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NEGST

New Generation of Solar Thermal Systems

Instrument: Coordination Action (CA)

Thematic Priority: PRIORITY 6-1: Sustainable energy systems
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Periodic Activity Report

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SUMMARY

The project aims mainly at the development and market introduction of the next generation of solar thermal systems. This "new" system generation represents a further development of today's system technology with respect to improvement of performance and reduction of system costs. In addition to solar thermal systems for domestic hot water (DHW) preparation, solar combisystems (systems for combined DHW preparation and space heating) are considered, as well as systems for solar cooling and sea water desalination.

The main instrument of the project is the creation of a network for the co-ordination of the research and innovation activities for the development of the new generation of solar thermal systems. This is done in close cooperation with industry. The aim is to give industry useful support in the development of a new generation of solar thermal systems to achieve the common goal of a wider market penetration of solar thermal energy in Europe.

Furthermore accompanying measures supporting the market introduction of a new generation of solar thermal systems for domestic hot water preparation and / or space heating form one important element of the project. These measures are focused on the promotion of standardised system concepts, the integration of solar thermal systems into building technology, methods for rating, standardisation and testing of the next generation of systems, as well as forming a platform for the work on advanced applications such as solar cooling and desalination.

The project started on July 1st, 2004 and has a duration of 36 months. The project work is divided into 6 different work packages. The interdependencies of these key components related to the 6 working packages are shown in figure 1 and are described in the following:

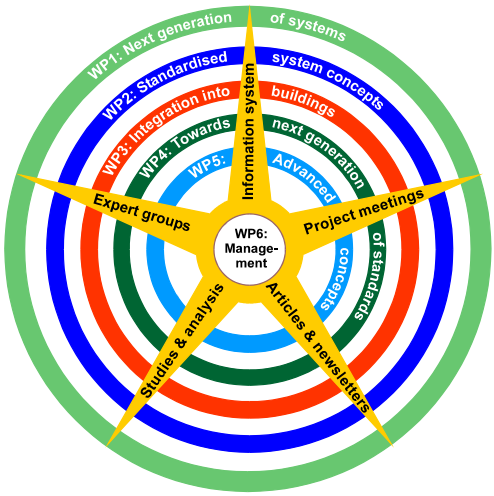

Figure 1: Project Structure of NEGST

Work package 1 aims at the development of a new generation of solar thermal systems and their introduction to the market, whereas work package 2 deals with standardised system concepts for larger solar thermal systems i.e. hot water supply for multifamily houses and other buildings with a large hot water demand. Furthermore large combisystems will be considered.

Work package 3 concerns the integration of solar thermal systems in buildings and the dissemination of efficient methods and innovative ways of integrating solar thermal with focus on the architectural and aesthetic points of view in new and existing buildings.

Work package 4 has the objective to complete preliminary normative work for a next generation of solar thermal systems and components. These new standards are needed to help new and better products - which are not covered by the existing standards - to penetrate the market as soon as possible.

Work package 5 concentrates on advanced applications like technologies of seawater desalination and cooling systems powered by solar thermal energy at low to medium temperatures.

Work package 6 comprises mainly project management, the co-ordination of the whole project in order to achieve the contractual obligations and expected results and the dissemination of project results.

The consortium consists of leading solar thermal experts from research and test institutes as well as industry participants from several European countries. The following contractors are involved in the project:

- **Austria:** Arbeitsgemeinschaft Erneuerbare Energie (AEE INTEC) Institute for Sustainable Technologies
  (Leader WP 3 – Integration into buildings)
- **Austria:** Österreichisches Forschungs- und Prüfzentrum Arsenal Ges.m.b.H. (ARSENAL research),
  (Leader WP 2 – Standardised system concepts)
- **Belgium:** European Solar Thermal Industry Federation a.i.s.b.l. (ESTIF),
  (Leader WP 4 – Towards the next generation of standards)
- **Denmark:** Technical University of Denmark, Department of Civil Engineering **(**BYG.DTU**)**
- **Denmark:** Jan Erik Nielsen, SolarKey Int., as subcontractor of ESTIF
- **France:** Centre Scientifique et Technique du Bâtiment (CSTB)
- **Germany:** Kassel University (UNI KASSEL)
- **Germany:** University of Stuttgart, Institut für Thermodynamik und Wärmetechnik (ITW), (Leader WP 6 – Project Management)
- **Germany:** Solar- und Wärmetechnik Stuttgart (SWT) as subcontractor of ITW
- **Greece:** National Center for Scientific Research (NCSR “DEMOKRITOS”)
- **Italy:** Ente per le Nuove tecnologie, l'Energia e l'Ambiente (ENEA), (Leader WP 5 – Advanced applications)
- **Italy:** Politecnico di Milano (POLIMI)
- **Netherlands:** Ecofys b.v. **(**Ecofys**)**
- **Netherlands:** Netherlands Organisation for Applied Scientific Research (TNO)
- **Norway:** Department of Physics, University of Oslo **(**UIO**)**
- **Portugal:** Instituto Nacional de Engenharia e Tecnologia Industrial (INETI)
- **Spain:** Instituto Nacional de Técnica Aeroespacial (INTA)
- **Sweden:** Högskolan Dalarna (SERC)
- **Sweden:** SP Swedish National Testing and Research Institute
- **Switzerland:** Hochschule für Technik, Rapperswill (SPF-HSR)
  (Leader WP 1 – Next generation of systems)

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Further information can be obtained from the project website:
www.swt-technologie.de/html/negst.html

The project logo is shown on the front page of this report. It symbolically shows the increasing market and the improvements made in the field of solar thermal expressed by a rising arrow. The sun as the central energy source is shining on the arrow. Furthermore the arrow is based on the letters of the NEGST project symbolising the impact of the project on the solar thermal technology.

Work performed

A detailed market survey with evaluation of market situation, state of the art and market requirements has been worked out. The market survey on today's system technology identifies differences in technology which are relevant in the different countries today and which may be important tomorrow. Besides it gives an overview on different market requirements, shows the distribution of solar domestic hot water and combisystems, indicates the share of installed collector area in single and multifamily houses, and includes the space heating and domestic hot water demand in the individual countries.

For a better understanding of the reasons for the current low dissemination of large solar thermal systems for the hot water and heat supply in large buildings, several surveys were carried out. Technical representatives and representatives of the building industry were addressed with a questionnaire on the general chances and barriers for large solar thermal systems. The result is a country specific overview of the experiences and major barriers for the implementation of large solar thermal systems. Special marketing materials as well as financing methods were examined for their dissemination throughout Europe. Forming a basis for the further efforts on system standardisation, good practise large solar thermal systems were allocated and documented.

An inventory of existing requirements and directives regarding integration of solar thermal collectors into the building envelope in EU countries has been compiled concerning topics like strength of construction (wind/snow), avoidance of fire risk, noise problems, construction damage, air leakages/thermal bridges, environmentally problematical materials, rain and moisture penetration, water tightness and maintenance of the roof. This inventory includes more than 150 regulations, guidelines and national standards concerning building integration from Austria, France, Germany, The Netherlands, Norway, Portugal and Sweden.

New standards for a next generation of solar thermal systems are needed to help new and better products, which are not covered by the existing standards, to penetrate the market as soon as possible. One of the results of the pre-normative work is the "conversion from m^2 to W_{th}". Traditionally solar thermal installations have been accounted in square meters of collector area, a unit not comparable with other energy sources counting their capacity in kW.

Possibilities and chances of advanced applications like seawater desalination or solar cooling have been evaluated. A detailed investigation was carried out that resulted in a technical status report with the following issues: a brief description of the technologies under investigation, an assessment of the global energy requirements, costs, the main advantages and drawbacks in particular in view of the coupling with solar thermal systems, the development status and their possible commercial diffusion.

Expected results

As the overall objective of this project is to introduce more cost-effective solar thermal systems, particularly for domestic hot water preparation and / or space heating and cooling, to the market, the general expectation is to provide the basis for that process. In order to do this, the technology of promising system concepts will be collected and evaluated. Furthermore collected experiences will be used to compile design and installation guidelines for the new system generation and will be made available for industry.

With regard to standardisation it is important not to block promising technologies by standards and regulations. In order to treat the standardisation aspects in an appropriate way, activities leading to the next generation of standards form a major part in this project. In addition, aspects related to the integration of solar thermal technology in the building envelope are intensively treated in order to provide nice examples of already existing projects and to deliver recommendations of concepts for easy installation and integration in conventional heating appliances.
In order to pave the way for advanced applications such as solar cooling and seawater desalination these technologies are also considered.

One major aspect of the whole project is to transfer the specific know how to the target groups. Therefore workshops with industry participants are being arranged in order to discuss the results and to derive general recommendations for future system development.
Finally, recommendations are given as to what has to be done to overcome barriers for the market introduction of innovative products.

Results achieved so far

Now, at mid-term of the project duration, already a considerable amount of results has been achieved and a large number of deliverables is already available. A list of deliverables is given in the Annex (Plan for using and disseminating the knowledge) and the deliverables themselves are attached to this report as an appendix.

In order to form a basis for the development of a new generation of systems the current status of today's system technology was investigated in 12 different European countries and the results are described in a "Summary report on today's system technology" (Deliverable WP1.D1). Meanwhile the systems were grouped in system classes with similarities and the most promising system types of these classes with the highest impact on the market have been identified. Out of this 9 most promising system concepts have been selected and evaluated. The essence of these evaluations is described in a "Report about theoretical system evaluation" (Deliverable WP1.D2). In order to ensure the proper design and installation of the new generation of systems "Design and installation guidelines for the new system generation" are described in Deliverable WP1.D4 that is available in a draft version.
In the next step the selected system types will be further evaluated on site. Finally the systems will be presented with regard to efficiency, ecological and installation aspects as well as costs.

As a starting point for the development of standardised system concepts, a "Survey on barriers and chances of large solar thermal systems" was carried out addressing technical representatives and representatives of the building industry. The results are described in deliverable WP2.D1. Taking into account the economically tough environment for large solar thermal systems, innovative financing methods were investigated and described in the report "Investigation of methods supporting and assuring the investment in large solar heating systems" (Deliverable WP2.D3). Being the tool to actually address the decision makers on the

investors side, a database of marketing material was built up, which is laid down in Deliverable WP2.D4 named “Material for marketing SDHW systems to investors in the building industry”.

