussing the next project activities at the Freiburg meeting*

For SOLARGE partners, Freiburg was certainly the place to be from 19<sup>th</sup> of June onwards. The estec2007 conference was followed by the Intersolar, Europe's largest and most acclaimed international trade fair for solar technology, from 21<sup>st</sup> to 23<sup>rd</sup> of June. Since many SOLARGE partners were present in Freiburg, the 5<sup>th</sup> SOLARGE project meeting was arranged on the 21<sup>st</sup> of June.

## Project Consortium

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**Berliner Energieagentur GmbH**

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**Bundesverband Solarwirtschaft e. V. (BSW)**

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**Ambiente Italia srl**

[www.ambienteitalia.it/solare.htm](http://www.ambienteitalia.it/solare.htm)

The Netherlands

**Ecofys Netherlands BV**

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