Project No.: TREN/04/FP6EN/S07.31155/503119

NEGST

New Generation of Solar Thermal Systems

Instrument: Coordination Action (CA)

Thematic Priority: PRIORITY 6-1: Sustainable energy systems
SUSTDEV-1.1.1, SUSTDEV-2002-6.1.3.1.1.2-4, SUSTDEV-1.2.6

Publishable final activity report

Period covered:
from 01.07.2004 to 30.06.2007

Date of preparation:
16.11.2007

Start date of project:
01.07.2004

Duration:
36 months

Project coordinator name:
Harald Drück

Revision:
final version (R0)

Project coordinator organisation name:
Universität Stuttgart
Institut für Thermodynamik und Wärmetechnik (ITW)

PUBLISHABLE FINAL ACTIVITY REPORT

1 PROJECT DESCRIPTION

The project NEGST aimed 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) were considered, as well as systems for solar cooling and sea water desalination.

The main instrument of the project was 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 was done in close cooperation with industry. The aim was 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 formed one important element of the project. These measures were 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 had a duration of 36 months. The project work was 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:

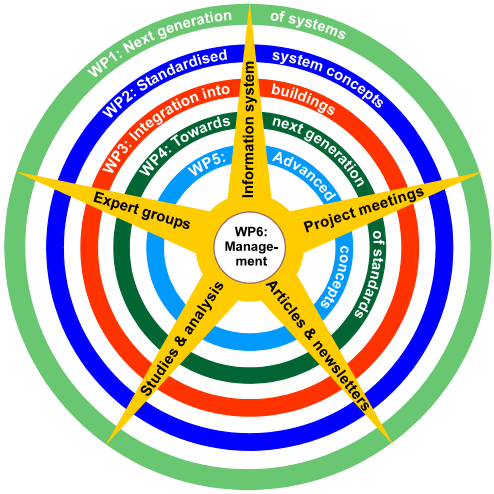

Figure 1: Project Structure of NEGST

Work package 1 aimed at the development of a new generation of solar thermal systems and their introduction to the market, whereas work package 2 dealt 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 were considered.

Work package 3 concerned 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 had the objective to carry out 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 concentrated on advanced applications like technologies of seawater desalination and cooling systems powered by solar thermal energy at low to medium temperatures.

Work package 6 comprised mainly project management, the co-ordination of the whole project in order to achieve the contractual obligations and expected results and the dissemination of the 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 were directly 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)

Responsible for the project co-ordination was Mr. Harald Drück, University of Stuttgart, project assistance: Elke Streicher, Institut für Thermodynamik und Wärmetechnik (ITW), Pfaffenwaldring 6, 70550 Stuttgart, Germany, Internet: www.itw.uni-stuttgart.de
phone: ++49(711)685-63553
e-mail: drueck@itw.uni-stuttgart.de

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 solar thermal technology.

2 WORK PERFORMED

WP1: Next generation of systems

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.

With the results of the market survey it was possible to group the different systems in system classes with similarities and the most promising system types of these classes with the highest impact on the market have been identified. Nine most promising system concepts have been selected and evaluated. The aspects included are:

- Cost and savings (installation; maintenance; performance and energy savings, including embodied energy; cost-performance ratio)
- Additional benefits (safety and health; range of application, extra function; environmental friendliness; aesthetics, building integration and space requirement; technical integration)
- Markets and marketing considerations (the potential to open up new and niche markets or expand existing markets).

For a further evaluation with regard to efficiency, ecological and installation aspects on site measurements were carried out at some of the systems.

WP2: Standardised system concepts

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 scale solar thermal systems were allocated and documented.

In the second reporting period national exemplary installations in 8 different countries (Austria, Germany, Greece, Netherlands, Norway, Spain, Sweden and Portugal) were analyzed and eight promising approaches for the standardisation of designing and integrating large solar thermal systems (LSTS) in various European countries were identified. By comparing various system concepts pre-fabricated components for large solar thermal installations were identified (pre-fabricated hydraulic units for different functions such as charging or discharging of the store, central DHW preparation units and units for heat distribution and heat transfer in the separate apartments). Within the technical investigations

experiences and recent developments on common monitoring methods and concepts for large solar thermal systems were collected.

WP3: Integration in buildings

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 180 regulations, guidelines and national standards concerning building integration from Austria, France, Germany, The Netherlands, Norway, Portugal and Sweden. Based on this inventory a survey among architects and planners was carried out to identify gaps in the building standards which are an obstacle for a widespread building integration of solar thermal collectors. The summary of the answers of the survey and discussions between the project participants lead to a report including recommendations for uniform European requirements of building integrated solar thermal collectors.