The integration of solar thermal into the building envelope is in many countries intensively regulated and restricted by standards, norms, directives etc. In many cases this fact can lead to considerable problems, since most solar thermal systems are somehow integrated in a building. Hence it is quite important to be aware of these requirements when designing the new generation of solar thermal systems. In order to provide this information to manufacturers and system designers an inventory of guidelines was compiled in 7 European countries including an overview of about 160 existing requirements in EU countries and directives. The results of these investigations are described in the deliverable WP3.D1_2. One major cost aspect is related to the installation and integration of the system into the building. In order to provide a basis for a further cost reduction, “recommendation of concepts for easy installation and integration in conventional heating appliances” are given (deliverable WP3.D5).

With regard to pre-normative work for the next generation of standards for the next system generation several meetings were held with industry and the need for future standards was discussed. The results of these activities are described in deliverable WP4.D1 named “Meeting minutes and status reports of subtask meeting as a basis for the co-ordinators project reports”.
During these meetings it was decided to focus work on the following areas: advanced collectors, advanced stores, advanced controllers, combisystems, solar cooling, solar desalination, fluids, LCA (Life Cycle Assessment), dissemination strategies.
Furthermore it was agreed on a list of documents and procedures to be produced.

Concerning advanced applications such as solar cooling and sea water desalination the current status of these technologies was described in a “Technical status report on solar desalination and solar cooling” that is available as deliverable WP5.D1. Since the general aim is to drive these technologies by means of solar thermal energy, a “report concerning the suitability of different collector technologies for solar cooling and solar desalination” was written (deliverable WP5.D2). One major intention of this report is to provide a guideline for solar thermal industry and system designers to create highly efficient and cost effective systems for advanced applications.

Intentions for use and impact

One central aspect of this project is to pave the way for the development of a new generation of solar thermal systems. It is obvious that the target area for the results elaborated within this project is at first the solar thermal industry. Furthermore technicians and architects being directly and actively involved in the solar thermal business are considered as target groups.
Resulting from this, the major intention is to provide the relevant information to these target groups. This is done by target group specific workshops and seminars. In the first 18 months of the project duration about 20 seminars or workshops were held and in total approximately 1700 people attended these events.

In addition to these events, allowing a direct bidirectional communication the information about the existence of the project was spread by a press release translated in 7 different European languages and by two project newsletters. The major aspect of these measures is to make the target groups aware of the project and to motivate them to contact the project internet site for further information.

The impact of the project is quite difficult to assess. However, while the project has already passed half of the duration it can be observed that in the solar thermal industry there is a growing mood toward the development of new and innovative systems. It can be expected that this trend will continue and most likely be intensified when the mid-term results of this project will find their way to industry. In order to draw the attention of the industry and the other target groups to the project results it is intended to prepare a third project newsletter for distribution at the Intersolar trade fair taking place at Freiburg, Germany in June 2006. The dissemination of the mid-term project results will be performed by means of the deliverables compiled in the appendix of these reports. The relevant deliverables will be available for download from the project web site free of charge.

SECTION 1:
PROJECT OBJECTIVES AND MAJOR ACHIEVEMENTS DURING THE REPORTING PERIOD

In this section a general overview on the project objectives will be given and the work performed during the reporting period will be described. This description is relatively brief, since the individual results of the specific actions carried out within this project are described in detail in the individual deliverables being part of this report as an appendix. The most important deliverables are designed as a kind of stand alone report and do also provide information about the contractors involved in the preparation.
At the end of this section the current project status is assessed.

The overall objective of the project is to introduce more cost-effective solar thermal systems, particularly for domestic hot water preparation and / or space heating, to the market in order to contribute to the European Union's Action Plans with regard to the reduction of CO_2 – emissions and the cost effective supply of renewable energies. In order to achieve this goal, the project provides a framework for the development of the next generation of solar thermal systems and their introduction to the market.

This “new” system generation represents a further development of today’s system technology with respect to improvement of performance and reduction of system costs. In addition to solar thermal systems for domestic hot water (DHW) preparation, solar combisystems (systems for combined DHW preparation and space heating) are considered, as well as systems for solar cooling and sea water desalination.

The first step to achieve the project goal was the determination of the state of the art of European system and building integration technology. Therefore an extensive market analysis was carried out in each work package:

- In WP1 a detailed survey of today’s system technology concerning solar domestic hot water systems and solar combisystems was made, that results in an extensive survey report (Deliverable WP1.D1).
- In WP2 questionnaires have been elaborated concerning solar thermal systems with large collector areas (> 50 m²). Theses questionnaires were distributed among experts in order to gain knowledge on barriers of a wider distribution of large solar thermal systems. The results have been evaluated (Deliverable WP2.D1). In addition a survey on existing financing methods for solar thermal systems in the different European countries has been achieved (Deliverable WP2.D3).
- In WP3 an overview of existing requirements and directives regarding the integration of solar thermal collectors into the building envelope in EU countries has been elaborated in order to find out gaps in knowledge (Deliverable WP3.D2).
- In WP4 pre-normative work for the next generation of standards has been carried out.
- In WP5 a technical status report on solar desalination and solar cooling has been worked out (Deliverable WP5.D1).

Nearly all participating institutions have contributed to the individual work packages so that the results comprise all of the European countries involved in the project.

The next step that was carried out during the first reporting period was the identification and evaluation of promising system concepts which can act as a basis for a new system generation. Nine promising system types were selected and a theoretical system evaluation was carried out. This system evaluation shows the advantages of the promising system types in comparison with a current state of the art reference system (Deliverable WP1.D2).

Overall a good basis for further work has been accomplished during the first reporting period. The next steps that already have been started will focus on standardisation of system concepts, standardisation activities and several recommendations for easy installation and integration of solar thermal systems.

Knowledge transfer by workshops, conferences, magazine articles related to project objectives and results has already successfully been started and will be intensified in the second project period.

Concerning the management of the consortium it can be stated that in general the project is proceeding according to the original schedule. With regard to the timing the only major deviation is that the preparation of the mid-term reports (due time month 18) was delayed by two months. This was mainly due to the intention to use the third project meeting scheduled for month 20 for a further discussion of the deliverables supplied with the mid-term report. On the overall timing of the project this is completely uncritical since the total formal duration of the project as foreseen in the contract is 36 months, but the project was originally designed for an effective duration of 30 months. Now the consortium decided to extend the effective project duration by two months to 32 months.

The fact that part of the work load related to the preparation of the mid-term report and especially to the deliverables in the appendix was not performed within the first reporting period from July 1st, 2004 to December 31st, 2005 resulted in the fact, that instead of the originally foreseen 66 % only 57 % of the overall total eligible costs for the whole project did occur during the first reporting period.

In summary it can be stated that the project proceeds in general as planned.

SECTION 2:
WORKPACKAGE PROGRESS OF THE PERIOD

In this section the overview of the actions carried out in the first reporting period is presented on work package (WP) level basis. The work performed and the contractors involved are described. The progress towards the achievement of the objectives is presented. If significant deviations from the work program exist, they are mentioned and the source is identified as well as actions towards the achievement of the original planning are described. Furthermore lists of deliverables and milestones are included.

WP1: Next generation of systems

Responsible Lead contractor of WP1:
Participant No. 2: Hochschule für Technik, Rapperswil (SPF-HSR)

To develop a new generation of solar systems – the overall objective of work package 1 (WP1) was carried out. A questionnaire was prepared, agreed upon and filled in by all contractors participating in WP1. The survey revealed as key items, relevant for the achievement of the objective: large differences in the state of the solar thermal system technology used in the various countries; fields of improvement and focus for the development of a new generation of systems and new systems and system concepts under development as well as market and development trends. The results of the survey were summarized in a summary report on today's system technology (WP1.D1).
Subsequently, according to the plan, promising system concepts have been identified (WP1.M1) and a selection of systems (WP1.M2) was evaluated theoretically. It had been planned to evaluate 5 system concepts. Finally nine systems have been evaluated theoretically. Thereby, the experience of selected industry-partners, leading in their field, has been included in the criteria catalogue for system concept evaluation. Even though completion of the survey report (WP1.D1) and theoretical evaluation, reported in WP1.D2 have taken more time and effort, than anticipated, the process and progress in WP1 was not held up or even endangered. Because of the very significant differences in solar system technology revealed by the survey, this report not only helped the project participants to identify possible tracks to follow in order to define and develop a new generation of system concepts, but, in addition to the original objective, the survey also yields valuable information for technical and commercial stakeholders in the solar thermal industry, and even policy makers.
The intermediate results reported in the system technology report ("survey", WP1.D1) where communicated to the industry participants in NEGST project meetings and to representatives of the solar thermal industry, who are not directly involved in the project, in specific industry workshops (WP1.D3) Rapperswil, Switzerland, 2 June 2005 and Salzburg, Austria, 2.12.2005. At least one more specific workshop is planned to take place in Sweden in the second reporting period.
Based on the work completed, it has been defined which systems may undergo further practical examination (WP1.M3).
The promising system concepts identified and the systems evaluated represent a variety which replies to the possible development tracks and requirements of different applications climates and markets. System-specific design and installation guidelines will have to be tailored to the specific new system concepts. General design and installation guidelines (WP1.D4) were drafted but will be finalized in parallel with the practical examination for which reason this

document shall be completed and delivered in the second reporting period thus suffer a delay with respect to the original plan. As this document focuses on general recommendations for future system development, the completeness and quality of the document can be improved if more experiences are included, without having any implication of the progress of the project itself.