Good examples for integration of solar thermal systems in conventional heating systems both for single-family and multi-family buildings were collected. The examples show which style of solar thermal system allows simple integration into a given conventional heating system.

In order to show that solar thermal technology can be integrated in buildings also in a very aesthetic and attractive way, good integration examples were identified in the participating countries. The main criterion was an aesthetically pleasing integration from an architect's point of view. 6 buildings were chosen and the architect's were asked to provide a statement which was then printed in a brochure.

WP4: Towards the next generation of standards

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 m² 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.

Extensive work has been done by investigating gaps in existing standards and more than 30 documents representing proposals for new/revised test procedures and resource documents, giving a very good basis for future standardisation work have been produced.

WP5: Advanced applications

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.

A questionnaire was prepared and circulated among the NEGST participants and manufacturers working in the field under investigation in order to complete the background for the assessment of the suitability of the different collector types for solar cooling and solar desalination. From the delivered information different aspects have been evaluated and the results were summarized in a paper in which other significant aspects, such like the level of

interest in each technology, the barriers to its application, the cost-effectiveness, and the prospective of development are presented.

The implementation of a calculation tool for dimensioning solar heating and cooling systems is a key step towards the assessment of the most suitable solar thermal technologies for the air-conditioning of buildings. In this framework a novel design and simulation software has been developed which can be especially operated to perform feasibility studies.

Based upon the results achieved from of the first two deliverables of this workpackage, a limited number of solar cooling and solar desalination systems has been selected and a feasibility study was performed in order to assess the areas having the best potential with respect to the selected solar cooling and desalination systems.

WP6: Management and dissemination of project results

With regard to management activities this work package is related to the technical and administrative co-ordination of the project. This comprises especially the preparation and organisation of the project meetings (together with the local representatives), the chairing of the meeting as well as the preparation of the meeting minutes of the “general assembly” and the “steering committee”. In addition the financial administration of the project, reporting activities and the communication with the European Commission is subject of this work package.

Concerning the dissemination of the project results the main activity is related to the set-up and running of the project internet site: http://www.swt-technologie.de/html/negst.html
Furthermore press releases and newsletters were prepared and distributed.

3 EXPECTED RESULTS

As the overall objective of this project was 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 was collected and evaluated. Furthermore collected experiences were used to compile design and installation guidelines for the new system generation and were 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 formed a major part in this project. In addition, aspects related to the integration of solar thermal technology in the building envelope were 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 were also considered.

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

4 RESULTS ACHIEVED

All results originally planned in the contract have been achieved in the project. The main output is publicly available in the form of reports (deliverables). A list of deliverables is given in Section 3 of the final plan for using and disseminating the knowledge and the deliverables themselves are attached to the periodic activity reports of the 1st and 2nd reporting period as an appendix. Besides, all deliverables are available free of charge on the project website for download www.swt-technologie.de/html/negst.html.

In the following the results achieved within the different work packages are briefly described.

WP1: Next generation of systems

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). Afterwards 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 systems evaluated are very different. They range from integrated collector storage systems to complete solar combisystems and from ideas to (meanwhile) successfully marketed systems. However, there are specific features which are common to several of the systems. The features include:

- **Standardization** (create possibilities for larger production quantities. For example: a design that allows slight variations but has standardised core components; a design that can be successful in several markets; a modular design, which allows for larger production numbers of core components; or a concept with a large market potential). The objective is to lower product production cost.
- **Prefabrication** (design which allows as much factory assembly as possible). The objective is to reduce installation cost and effort, and to reduce the risk of improper installation.
- **Simplification** and reduction (improve the system in such a way that it requires a small number of components. To do this, several functions may have to be combined in one component). The objective is to reduce the cost for production or installation.
- **Adaptation** of an existing system concept to a new market or country by adaptation of components, optimization of sizing, etc. for the system to suit another climate or to be compatible with different standards or regulations.

The system concepts evaluated demonstrate that a generation of new systems is being studied, in development, in the process of market introduction or already successfully marketed, which is expected to have a significant effect on:

- the enhancement of solar thermal system technology and
- the positive development of solar thermal energy utilization.

The essence of these evaluations is described in a "Report about theoretical system evaluation" (Deliverable WP1.D2).

In addition some of the systems have been further evaluated on site. The results of this on-site evaluation with regard to efficiency, ecological and installation aspects as well as costs are described in Deliverable WP1.D5.

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.

WP2: Standardised system concepts

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 work package dedicated to collective solar thermal applications such as for multi-family houses or tourism facilities resulted in a number of resource documents on the technological and organizational state of affairs in Europe. On one hand the reports serve HVAC professionals with an overview on rewarded hydraulic design, recent innovations in component standardisation and concepts for plant supervision. To serve as benchmarks, promising standardised system solutions for large solar thermal systems that have proved their benefit on national markets in the last years have been analyzed for this target group. On the other hand, consultants and policy makers profit from the documentation of experiences on quality assurance and market enlargement. The provided report (Deliverable WP2.D5) includes a list of contact persons and publications for the respective issues and is meant to serve as a link to selected national and international expertise in the field of collective solar thermal applications.

WP3: Integration in buildings

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 180 existing requirements in EU countries and directives. The results of these investigations are described in the deliverable WP3.D1_2. Based on the results a report was elaborated on recommendations for uniform European requirements of building integrated solar thermal collectors (Deliverable WP3.D3).

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). Based on this report magazine articles showing the possibilities of integrating solar thermal into conventional heating systems were published in various magazines (deliverable WP3.D6).

Recommendations for the simplification of the installation process are given in a report (deliverable WP3.D7). It comprises good examples of easily installable products and highlights some aspects that installers have to pay attention to in order to avoid installation mistakes and malfunctioning of solar thermal systems.

A colourful brochure (deliverable WP3.D9) showing examples of building integration of solar thermal collectors was designed. Six objects from in project participating countries are presented in the booklet with the aim to illustrate how solar thermal collectors can be a part of

the building architecture and even give it an extra touch of sustainability, emphasizing the appearance of energy efficiency. The booklet was distributed among architects in Austria, Denmark, France, Germany, Italy, Norway, Sweden and The Netherlands with the goal to motivate them to apply solar thermal technology in buildings and to present creative solutions in existing applications. The booklet can be downloaded as a pdf-file, free of charge at http://www.swt-technologie.de/html/negst.html.

WP4: Towards the next generation of standards

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.

The following topics have been proposed to CEN TC312 for future standardisation activity:

a) clarification of the application of the present standards to tracking and/or concentrating collectors,
b) unglazed collectors: refined performance test conditions and prediction, improved sky temperature measurement,
c) collector components - requirements and test methods,
d) quality tests for evacuated tubes,
e) improved exposure - accelerated ageing test of collectors,
f) annual collector energy output.

Reference: CEN/TC 312 N 333 E, "Resolutions of the CEN/TC312 meeting in GRAN CANARIA, SPAIN, 2006-04-03 & 04 - RESOLUTION 10"

All activities concerning proposed standards procedures are described in detail in deliverable no. 2 of workpackage 4 (WP4.D2).

WP5: Advanced applications

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.

A feasibility study (deliverable WP5.D5) was carried out in order to identify the solar cooling and desalination technologies having the best potential of application in the different European regions. Based upon the results of the above-mentioned investigation and considering the fact that in most European areas cooling and heating are both needed, the techno-economic evaluation is performed on solar-assisted air-conditioning systems capable to fulfil both requirements. In particular, the study is limited to those cooling technologies that can be driven by low temperature collectors, such as single-effect H_2O/LiBr absorption chillers and desiccant and evaporative cooling systems. Since a good development outlook is

attributed to collectors for medium temperature applications, double-effect H_2O/LiBr and NH_3/H_2O absorption chillers are considered also.

Several case studies are taken into account for each selected solar cooling system according to both: type and location of application. The feasibility of each case study is expressed in terms of the solar collector area required to achieve a given overall primary energy saving with respect to the reference conventional cooling system, which is assumed as a compression heat pump with a typical heating/cooling COP.

The calculations are made by means of a suitable design software (deliverable WP5.D3) developed by ENEA, whose main characteristics are summarized below:

- annual solar fraction for heating and cooling is calculated starting from monthly-based average meteorological data and building loads (to be provided as input data)
- solar fraction for heating and cooling is calculated on a monthly basis by means of *PHIBAR-f Chart* method
- the solar thermal system is mainly characterized by the efficiency curve parameters of solar collector, the performance of the back-up unit, the main features of the solar tank and heat-exchanger
- the thermal air-conditioning system is characterized by its cooling COP (and heating if reversible) and its driving temperature (both assumed constant during the working period)
- the result is a curve which gives the variation, as a function of collectors area, of the primary energy saved with respect to a reference conventional vapour compression heat pump with a given heating/cooling COP.

WP6: Management and dissemination of project results

The management of the project was performed in such a way that the project was quite successful. All contractual project results have been achieved and even additional work was carried out and extra deliverables were produced. The participants of the project formed a quiet good team and during the entire duration of the project no major conflicts occurred.

The dissemination of the project results was mainly performed via the project internet website http://www.swt-technologie.de/html/negst.html.