List of Deliverables (1st Reporting Period) - Work package 1

Del. no.	Deliverable name	Work-package no.	Date due	Actual/ Forecast delivery date	Estimated indicative person-months	Used indicative person-months	Lead contractor
WP1.D1	Summary report on today's system technology	1	6	9/2005	5.0	8.5	2
WP1.D2	Report about theoretical system evaluation	1	12	3/2006	5.0	6.5	2
WP1.D3	Workshop with manufacturers	1	18	3/2006	2.8	3.5	2
WP1.D4	Design and installation guidelines for the new system generation	1	18	9/2006	7.0	4.8	2

List of Milestones (1st Reporting Period) - Work package 1

Milestone no.	Milestone name	Workpackage no.	Date due	Actual/Forecast delivery date	Lead contractor
WP1.M1	Identification of five promising system types	1	6	4/2005	2
WP1.M2	Selection of systems to be further evaluated	1	12	4/2005	2
WP1.M3	Selection of systems used for on-site evaluation	1	12	3/2006	2

WP2: Standardised system concepts

Responsible Lead contractor of WP2:
Participant No. 3: Österreichisches Forschungs- und Prüfzentrum Arsenal Ges.m.b.H. (ARSENAL research),

WP2 deals with large solar thermal systems with a collector surface larger than 50 m². The goal of this work package is to identify barriers that hinder the dissemination of larger solar thermal systems in multifamily houses and other buildings with a large hot water demand and to find possible solutions to overcome these. Paying attention on the numerous factors of influence that are responsible for that enhanced dissemination, the original work plan foresees a broad range of issues to be subject of the 4 subtasks. For achieving remarkable results in the

addressed issues, according to the general orientation of NEGST, the focus hereby was decided to be put on the rather technological issues.

Chronologically executed first, subtask 1 was dedicated to a survey amongst the 2 stakeholder groups “building industry” and “planners and installers” on the major barriers for the dissemination of large solar thermal systems in the participating WP2 countries. For this reason, two questionnaires for the separate stakeholder groups were prepared and disseminated to an addressed audience of more than 250 experts in 8 countries. Utilizing the information of 25 % responding stakeholders, single country evaluations as well an overall European evaluation was elaborated leading to the delivery of WP2.D1.
Subtask 1 significantly exceeded the foreseen time frame, mostly on behalf of the responsible partner arsenal research. This is due to the demanding design and evaluation of the very ambitioned questionnaire with more then 15 addressed issues and the intermediate dismissal of the person in charge of the evaluation, leading to enhanced work effort. After all, the work on subtask one resulted in a report of 60 pages and the collected contacts from there on served well as database for the following evaluations of other WP2 issues.

Concerning WP2.D2, which represents workshops that according to the original work plan were planned to be carried out during the first reporting period until month 18, the time frame was changed. As the stakeholders on large solar thermal systems proved to be hard to accept, WP2 partners agreed to put the focus rather on the possibilities than on the problems of large solar thermal systems when addressing them. As a matter of fact, the achieved results during the first 18 month of the project as well as allocated best practise examples are furthermore supposed to be subject of the rather motivating workshops being organised in the second project period. The outlined work in the first reporting period on this issue is a result of the partitioning of the overall management efforts on WP2 to the separate work packages.

Subtask 3 is dedicated to financial issues and the marketing of large solar thermal systems. According to a template prepared by arsenal research, WP2 partners reported about the application and best practise examples of third party financing of solar thermal systems as well as on related measures to assure financial security for investors. WP2.D3 “Investigations on methods supporting the investment in large solar heating systems” forms the summary of these investigations. The exceeding of the foreseen time frame is on behalf of the coordination partner arsenal research, which took over the coordination and authoring of WP2.D3.

Being another issue of subtask 3, “Exchange of experience on simple monitoring methods”, which is not directly represented in a deliverable according to the work plan will be considered in WP2.D5 as an important part of technical guidelines the installation of large solar thermal systems.

WP2.D4 “Material for marketing SDHW systems to investors in the building industry” forms yet another deliverable of subtask 3. It became obvious, that instead of a physical marketing brochure for the whole of Europe, collecting examples from throughout Europe for such materials and providing those jointly as PDF files together with an analysis of similarities and design criteria is much more advantageous to serve as the base for future professional marketing material. As stated at the beginning, due to the large number of topics to be addressed in WP2, this issue happened to result in a rather short report as it was facing synergies with one parallel executed EC-funded project, where a special focus is put on marketing issues of large solar thermal systems.

Concerning subtask 2, the work plan, originally outlining WP2.D5 “Technical and financial guidelines (standardised concepts) for installation of SDHW systems in larger buildings” with a due date of month 18 while the corresponding milestone WP2.M3 “Definition of standardised system concepts” is due to month 24, has been refined here.
From a chronological point of view, WP2.D5 is supposed to include the achievements of the whole WP2. As the definition of “standardised system concepts” is due to month 24, WP2.D5 is now foreseen to be delivered in month 24 as well.

To round up the work in WP2, an additional deliverable has been decided to be compiled summarising the work of subtask 2 on technical issues to have a corresponding deliverable to WP2.M3. Being the core issue of WP2, for this additional deliverable, work has been on the way in the first reporting period concerning subtask 2 issues “Components” and “Technical issues”. Work has been split up to the partners AEE INTEC, Demokritos and Uni Oslo. The technical investigations and evaluation of best practise system concepts have so far led to draft reports of the respective issues. As a summary of the investigations on standardised system concepts and standardised components, the mentioned additional deliverable will be prepared until month 24.

Representing the issues to be addressed in subtask 4 “Development of standardised concepts for larger solar heating systems”, the preparation of technical guidelines for technical stakeholders as well as organisational guidelines for representatives in the building industry, both incorporating the results on standardised system concepts will be subject of the upcoming months and will find its summary in WP2.D5.

List of Deliverables (1st Reporting Period) - Work package 2

Del. no.	Deliverable name	Work-package no.	Date due	Actual/ Forecast delivery date	Estimated indicative person-months	Used indicative person-months	Lead contractor
WP2.D1	Questionnaire concerning larger solar thermal systems	2	6	12	2.0	5.1	3
WP2.D2	National workshops (3 to 4) with planners and building industry	2	Div	Div	3.0	1.5	3
WP2.D3	Report concerning investigation and evaluation of existing financing models	2	12	18	2.0	3.5	3
WP2.D4	Material for marketing SDHW systems to investors in the building industry	2	18	18	2.0	1.5	3
WP2.D5	Technical and financial guidelines	2	18	24	2.8	4.5	3

List of Milestones (1st Reporting Period) - Work package 2

Milestone no.	Milestone name	Workpackage no.	Date due	Actual/Forecast delivery date	Lead contractor
WP2.M1	Questionnaires evaluated	2	12	18	3
WP2.M2	Technical investigations concluded, best practice models defined	2	18	24	3

WP3: Integration in buildings

Responsible Lead contractor of WP3:
Participant No. 15: Arbeitsgemeinschaft Erneuerbare Energie, Institute for Sustainable Technologies, (AEE INTEC)

a.) Building Integration Requirements and Methods

Inventory of Existing Requirements and Guidelines

The first step in this work package was to establish an overview of requirements and guidelines based on available (national) guidelines and standards in the participating countries. The focus was here on the integration of solar thermal components in the building envelope rather than requirements on the solar thermal components themselves. Standards and guidelines regarding the following aspects were included in the study:

- Strength of construction (wind/snow)
- Fire risk
- Construction damage
- Thermal requirements
- Rain and moisture penetration
- Environmentally problematical materials

An inventory of the existing regulations, guidelines and national standards was put together. The inventory is included in the annex as deliverables WP3.D1 and WP3.D2. It includes the name and number of each guideline, a short description of the contents, the name of the publisher and the date of publication. For many guidelines, there is also additional information in the appendix of the inventory. A source where these guidelines can be obtained from is also stated. In most cases, these are the national standardization bodies or else the source is mentioned in the notes section in the appendix.

The following institutions contributed to the inventory of existing requirements and guidelines: AEE INTEC, Arsenal research (Austria), CSTB (France), ITW (Germany), TNO (The Netherlands), University of Oslo (Norway), INETI (Portugal) and SP (Sweden).

The second step was to establish an expert group that deals with gaps in knowledge and regulations and works on solutions for building integration. The goal is to make recommendations for uniform European requirements for building integrated solar thermal

components that make it easier for planners and architects to realize projects with integrated collectors.

The following institutes participate in the expert group:
ITW (Germany), AEE INTEC (Austria), TNO (The Netherlands), European Solar Thermal Industry Federation, ESTIF, CSTB, (France)

In order to be able to find gaps in knowledge and regulations, a small survey was conducted among planners and architects in each participating country. The goal was to find out which problems are encountered when a project is planned and realized and what kind of European regulations would be helpful to facilitate the planning, approval and construction process.

Each participating institution chose a few planners or architects or those people in their country who have the most experience with building integration of solar collectors and know the problems that occur in practice.

The answers were then summarized and are the basis for deliverable WP3.D3. A draft version of this report is available and is under discussion within the expert group. A final version of the report is planned to be completed by the end of April 2006.

Workshops on Building Integration

Industry workshops are organized by several project partners on the state of the art and options concerning integration of solar thermal functions in building components.

The workshops will focus mainly on the national activities in the country where the workshop is taking place. However, to have an input of good examples of building integration from all countries participating in the NEGST project, a collection of such good examples was made. Each partner supplied a few good examples including a good resolution picture of the example and a short description of it as well as information what the special characteristics concerning building integration are. A summary document was prepared containing a small version of the photo and the text information on each example. This document and the high resolution version of the photos was included on a CD that was sent to each participating institution. The cover of the CD is shown in the figure on the right. The entire overview is included in the annex.

Cover of the CD containing „Building integration examples“

In the first reporting period, two workshops on building integration have taken place,

- 4 November 2005, Oslo (participation of University of Oslo)
- 11 November 2005, St. Pölten, Austria (organized by AEE INTEC)
- 23 November 2005, Lisbon, Portugal (organized by INETI)

Another one was planned for January 2006 but had to be cancelled because of too few participants. A new workshop in Sweden is planned to take place in November 2006

- 24 January 2006, Stockholm, Sweden (organized by SERC and SP)

Some of the workshops specifically target the building integration topics, in other cases building integration is part of a more general workshop on solar thermal. More workshops are planned in other countries but the dates are not fixed yet.

b.) Integration of Solar Thermal Components in Conventional Heating Appliances

The goal of this part of work package 3 is to disseminate efficient methods for integration of solar thermal product into the energy installations of new and existing buildings.

To reach this goal, information on integration concepts of solar thermal products that are already on the market and promising concepts that have not been realized yet are collected from the participating countries. They were then put together into a report. Subsequently, magazine articles will be written for dissemination in the participating countries. The articles should be published in relevant magazines for the solar industry.

For the collection of available material, a template was created based on typical conventional heating systems for both single-family and multi-family buildings. The template has been sent out to the participants and has been filled in for each country with integration concepts for each conventional system. All partners participating in WP3 are contributing to this deliverable.

The report on integration of solar thermal components in conventional heating appliances (WP3.D5) is included in the annex.

List of Deliverables (1st Reporting Period) - Work package 3

Del. no.	Deliverable name	Work-package no.	Date due	Actual/ Forecast delivery date	Estimated indicative person-months	Used indicative person-months	Lead contractor
WP3.D1	Reports of meetings to bring together existing requirements and methods	3	Div	14	1.0	1.8	15
WP3.D2	Overview of existing requirements in EU countries and directives	3	12	14	2.0	5.1	15
WP3.D3	Recommendations for uniform European requirements	3	18	22	2.0	1.7	15
WP3.D4	Workshop on integration of thermal solar functions into building components	3	18	ongoing	2.0	2.1	15

WP3 .D5	Recommendation of concepts for easy installation and integration in conventional heating appliances	3	18	20	1.4	1.2	15
WP3 .D6	Articles in dedicated magazines for solar industry	3	Div	Div	1.4	0.5	15

List of Milestones (1st Reporting Period) - Work package 3

Milestone no.	Milestone name	Workpackage no.	Date due	Actual/Forecast delivery date	Lead contractor
WP3.M1	Inventory of existing guidelines	3	6	10	15
WP3.M2	Recommendations for integration of solar thermal	3	12	18	15

WP4: Towards the next generation of standards

Responsible Lead contractor of WP4:
Participant No. 7: European Solar Thermal Industry Federation a.i.s.b.l. (ESTIF),

Work package objectives and starting point of work at beginning of reporting period

Initially it was foreseen that work would focus on the following fields:

1. advanced collectors
2. advanced stores
3. advanced controllers
4. combisystems
5. solar cooling
6. solar desalination
7. fluids
8. LCA (Life Cycle Assessment)
9. dissemination

It was decided to skip the issue: “combination of solar thermal and heat pump technology”. Instead a new item: “conversion from m² to power and energy” was taken up – see also: “Deviations from the project work program “

The aim of the work in this work package is to:

- agree on priorities for urgent needs for standards concerning test methods and requirements
- exchange of experience and know-how in testing and test methods for new and advanced systems, components and applications
- work towards a common European approach on testing and standardisation
- validate test methods and do inter-lab comparisons
- pass on to CEN/TC312 requests as a basis for initiating standardisation in those fields which have urgent needs

Progress towards objectives – tasks worked on and achievements made with reference to planned objectives, identify contractors involved

WP4.1 Advanced collectors

The work in WP 4.1 "Advanced collectors" is bit behind schedule, in terms of internal WP 4.1 deadlines, but still on the track in terms of global deadlines for NEGST. The first part of the draft documents will be produced for the Lisbon meeting in March 2006.
A short list of work performed is given below (detailed subtask report available on the project website (http://www.solarkey.dk/negst-wp4-web/wp4-0-general/interim-gen/NEGST-WP4-1-status05-f.doc):

- A questionnaire has been sent around to the key actors in the field for defining fields of interest and needs, which has also been discussed at industry workshops. The results of analysis of answer and discussion are given in "List of document to be produced" (link to document given in next paragraph "Deviations from …") (SP)
- Investigations on multiaxial incidence angle modifiers have been carried out. The results, showing that significant accuracy improvements can be reached for some special geometries, have been presented at the ISES 2005 conference (SP)
- A number of evacuated tube collectors was tested at SP during this summer. These tests have made it obvious that the collector models applied in performance testing according to EN 12975 have to be further developed in order to model Dewar type collectors more accurately (SP)
- Furthermore experience has been gained in mechanical load tests on ETCs and also regarding the high sensitivity of the collector efficiency to construction details, which might be a reason to reconsider the way this collector type (Dewar, in particular with heat pipe) shall be tested and quality controlled in the future (SP)
- State of the art is reported on accelerated ageing and determination of optical properties of collector components (SP)
- Investigations on test methods for an ordinary flat plate collector have been carried out. The investigations focused on: the temperature levels used to determine efficiencies; requirements on weather conditions; methods to determine the mean solar collector fluid temperature; methods to determine the useful power of the collector. The results are being analysed and will be presented at EUROSUN 2006 in June 2006 (DTU)

WP4.2 Advanced stores

The work in WP 4.2 is following schedule.
A short list of work performed is given below (detailed subtask report available on the project website (http://www.solarkey.dk/negst-wp4-web/wp4-0-general/interim-gen/NEGST-WP4-2-status05-f.doc):

- To define fields of interest and needs, the issue has been discussed at industry workshops. The outcome of the discussions are given in "List of document to be produced" (link to document given in next paragraph "Deviations from …") (DTU)
- A variety of tanks that are part of solar combisystems have been tested. The test method selected did without detailed modelling, but focused on realistic test conditions and the assessment of the overall performance. The experiences gained through the application of the test method shall be summarised and conclusions presented (SPF).
- An innovative store of a DHW-system has been investigated thoroughly according to the component test method (similar to the method described in EN 12977). Results of this investigation shall be presented and possible conclusions discussed (SPF).

- A solar combi-system from Solvis GmbH & Co KG has been tested in a laboratory test facility. The system has a heat storage with a side-arm with an external heat exchanger for domestic water heating, which also shows where temperature sensors are mounted. The tests showed that the heat loss from the side-arm is large.
- A CFD (Computational Fluid Dynamics) model of a simple heat storage with an external heat exchanger for hot water preparation has been built. Calculations with the model will elucidate how thermosyphoning in the side-arm will influence the heat loss of the heat storage for different designs of the side-arm.

WP4.3 Advanced controllers

The overall goal of the work carried out in this task is the further development of test methods for advanced controller and the description of the test methods in such a way that they could easily be incorporated in an appropriate standard.

Until now a survey about the major important topics for the identification of future work items was carried out among involved stakeholders.

Resulting from this it was decided to focus on the following items:

- Development of test methods for controllers working with variable flow, e. g. adjusting the flow in such a way that a certain temperature or temperature difference is achieved
- Development of test methods for the evaluation of the energy consumption of pumps and controllers (e. g. based on nominal power and operation time)
- Development of test methods for controllers, managing both the thermal solar system and additional facilities, e. g. the auxiliary heating system

In general the work related to “advanced controllers” is proceeding according to the time schedule. First draft versions of the above mentioned documents / procedures will be available in spring 2006.

Detailed subtask report available at the project website (http://www.solarkey.dk/negst-wp4-web/wp4-0-general/interim-gen/NEGST-WP4-3-status05-f.doc):

WP4.4 Combi-systems

The overall goal of the work carried out within this sub-work package is the further development of test methods for solar combisystems and the description of the test methods in such a way that they could easily be incorporated in the standards of ENV (TS) 12977 during a future revision.

Within this sub-work package the subsequent topics will be treated and the following documents will be produced :

- Document describing testing experience with systems (stores) where the burner is either integrated.
- Document describing an (updated/new) method for calculation of the energy performance of solar combisystems in the framework of the EPBD (European Building Performance Directive)
- Document describing an updated procedure of the Direct Characterisation (DC) test method for solar combisystems into a draft European standard (e. g. for EPBD calculation procedure).

- Report describing the result of the discussion and comparison of different performance test methods (e. g. CTSS and DC) e. g. by inter-laboratory comparison test of a common solar combisystem.

Detailed subtask report available at the project website (http://www.solarkey.dk/negst-wp4-web/wp4-0-general/interim-gen/NEGST-WP4-4-status05-f.doc):

WP4.5 Solar cooling

The work in WP 4.5 is a bit behind the initial internal schedule, but still on the track in terms of global deadlines for NEGST. First part of the draft documents will be produced for the Lisbon meeting in March 2006.
A short list of work performed is given below (detailed subtask report available on the project website (http://www.solarkey.dk/negst-wp4-web/wp4-0-general/interim-gen/NEGST-WP4-5-status05-f.doc):

- A questionnaire has been sent around to the key actors in the field for defining fields of interest and needs, which has also been discussed at industry workshops. The results of analysis of answer and discussion are given in "List of document to be produced" (link to document given in next paragraph "Deviations from …") (INETI)

WP4.6 Solar desalination

The work in WP 4.6 is following the initial internal schedule.
A short list of work performed is given below (detailed subtask report available on the project website (http://www.solarkey.dk/negst-wp4-web/wp4-0-general/interim-gen/NEGST-WP4-7-status05-f.doc):

- A questionnaire has been sent around to the key actors in the field for defining fields of interest and needs, which has also been discussed at industry workshops. The results of analysis of answer and discussion are given in "List of document to be produced" (link to document given in next paragraph "Deviations from …") (NCSR Demokritos)
- The following problems, connected to the use of materials in solar desalination plants have been identified: corrosion; formation of organic depositions (NCSR Demokritos)
- The materials that have been considered for potential use in a saline environment are: alloys of Cu-Ni; steel (with or without surface treatment); stainless steel; titanium (NCSR Demokritos)
- A reference system has been identified as a basic multi-effect process driven by glazed collectors, both ETC and flat plate.
- A preliminary survey is being carried out in order to assess the best suitable equations that may be used for predicting the output of the system, which can be characterized through the specific fresh water production (m^2 of collector area required for producing a m^3 of desalted water) evaluated on annual basis.