This website is that often requested that entering NEGST into “google” leads at present (year 2007) directly to the NEGST project website.
In addition to electronic dissemination activities two press releases and four newsletters were prepared and distributed.

Furthermore articles informing about the NEGST project in general were launched in several magazines or conferences respectively (see also deliverable WP6.D5):

In order to disseminate the results of the NEGST project to all interested target groups a final project presentation workshop was organised at the Intersolar trade fair in Freiburg, Germany. This workshop entitled “New Generation of Solar Thermal Systems” took place on June 21, 2007 and was attended by 75 representatives from solar industry, research, building industry etc. (see deliverable WP6.D8 for more details).

5 INTENTIONS FOR USE AND IMPACT

One central aspect of this project was 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 was to provide the relevant information to these target groups. This was 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 the second project period the dissemination activities even were intensified and various workshops were held in every participating country. It is estimated that within the project duration more than 5000 people attended events with presentations related to NEGST.

In addition to these events, allowing a direct bidirectional communication the information about the existence of the project was spread by two press releases translated in 7 different European languages and by four project newsletters. The major aspect of these measures was 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, 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 will be intensified when the 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 the fourth project newsletter was prepared for the distribution at the Intersolar trade fair taking place at Freiburg, Germany in June 2007. Furthermore a final project workshop with 75 participants was held on this occasion in Freiburg. The dissemination of the project results will be performed by means of the deliverables compiled in the appendix of the periodic activity reports of the two reporting periods. The relevant deliverables will be available for download from the project web site free of charge at least up to the year 2012.

The most relevant result of the project is that it initiated the creation of a new, innovative-oriented atmosphere inside the solar thermal scene. Today solar thermal industry is much more research and development orientated as it was the case five years ago. This new mood is also reflected by the creation of the European Solar Thermal Technology Platform (ESTTP) that was launched in Spring 2006 at Brussels. The results achieved during the NEGST project also contributed to the elaboration of the "Solar Thermal Vision 2030"[1]. It is expected that many results of the NEGST project will be exploited during the further development of the "Solar Thermal Vision 2030" and the elaboration of a strategic research agenda that is required in order to implement the vision.

Finally it can be concluded that within the NEGST project a large number of deliverables were prepared and important measures and actions were initiated in order to strengthen and extend the position of solar thermal technology in a future energy market.

[1] "Solar Thermal Vision 2030 – Vision for the usage and status of solar thermal energy technology in Europe and the corresponding research topic to make the vision reality".
This document is available at: http://esttp.org/cms/upload/pdf/Solar_Thermal_Vision_2030_060530.pdf
For more information about the European Solar Thermal Technology Platform (ESST) see: www.esttp.org

APPENDIX - OVERVIEW OF AVAILABLE DELIVERABLES

The following deliverables are available on the NEGST project website in section "Reports and Public Deliverables": http://www.swt-technologie.de/html/negst.html

Appendix: Overview on available 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
WP1.D4	Design and installation guidelines for the new system generation
WP1.D5	Results of the on-site evaluation of the new system generation
WP1.F1	Experiences from the installation and the operation of the new system generation: solar system concept with water filled collector loop
WP1.F2	Experiences from the installation and the operation of the new system generation: compact heating unit for solar domestic hot water (SDHW) preparation
WP2.D1	Questionnaire concerning larger solar thermal systems
WP2.D2	National workshops on solar heating systems for larger buildings
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	Report on technical investigations on large solar thermal systems
WP2.D6	Presentations and publications
WP3.D1_2	Inventory of guidelines, Overview of existing requirements in EU countries and directives
WP3.D3	Recommendations for uniform European requirements for building integration of solar thermal collectors
WP3.D4	Workshops on integration of solar thermal functions into building components
WP3.D5	Recommendation of concepts for easy installation and integration in conventional heating appliances
WP3.D6	Integration of solar thermal components in conventional and other installations - articles in dedicated magazines for solar industry
WP3.D7/D8	Recommendations easily installable products

No	Title of Deliverable
WP3.D8	Articles in dedicated magazines for solar industry: simplification of the installation process
WP3.D9	Examples of successful aesthetic integration
WP3.D10	Dissemination to architects' magazines
WP4.D1	Meeting minutes and status reports of subtask meeting as a basis for the co-ordinators project reports
WP4.D2	Draft documents on proposed standards procedures
WP4.D3	Official proposals to CEN TC312 and WGs
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
WP5.D3	Design- and simulation software
WP5.D4	Workshop on solar cooling and solar desalination
WP5.D5	Feasibility study in order to identify the potential areas for these applications
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
WP6.D10	Final plan for using and dissemination knowledge
WP6.D11	Final report
WP6.Gender.D1	Gender Flyer