WP4.7 Solar fluids

The work in WP 4.7 "Solar Fluids" is ahead of schedule and close to final. See detailed subtask report available on the project website (http://www.solarkey.dk/negst-wp4-web/wp4-0-general/interim-gen/NEGST-WP4-8-status05-f.doc.
A short résumé:
Based on an initial survey the following focus areas were defined:

- Corrosion/lifetime test for solar fluids
- Properties and standard tests of solar fluids and recommendation for the use of these standards

- Determine missing testing procedures

Four advanced drafts have been produced:

- Report on corrosion and lifetime tests for solar fluids
- Report on properties and standard tests of solar fluids
- Recommendation for the use of standards for solar fluid parameters
- Recommendation for elaboration of missing testing procedures

WP4.8 LCA

The work in WP 4.8 is following the initial internal schedule.
A short list of work performed is given below (detailed subtask report available on the project website (http://www.solarkey.dk/negst-wp4-web/wp4-0-general/interim-gen/NEGST-WP4-9-status05-f.doc):

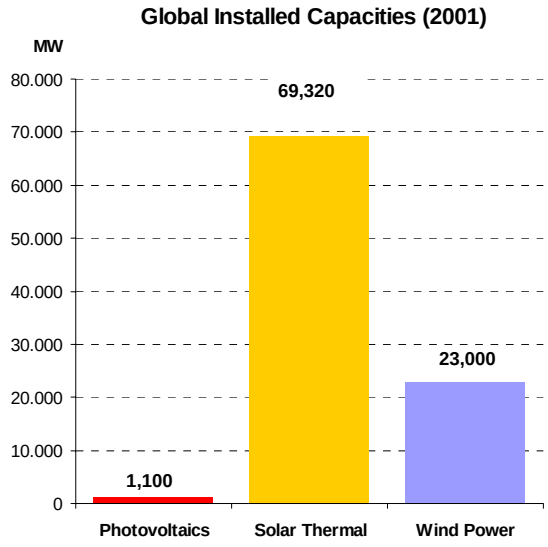
- A literature survey together with knowledge information collection from all NEGST participants has been done during autumn 2004 and spring 2005 (SP)
- A state-of-art-article was presented at ISES 2005 in Florida (SP)

WP4.9 m² -> power & energy

The work in WP 4.9 is following the initial internal schedule.
A short list of work performed is given below:

- The paper "Conversion of m² to power and energy" (http://www.solarkey.dk/negst-wp4-web/wp4-10-m2pe/m2p-fd.doc) giving the technical background for a very simple and general conversion from m² to power has been produced. This paper resulted in the joint press release (IEA, ESTIF, …) Joint PR: Solar Thermal Capacity (ESTIF/SolarKey)
- Several internal discussion papers on the m² -> energy (power -> energy) issue has been elaborated (ESTIF/SolarKey and ENEA)

Globally Installed Capacities of different Renewable Energies



Source: Solar Thermal from IEA-SHC PV and Wind Power from UNDP's World Energy Assessment: Overview 2004 Update.

Global installed capacities of different renewable energy sources in 2001 (figure from joint press release of ESTIF, IEA-SHC and others – IEA-SHC web site). Link to complete press release:
http://www.iea-shc.org/welcome/Press%20Release%20-2070GW%20solar%20thermal%20capacity.pdf

WP4.10 Dissemination

The dissemination activities have been:

- Press release on the conversion of m² of collectors to collector thermal power capacity – see above. This has had a big impact. It is now possible on a common agreed basis to do this conversion and in this way compare installed power capacity of solar thermal with other technologies, e.g. wind and PV. And it shows now very clearly that that solar thermal is indeed an important technology in the "renewable scene" – figure below. (ESTIF/SolarKey)
- 2 industry workshops have been held in connection with ESTIF general assemblies (ESTIF/SolarKey)
  - 5/12, 2005 in Brussels – session also including other standardisation/certification matters
  - 25/11, 2004 in Brussels – dedicated NEGST WP4 session
  - Presentation at the estec2005 conference: "Next Generation of Standards - New Generation of Solar Thermal Systems (NEGST) – Work Package 4" (ESTIF/SolarKey)
- Participation in CEN TC312 technical committee meeting (Sophia-Antipolis, January 2005) and WG3 meetings (5 meetings) – informing about the ongoing NEGST WP4 work (ESTIF/SolarKey).

Deviations from the project work program, and corrective actions taken/suggested: identify the nature and the reason for the problem, identify contractors involved

On an overall level it was decided to skip the issue: "combination of solar thermal and heat pump technology". Instead a new item: "conversion from m² to power and energy" was taken up. ESTIF/SolarKey will be responsible for the new work item and ENEA will give assistance – so will the rest of the project participants on commenting level.
Also a special dissemination task was included (ESTIF) – resulting in the updated list of subtasks given below:

1. advanced collectors
2. advanced stores
3. advanced controllers
4. combisystems
5. solar cooling
6. solar desalination
7. fluids
8. LCA (Life Cycle Assessment)
9. m² -> power and energy
10. dissemination

In the table below is seen who is responsible for doing what.

		SUBTASK													
Proposer	Name	0	1	2	3	4	5	6	7	8	9	10	11	Total contract 2004	PM	PM - subcontractor
1	ITW		x	x	x	x	x				x	x	x	48.776	3.8	3.6
2	SPF		x	x				x		x	x	x		14.490	1.4	
3	arsenal		x				x					x	x	15.667	1.2	
4	TNO		x			x	x	x				x	x	27.590	1.4	
5	SP		x			x	x				x	x		74.131	6.0	
6	ENEA		x				x		x		x	x	x	21.600	3.5	
7	ESTIF	x										x	x	54.144	4.6	2.6
8	INETI		x				x					x	x	18.000	3.5	
9	Demokritos						x		x			x	x	18.306	2.6	
10	CSTB				x	x	x			x		x		9.945	0.9	
11	INTA					x	x				x	x		10.947	0.9	
12	SERC		´+					´+		´+			´+			
14	Ecofys		x									x	x	4.773	0.3	
15	AEE												´+			
18	DTU		x	x	x	x						x		31.296	4.6	
TOTAL														349.665		

Colour codes:	WP4 co-ordinator	WP4 subtask responsible	Ass. sub.resp	Active WP4 participants

Subtask 6 is skipped due to very low interest from participants and industry

- TNO gives enhanced assistance to ITW in subtask 4
- SFP concentrates on fluids

Subtask 10 is included

Table: "Who does what in WP4"

On a detailed level the work in the different subtasks has been defined in a number of documents to be produced – basic resource documents as well as proposal for test procedures etc.. This extensive list of documents - which is discussed with industry through work shop discussions and questionnaires - is given in "List of document to be produced": http://www.solarkey.dk/negst-wp4-web/wp4-list-of-documents.xls

List of Deliverables (1st Reporting Period) - Work package 4

Del. no.	Deliverable name	Work-package no.	Date due	Actual/ Forecast delivery date	Estimated indicative person-months	Used indicative person-months	Lead contractor
WP4 .D1	Minutes/report 1. meeting	4	Aug. 2004	Aug. 2004			7
	Minutes/report 2. meeting		Apr. 2005	Apr. 2005	in total	in total	
	Status reports of subtasks		Dec. 2005	Dec. 2005	20.0	20.4	
	Main WP4 status report as basis for the co-ordinators status report – 1st period		4/3 - 2006	4/3 - 2006			

List of Milestones (1st Reporting Period) - Work package 4

Milestone no.	Milestone name	Workpackage no.	Date due	Actual/Forecast delivery date	Lead contractor
WP4.M1	Agreement on focus areas for more detailed work	4	6	Aug. 2004	7
WP4.M2	Final list of documents and procedures to be produced	4	6	Aug. 2004 + rev. Apr. 2005	7
WP4.M3	Status report	4	18	4/3 - 2006	7

WP5: Advanced applications

Responsible Lead contractor of WP5:
Participant No. 6: Ente per le Nuove tecnologie, l'Energia e l'Ambiente (ENEA),

Work package objectives
The main objective of this work package is to create a forum for the investigation of seawater desalination and cooling systems powered by solar thermal energy at low to medium temperatures.
Several suitable technologies for solar cooling, such as absorption chillers, adsorption chillers, and desiccant cooling cycles, are currently available. The same is in principle appropriate for the different technologies for the desalination of brackish and seawater, such as multi-stage flash, multi-effect distillation, thermo vapour compression.
Due to specific technological and cost related advantages and disadvantages, it is still open, which will be the technology of tomorrow. Therefore, with regard to effective future developments and an associated further wide spreading of solar thermal collectors technologies, it is important to identify the most promising technologies.
The main activities of this work package are predominantly focused on:
- Up-to-date status report of the different solar thermal cooling and desalination technologies
- Investigation of different collector technologies with regard to different cooling and desalination technologies
- Development of user-friendly design and simulation software for the promotion of these technologies
- Workshops for knowledge transfer and experience exchange as well as for the identification of the most promising technologies for both solar cooling and solar desalination
- Feasibility study in order to identify potential application areas in European as well as in the Mediterranean belt.

Overview of activities carried out:
The overall objective of the NEGST project is to support the development and the introduction to the market of more cost-effective solar thermal systems. In this framework, NEGST Work Package 5 deals with the assessment of the potential of solar thermal systems for advanced applications, such as cooling and desalination.
Really, the extension of the range of application, traditionally limited to hot water preparation and/or space heating, could act positively for a further diffusion of solar thermal systems and, at the same time, could encourage the development of innovative concepts. In this context, an

overview on all cooling and desalination technologies, which can be suitable for the coupling with low to medium solar collectors, constitutes a preliminary action towards the aforesaid final goal.

The first step of Work Package 5 is an investigation of the following main aspects relevant to all cooling and desalination technologies, which can be in theory powered by low to medium temperature solar thermal collectors:

- description of the working principle;
- assessment of the global energy requirements;
- some economic aspects;
- advantages and drawbacks focused on the possible coupling with solar systems;
- development status and potential commercial diffusion

Furthermore, an overview of the current EU market of both traditional cooling and desalination technologies has been carried out, in order to evaluate the potential of diffusion of solar thermal systems.
An assessment of heating and cooling loads for typical installations (residential and office buildings) representative of different European climates has been performed also. The related simulations have been based upon the most recent data available in the literature.
The result of this investigation is a “Technical Status Report” (WP5.D1), which main target is to support the selection of the most promising technology both for solar cooling and desalination, which will be deeply investigated throughout the following steps of this work package. For this purpose, a preliminary screening criterion, based upon an energy saving approach, has been introduced.
From the survey of cooling systems it can be noticed that, despite the fact that in Europe solar driven air-conditioning systems are still in a development stage, several technologies, which can be in principle coupled to solar thermal collectors, are currently available in the market. Considering also all the possible configurations for each technology and the different types of usable collectors, a wide range of solar driven air-conditioning systems has been identified.
To limit the number of the systems to be compared, a first screening criterion, based upon COP values, has been applied. Thus, cooling systems with modest performance figure have been excluded due to the large amount of collector area needed to meet a given cooling load. For the remaining cooling technologies, the comparison has been limited, in this initial stage of the work, to the global energy performance. This evaluation has provided some useful indications to select the most interesting solar cooling system, according to the type of user (only cooling or both heating and cooling), the ratio between cooling and heating loads, the climate conditions, and the amount of primary energy to be saved.
From the result obtained, it can be drawn that evacuated tubular collectors seem to be the most suitable solar technology to be coupled with low temperature cooling systems (single effect water/LiBr absorption chillers, DEC systems or adsorption chillers) and, furthermore, the aforesaid cooling technologies driven by this type of collector seem to be absolutely the most energy-effective solar cooling systems for installations located in hot climate regions. Quite the opposite, advanced solar technologies, such as parabolic trough collectors having a high performance figure, could become competitive in sites characterized by heating loads comparable or greater than cooling loads and with an adequate level of direct solar radiation. In this case, cooling machines based on a reversible cycle, such like absorption chillers using ammonia/water as working pair, could have real perspectives of development, in particular if a more cost-effective concentrating solar technology will be available on the market.
Concerning desalination, a similar analysis has identified the multi-effect evaporation as the most qualified candidate for the role of reference desalination process to be coupled with solar thermal collectors, due to several favourable characteristics, such like the relatively high

performance ratio, the reduced working temperature and the adequate flexibility to the load variation. On the other hand, ME plants are currently erected starting from a capacity around 500 m³/d in order to achieve reasonable economies of scale. This figure corresponds to the fulfilment of the fresh water requirements of nearly 3000 people, if the use is limited to residential civil needs. Clearly smaller capacity systems aimed at specific applications are in principle possible, but the capital cost, which is normally extremely sensitive to the plant size, would rise dramatically. Furthermore to reduce the required collector area, an adequate performance ratio must be reached via an increase in the number of effects and, as a result, in the plant complexity and dimensions. Therefore a centralized production in a desalting plant of significant capacity is certainly more convenient, considering also that fresh water can be easily stored and transported over a relatively long distance.
Quite the opposite, for cooling a localized production is needed and both absorption chillers and desiccant cooling systems for small-scale applications are by now commercially available. This represents a notable discriminating factor, since the further penetration to the market of solar thermal collectors, which is the main target of the NEGST Project, would significantly benefit from the commercialisation of pre-assembled products, simple to install and manage. In conclusion the work relevant to the development of desalination systems driven by solar thermal collectors must concern principally the improvement and cost reduction of small capacity ME plants.
Finally, from the results of the comparative analysis it can be drawn that the most interesting system configuration, beside the basic ME process, is the inclusion in it of a double-effect absorption heat pump, using H2O/LiBr as working pair.

The results obtained in the first step of this Work Package constitute a preliminary contribute towards the assessment of the most suitable technologies for the coupling with low to medium temperature solar thermal collectors, both for cooling and desalination.
For an extensive analysis, other aspects such as: level of commercial maturity, economic potential, presence of technological barriers and so on, have to be deeply investigated.
A definitive selection of the most promising solar cooling and desalination systems and their level of interest as a possible incentive to the market of solar thermal collectors in Europe is analysed in the second step of Work Package 5.
For this purpose, an evaluation tool, based on a questionnaire, has been carried out. This working document (WP5.D2) mainly aims to collect opinions of each WP5 participant in order to achieve the above-mentioned target.
In particular, the attention has been focused on the following main aspects:

- level of interest in both solar cooling and desalination in each EU countries;
- level of applicability of both solar cooling and desalination technologies in the near to medium term;
- perspective of development;
- technological and economic advantages and drawbacks.

Progress towards objectives
Contractors involved in this work package: ENEA (WP leader), ITW, Arsenal, INETI, Demokritos, CSTB, INTA, SERC, University of Kassel, AEE INTEC, Politecnico of Milan.

WP5-Task 1: Technical Status Report
In agreement with the initial action plan, the work has been distributed amongst the participants on the basis of the efforts involved in this work package and the agreement reached after the kick off meeting on the topics to be investigated. The contributions delivered by each participant, concerning the survey of the different cooling and desalination

technologies, have been assembled and revised in order to harmonize the whole document. A definitive assessment of heating and cooling loads has been carried out for typical installations (residential and office buildings) representative of different European climates. From the survey of cooling and desalination systems and considering all the possible configurations for each technology and the different types of usable collectors, a range of solar driven cooling/desalination application has been identified. From the collected data and after a preliminary screening, a comparative analysis, based on energy saving approach, has been performed and related results presented. **The task has been successfully completed**.

WP5-Task 2: Report concerning the suitability of different collector technologies for solar cooling and solar desalination

In agreement with the work plan, it has been sent out a working document containing a questionnaire for collecting opinions of each WP5 participant in order to select the most promising solar technologies for cooling and desalination. From the delivered information different significant aspects, such as the level of interest in the specific technology, the perspective of development, the possibility of cost reduction and the presence of technological barriers, have been evaluated and the related results are presented. **The task has been successfully completed.**

WP5-Task 3: Design and simulation software

The scope of this sub-task is the implementation of simplified simulation model in order to support the promotion and market penetration of solar driven technologies.
The main topics that have to be focused in this work are:

- Detailed description and performance analysis of the technologies selected during the previous steps
- Overview of existing software dealing with this issue
- Identification of critical aspects to be investigated
- Implementation of simplified models.

In particular, with respect to the selected systems, it will be investigated and developed (if any) simplified correlations for predicting the output of the system in various operational conditions, based upon information available in literature or elaborations carried out by means of well-known simulation models applied to different solar cooling/desalination system configurations.
The activity is now in progress and it is substantially in agreement with the respective action plan. Final results will be stated by June 2006.

WP5-Task 4: Workshop on solar cooling and solar desalination

Not yet started.

WP5-Task 5: Feasibility study in order to identify the potential areas for these applications

Not yet started.

Deviation from the project work program

The activities are substantially in agreement with the original work plan, thus no variation was needed.

List of Deliverables (1st Reporting Period) - Work package 5

Del. no.	Deliverable name	Work-package no.	Date due	Actual/ Forecast delivery date	Estimated indicative person-months	Used indicative person-months	Lead contractor
WP5 .D1	Technical status report on solar desalination and solar cooling	5	12	November 2005 (actual)	2.0	11.2	6
WP5 .D2	Report concerning the suitability of different collector technologies for solar cooling and solar desalination	5	18	March 2006 (actual)	9.0	3.6	6

List of Milestones (1st Reporting Period) - Work package 5

Milestone no.	Milestone name	Workpackage no.	Date due	Actual/Forecast delivery date	Lead contractor
WP5.M1	Technical status report	5	12	November 2005 (actual)	6
WP5.M2	Identification of most promising technologies	5	18	March 2006 (actual)	6

WP6: Project Management and dissemination of project results

Responsible Lead contractor of WP6:
Participant No. 1: University of Stuttgart, Institut für Thermodynamik und Wärmetechnik (ITW)

The management of the consortium is briefly described in the following section 3. Since the tasks carried out in WP6 are directly related to the project management and the dissemination of the project results the documentation related to this work package is included in section 3. Further information about the project management can be found in the periodic project management report for the first reporting period.

List of Deliverables (1st Reporting Period) - Work package 6

Del. no.	Deliverable name	Work-package no.	Date due	Actual/ Forecast delivery date	Estimated indicative person-months	Used indicative person-months	Lead contractor
WP6 .D1	Consortium Agreement	6	6	May 2005 (actual)	0.5	0.5	1

WP6 .D2	Project Presentation	6	6	March 2006 (actual)	0.5	0.5	1
WP6 .D3	Project website	6	div.	March 2006 (actual)	2.0	1.0	1
WP6 .D4	Two workshops will be arranged for the industry	6	18 / 30	March 2006 (actual)	1.0	0.2	1
WP6 .D5	Printed or electronic special publications	6	div.	March 2006 (actual)	0.5	0.5	1
WP6 .D6	Interim report	6	18	March 2006 (actual)	1.0	1.0	1
WP6 .D7	Presentation at European Solar Thermal Energy Conference estec2005	6	18	March 2006 (actual)	0.7	0.2	1
WP6 .D8	Special seminars focused on possible specific project results	6	div.	March 2006 (actual)	1.0	0.1	1
WP6 .D9	Management reports	6	12 / 24	March 2006 (actual)	1.0	1.1	1

List of Milestones (1st Reporting Period) - Work package 6

Milestone no.	Milestone name	Workpackage no.	Date due	Actual/Forecast delivery date	Lead contractor
WP6.M1	Kick-off meeting	6	2	July 2004 (actual)	1
WP6.M2	Project meetings	6	11/20/30	April 2005 / March 2006 (actual) January 2007 (forecast)	1

SECTION 3:
Consortium management

The legal basis for the management of the consortium is provided by the consortium agreement. The responsibilities of the different bodies as well as general aspects related to the management of the project and the individual responsibilities are described in detail in the Consortium Agreement. Since the consortium agreement is attached to this report as deliverable WP6.D1 no further details will be described at this point.
The consortium agreement was elaborated by the co-ordinator and signed by all participants already before the kick-off meeting.

The management of the whole consortium is performed by the co-ordinator. Major decisions are made during the project meetings. Furthermore the project meetings act as a platform for experience exchange and inspiring discussions.

Up to now the following project meetings took place:
- Stuttgart, Germany, July 26th-27th, 2004
- Oslo, Norway, April 13th-15th, 2005
- Lisbon, Portugal, March 8th-10th, 2006

The last project meeting is scheduled as follows:
- Rapperswil, Switzerland, January 17th - 19th, 2007

In average over the three meetings held so far, approximately 98 % of the project participants were present. This high participation rate ensured excellent working conditions.

The co-ordinator is supported by a steering committee consisting of the work package leaders. Up to now three steering committee meetings were held in conjunction with the project meetings. The task of the steering committee is also described in detail in the consortium agreement and will therefore not be repeated here. No serious decisions had to be taken by the steering committee, since up to now the whole project runs quite smoothly.

One important element of the management consortium is the project internet web site available under http://www.swt-technologie.de/html/negst.html.
This instrument is used for internal information exchange in a password protected section as well as for the public dissemination of the project results. Furthermore an email mailing list is available via that e-infrastructure instrument.
Since part of the co-ordination is subcontracted to SWT (Solar- und Wärmetechnik Stuttgart) the NEGST-homepage is located on the internet domain of SWT.

Project barchart and status

As already mentioned previously the total formal duration of the project as foreseen in the contract is 36 months, but the project was originally designed for an effective duration of 30 month (see also bar chart). Now, as the consortium decided to extend the effective project duration by two month to 32 months, this is uncritical with regard to the whole duration of the project.

Month→ Task↓	**0 - 6**	**7 - 12**	**13-18**	**19-24**	**25-30**	**31-36**
WP1: Next generation of systems						
WP2: Standardised system concepts						
WP3: Integration into buildings						
WP4: Towards the next generation of standards						
WP5: Advanced concepts						
WP6: Project management						

Up to now the management of the consortium proceeds as estimated and no major problems occurred. There has been no need to change major responsibilities within the consortium or to change the consortium itself.

Much more detailed information about the management of the consortium, especially with regard to cost figures, is available in the periodic management report.

Finally, it can be summarised that the management of the consortium is performed in the appropriate way to fulfil the contractual aspects and to achieve the goals of the project.

SECTION 4: OTHER ISSUES

The project is carried out in accordance with fundamental ethical principles.

In general, the use of solar energy is favourable with regard to ethical aspects, since this energy source is available all over the world. Solar energy can be utilised much more uniformly compared to other energy sources like fossil fuels. Hence military conflicts can be avoided. The wider application of solar technology as an energy source will contribute to universal peace.

One objective of the project is to develop more cost-effective solar thermal systems. With cheap solar thermal systems this technology can also be used in developing countries as the sun is available everywhere. Therefore inequality and unfairness can be reduced. Solar energy can easily be used in developing countries without changing local conditions.

A wider use of solar energy will improve our collective quality of life. The crucial point for ethics is long-term sustainability not only for developed, highly productive societies, but for global society as a whole. This can only be achieved by a wider use of renewable energies.

ANNEX
PLAN FOR USING AND DISSEMINATING THE KNOWLEDGE

Section 1 - Exploitable knowledge and its Use

The results of the work carried out within this project will not be directly commercially exploitable (e. g. in form of patents) in such a way, that they will result in financial income of the project partners during the lifetime of the project. This is due to the fact, that it is not foreseen to incorporate the knowledge gained and elaborated during this project into a specific commercial product.

The idea of this project is that the knowledge gained should be spread out as much as possible and everybody should have access to the results. The intention is that the results should be used for further research and industrial exploitation beyond the project lifetime and beyond the consortium. The project participants will have the normal rights to what they produce in the sense that citing or copying from articles and reports shall be done with a reference to the authors, but all written material will be publicly available except:

- consortium agreement (restricted to participants and Commission Services)
- internal project meeting minutes and subtask status reports (restricted to participants and Commission Services)
- material dedicated for the European Standardisation Committee TC312 (restricted for TC312 members, CEN member bodies and Commission Services)
- restricted web site area with internal discussions (restricted to participants and Commission Services)

In general the results of the project can be grouped and exploited based on the 3 categories shown in the following table:

Exploitable Knowledge (description)	**Exploitable product(s) or measure(s)**	**Sector(s)** of application
Project information and presentation	Internet, newsletter, press releases	public, solar thermal branch
Technical reports	Internet	solar thermal branch
Reports related to standardisation work	Internet	TC312 members, CEN member bodies

Table: Exploitation of knowledge

Section 2 - Dissemination of knowledge

In this section the past and future dissemination activities are described in detail.

The description is given in the way that the most important information is listed in the following overview table. The details related to the individual dissemination actives are described in list following the overview table.

Overview Table:

No.	Planned/ actual Dates	Type	Type of audience	Countries addressed	Size of audience	Partner responsible /involved
1	Aug. 2004	Project web-site	General public, research, industry	worldwide	n.a.	ITW
2	Sept. 2004	Press release	General public, research, industry	all of Europe	n.a.	ITW
3	Sept. 2004	Newsletter	General public, research, industry	all of Europe	n.a.	ITW
4	Sept. 2004	Press release	General public, research, industry	Germany	n.a.	ITW
5	Sept. 2004	Press release	General public, research, industry	France	n.a.	CSTB
6	Sept. 2004	Press release	General public, research, industry	Italy	n.a.	ENEA
7	Sept. 2004	Press release	General public, research, industry	Greece	n.a.	DEM
8	Oct. 2004	Press release	General public, research, industry	Sweden	n.a.	SP
9	Oct. 2004	Press release	General public	Germany	n.a.	ITW
10	Nov. 2004	Press release	Research, industry	all of Europe	n.a.	ESTIF
11	Nov. 2004	Workshop	Research, industry	all of Europe	20	ESTIF
12	Dec. 2004	Press release	Higher education	Germany	n.a.	ITW
13	Mar. 2005	Press release	General public, research, industry	Netherlands	n.a.	TNO
14	Apr. 2005	Workshop	Research, planers, architects, industry, decision makers, students	Norway	100	UIO, ITW
15	Apr. 2005	Press release	Research, industry	Germany	n.a.	ITW
16	June 2005	Newsletter	General public, research, industry	all of Europe	n.a.	ITW
17	June 2005	Workshop	Technicians of Energy Agencies	Portugal	22	INETI
18	June 2005	Workshop	Industry, research, research management	Switzerland	20	SPF
19	June 2005	Conference, publication	Research, industry	all of Europe	n.a.	ITW
20	June 2005	Conference, publication	Research, industry	all of Europe	n.a.	ESTIF
21	June 2005	Exhibition	General public, industry	all of Europe, emphasis Germany	50	ITW

22	July 2005	Newsletter	General public, research, industry	Sweden	n.a.	SP
23	July 2005	Newsletter	General public, research, industry	Portugal	n.a.	INETI
24	August 2005	Conference, publication	Research, industry	worldwide	500	SP
25	Sept- 2005	Press release	General public, research, industry	Netherlands	n.a.	TNO
26	Sept. 2005	Workshop	Research, industry	Italy	60	ENEA
27	Sept. 2005	Workshop	General public, research, industry	Germany	50	ITW
28	Oct. 2005	Press release	General public, research, industry	Italy	n.a.	ENEA
29	November 2005	Workshop	Industry, general public	Austria	103	AEE INTEC
30	November 2005	Workshop	Research, industry	Portugal	52	INETI
31	November 2005	Seminar	Industry, research	Denmark	50	DTU
32	November 2005	Workshop	Architects, planners, consultants	Norway	30	UIO
33	December 2005	Workshop	Research departments of Austrian solar industry	Austria	200	AEE INTEC / SPF, ITW
34	December 2005	Seminar	Industry	Norwegian	50	UiO
35	December 2005	Workshop	Research, industry	all of Europe	30	ESTIF
36	January 2006	Seminar	Industry, Research	Nordic	50	DTU, SERC, UiO
37	March 2006	Promotional material	Industry, research, general public	Greece	-	DEM
38	May 2006	Poster	Research, industry	Germany, Austria, Switzerland	300	ITW
39	May 2006	Workshop	Industry	Spain	-	INTA
40	June 2006	Workshop	Research, industry	Austria	-	Arsenal/AEE INTEC
41	June 2006	Workshop	Industry	Greece	-	Demokritos
42	June 2006	Presentation	Research, industry	all of Europe	-	DTU
43	June 2006	Presentation	Research industry	all of Europe	-	DTU
44	2nd part of 2006	Workshop	Industry	France	-	CSTB
45	November 2006	Workshop	Industry	Sweden	-	Uni Oslo, SP
46	November 2006	Seminar	Industry, research	Denmark	-	DTU
47	November 2006	Workshop	Industry, research	Sweden	-	SERC, SP, UiO

n.a. (not applicable)

Details

1	Project web-site http://www.swt-technologie.de/html/negst.html	ITW Aug. 04
2	First Press Release – September 2004 http://www.swt-technologie.de/html/press.html	ITW Sept. 04
3	Newsletter No. 1 – September 2004 http://www.swt-technologie.de/NEG_NL1.pdf	ITW Sept. 04
4	First Press Release in German - September 2004 http://www.swt-technologie.de/html/press.html	ITW Sept. 04
5	First Press Release in French - September 2004 http://www.swt-technologie.de/html/press.html	CSTB Sept. 04
6	First Press Release in Italian - September 2004 http://www.swt-technologie.de/html/press.html	ENEA Sept. 04
7	First Press Release in Greek - September 2004 http://www.swt-technologie.de/html/press.html	DEM Sept. 04
8	First Press Release in Swedish - October 2004 http://www.swt-technologie.de/html/press.html	SP Oct. 04
9	Umweltmagazin; EU-Projekt für Solaranlagen der nächsten Generation; 10/2004 http://www.technikwissen.de/umwelt/aktuell/newsdetail.asp?id=6322	ITW Oct. 2004
10	ESTIF Newsletter: Solar Thermal Capacity	ESTIF Nov. 2004
11	WP4 presentation at ESTIF GA; November 2004 separate workshop before ESTIF GA	ESTIF Nov 2004
12	Stuttgarter unikurier Nr. 94; Solaranlagen der nächsten Generation: Gutes kann noch besser werden; 2/2004, Seite 69-70 http://www.uni-stuttgart.de/uni-kurier/uk94/forschung/fw69.html	ITW Dec. 2004
13	1st Persbericht NEGST: Nieuwe Generatie Zonthermische systemen, 1st press release (translated) submitted to 3 technical journals: TVVL magazine, V&V+, Duurzame Energie	TNO February, March '05
14	4th Rebus project meeting; University of Oslo; April 11-12, 2005 http://energi.fysikk.uio.no/rebus/oslo_rebus.html	ITW, UIO April 2005
15	estec 2005; news; Solaranlagen der nächsten Generation; 2005 http://www.newsletterpage.de/87+M52e6f2bb753.html	ITW April 2005
16	Newsletter No. 2 – June 2005 http://www.swt-technologie.de/NEG_NL2.pdf	ITW June 2005
17	RENAE – National Network of Energy Agencies; Miranda do Corvo; Portugal; June 3rd, 2005 Presentation of NEGST project at a seminar on solar thermal energy	INETI June 2005
18	Industrietag 2005: NEGST-Industry Workshop; Rapperswil, Switzerland; June 2nd, 2005	SPF June 2005
19	estec 2005; New Generation of Solar Thermal – an EU Project; June 21st-22nd, 2005; Freiburg, Germany http://www.estec2003.org/2005/	ITW June 2005

20	estec 2005; Next Generation of Standards (NEGST/WP4); June 22nd, 2005; Freiburg, Germany http://www.estec2003.org/2005/	ESTIF June 2005
21	Intersolar 2005; Neuheitenbörse; Neue Trends bei thermischen Solaranlagen; June 23rd, 2005; Freiburg	ITW June 2005
22	Newsletter No. 2 in Swedish – July 2005	SP July 2005
23	Newsletter No. 2 in Portuguese – July 2005 http://www.swt-technologie.de/NEG_NL2.pdf	INETI July 2005
24	ISES 2005; Towards Procedures for Environmental Performance Assessment of Solar Thermal Products, August 8-12, 2005; Orlando, Florida, USA	SP August 2005
25	First Press Release in Dutch, technical magazines	TNO 2005
26	National Workshop on solar thermal energy with industry; ENEA Research Centre Trisaia, Italy; September 22nd, 2005 Presentation of NEGST project.	ENEA Sept. 2005
27	Workshop Solare Fassaden, 2. Impulskongress innovative Dämmstoffe im Bauwesen, Augsburg, Germany	ITW Sept. 2005
28	Il solea360gradi – Newsletter di ISES Italia, Nr. 9; Focus Tecnologia: “Applicazioni avanzate del solare termico”; 10/2005	ENEA Oct. 2005
29	Seminar - Sonnenkollektoren als Elemente der Architektur, November 11th, 2005, St. Pölten, Austria	AEE INTEC Nov 2005
30	Seminário collectores solares, November 23rd, 2005, Lisbon, Portugal	INETI Nov 2005
31	New solar heating products for a changed market	DTU
32	Workshop „Sol i arkitekturen“, November 4, 2005, Oslo, Norway	UIO Nov 2005
33	Workshop Solare Kombianlagen – Märkte und Innovationen in Europa, December 2nd, 2005, Salzburg, Austria	AEE INTEC Dec 2005
34	"Statkraft-alliansens" brainstorming workshop on on new renewables (with contribution on next generation of solar thermal systems), Hadeland, Norway, December 08-09, 2005.	UiO
35	Workshop on Standards & Certification for ESTIF members (WP4)	ESTIF Dec 2005
36	"Solar Energy Seminar"(with contributions from NEGST partners related to WP1) in Lund, Institute of Technology, Sweden, January 17, 2006 website: http://energi.fysikk.uio.no/rebus/m_lund17012006.html	DTU, SERC, UiO
37	Dissemination of promotional material at the National Renewable Energy Conference	DEM March 2006
38	Otti 16. Symposium Thermische Solarenergie, Neue Trends bei thermischen Solaranlagen - Zwischenergebnisse des EU-Projektes NEGST, May 17th-19th, 2006, Bad Staffelstein, Germany	ITW May 2006
39	NEGST Workshop, WP1 + WP2, Workshop on large solar thermal systems, Seville, Spain	INTA May 2006

40	Qualitätssicherung von großen thermischen Solaranlagen durch optimierte messtechnische Überwachung	Arsenal/ AEE INTEC June 2006
41	Workshop „Qualitätssicherung von großen thermischen Solaranlagen durch optimierte messtechnische Überwachung“, Vienna, Austria	Demokritos June 2006
42	EuroSun 2006; Evaluation of test method for solar collector efficiency	DTU June 2006
43	EuroSun 2006; Development of a compact solar combisystem	DTU June 2006
44	NEGST Workshops - Industry - Presentation of NEGST Project, CSTB, France	CSTB 2nd part of 2006
45	Workshop on large solar thermal systems	SP November 2006
46	Workshop on solar combisystems and heat storage	DTU November 2006
47	Workshop on building integration and promising system technology	SERC November 2006

Section 3 - Publishable results

This section contains a summary of all project deliverables created so far. Further information related to these deliverables can be found in the following table.
To the originally printed version of this report, these deliverables are attached as appendix.

All publishable exploitable project results intended for public dissemination are available via the internet.

They can be downloaded from http://www.swt-technologie.de/html/negst.html.

Diss. activity No[1]	Title of knowledge dissemination	Use of results	Delivery date [2]	Nature [3]	Target groups [4]	Diss. Level [5]
WP1.D1	Summary report on today's system technology	Overview of status and trends – to give basis for further work in the WP/project	6	R	PP, MA, EX	PU
WP1.D2	Report about theoretical system evaluation	Derive general recommendations for future system development	12	R	PP, MA, EX	PU
WP1.D3	Workshop with manufacturers	Dissemination of findings to industry at national workshops	18	O	MA	PU
WP1.D4	Design and installation guidelines for the new system generation	Co-ord. with WP4. Dissemination of guidelines to installers and manufacturers associations	18	R	PP, MA, IN	PU

[1] Deliverable numbers in order of delivery dates: D1 – Dn
[2] Month in which the deliverables will be available. Month 0 marking the start of the project, and all delivery dates being relative to this start date.
[3] Please indicate the nature of the deliverable using one of the following codes:
R = Report **P** = Prototype **D** = Demonstrator **O** = Other
[4] Target group categories:
PP = project participants **MA** = manufacturers of solar thermal products and other heating industry
IN = installers **PU** = public **EX** = all experts in the field
BI = building industry **AR** = architects **PL** = planners
IV = investors **OT** = others
[5] Please indicate the dissemination level using one of the following codes:
PU = Public
PP = Restricted to other programme participants (including the Commission Services).
RE = Restricted to a group specified by the consortium (including the Commission Services).
CO = Confidential, only for members of the consortium (including the Commission Services).

WP2.D1	Questionnaire concerning larger solar thermal systems	To gain knowledge on barriers for the dissemination of large ST systems	6	O	PP, BI, MA, PL, IN, OT	PU
WP2.D2	National workshops (3 to 4) with planners and building industry	Information and motivation on large ST systems for planners or representatives of building industry	Div	O	PP, PL, BI	PU
WP2.D3	Report concerning investigation and evaluation of existing financing models	Basis for further work	12	R	PP	PU
WP2.D4	Material for marketing SDHW systems to investors in the building industry	Support to the marketing of larger solar systems	18	O	MA, PL, IN, IV, BI	PU
WP2.D5	Technical and financial guidelines	Best practise and recommendations on standardised system concepts and financing models to be disseminated to target group	(18) 24	O	MA, IN, BI, IV, PL	PU
WP3.D1	Reports of meetings to bring together existing requirements and methods	Basis for further work	Div	R	PP	PU
WP3.D2	Overview of existing requirements in EU countries and directives	Basis for further work	12	R	PP	PU
WP3.D4	Workshop on integration of thermal solar functions into building components	Discussion of problems, solutions, state of the art, best practise	18	O	PP, EX, MA, PL, AR, BI	PU

WP3.D5	Recommendation of concepts for easy installation and integration in conventional heating appliances, and	Dialogue especially with the non-solar heating industry on integration of solar in conv. heating appliances	18	O	PP, EX, MA, BI	PU
WP4.D1	Meeting minutes and status reports of subtask meeting as a basis for the co-ordinators project reports	Internal meeting minutes and status reports on 9 subtasks	Div.	O	PP	PP
WP5.D1	Technical status report on solar desalination and solar cooling	Basis for further work	12	R	PP,	PU
WP5.D2	Report concerning the suitability of different collector technologies for solar cooling and solar desalination	For identification of the most promising technologies for solar cooling and solar desalination	18	R	PP, MA, EX	PU
WP6.D1	Consortium Agreement	Internal use	6	O	PP	PP
WP6.D2	Project presentation	Information about project	6	O	EX	PU
WP6.D3	Project website (http://www.swt-technologie.de/html/negst.html)	Project status, results and additional information will be available here.	Div	O	PP, PU	PU
WP6.D4	Two workshops will be arranged for the industry	Dissemination of project results to the European industry through ESTIF	18 / 30	O	MA, BI	PU
WP6.D5	Printed or electronic special publications	Dissemination of specific project results	Div	O	div	PU
WP6.D6	Interim report	Dissemination of project status	18	R	PP	PU

WP6.D7	Presentation(s) at European Solar Thermal Energy Conference estec2005	Dissemination of project results	18	O	EX, MA, BI, PL, AR, IV, PU	PU
WP6.D8	Special seminars focused on possible specific project results	Dissemination of specific project results	Div	O	div	PU
WP6.D9	Management reports	Information about project status	18	R	PP	PP

The Appendix to this report contains the following deliverables:

No	Title of Deliverable
WP1.D1	Summary report on today's system technology
WP1.D2	Report about theoretical system evaluation
WP1.D3	Workshop with manufacturers
WP2.D1	Questionnaire concerning larger solar thermal systems
WP2.D2	National workshops (3 to 4) with planners and building industry
WP2.D3	Report concerning investigation and evaluation of existing financing models
WP2.D4	Material for marketing SDHW systems to investors in the building industry
WP2.D5	Technical and financial guidelines
WP3.D1_2	Inventory of guidelines, Overview of existing requirements in EU countries and directives
WP3.D4	Workshop on integration of thermal solar functions into building components
WP3.D5	Recommendation of concepts for easy installation and integration in conventional heating appliances
WP4.D1	Meeting minutes and status reports of subtask meeting as a basis for the co-ordinators project reports
WP5.D1	Technical status report on solar desalination and solar cooling
WP5.D2	Report concerning the suitability of different collector technologies for solar cooling and solar desalination
WP6.D1	Consortium Agreement
WP6.D2	Project presentation
WP6.D3	Project website (http://www.swt-technologie.de/html/negst.html)
WP6.D4	Two workshops will be arranged for the industry
WP6.D5	Printed or electronic special publications
WP6.D6	Interim report
WP6.D7	Presentation(s) at European Solar Thermal Energy Conference estec2005
WP6.D8	Special seminars focused on possible specific project results
WP6.D9	Management reports