



## **TASK 54**

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# **PRICE REDUCTION OF SOLAR THERMAL SYSTEMS**

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**ANNEX**

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## Annex 54

# PRICE REDUCTION OF SOLAR THERMAL SYSTEMS

### 1. Definitions

#### *(a) Description of Technical Sector*

This Task aims at the purchase price reduction for end-users of installed solar thermal systems by evaluating and developing sustainable means to reduce production and/or installation costs on material, sub-component, system-component and system level. Special emphasis is placed on the identification and reduction of post-production cost drivers, e.g. channels of distribution. An extensive market research and the definition of reference systems, cost analyses, and the study of socio-political boundary conditions for solar thermal prices in selected regions will provide the basis for the evaluation of cost-structures and the cost reduction potential..

#### *(b) Definitions*

The scope of the Task is on solar thermal systems for converting the solar radiation into heat including their components (e.g. storage tank, collector), sub-components (e.g. absorber, framing, connectors) and materials. Special attention will be paid to non-technical costs like distribution, sales, installation, operation and maintenance costs.

## 2. Purpose and Objectives

A wider market penetration by solar thermal systems is prevented by the constantly high price levels in spite of reduced technical production costs. An appreciable price reduction requires primarily the decrease of the non-technical costs.

A reduction of the purchase price up to 40% contrasted to the applied reference systems shall be achieved by:

- Simplified system designs
- Less but innovative and cost-efficient materials
- Standardized components (e.g., collector, storage tank), subcomponents (e.g., connectors, casing parts) and installation
- Low production costs
- Plug & play systems for a simplified installation
- Reduced maintenance and operation costs

## 3. Activities

### (a) *Main Activities*

A cost analysis of existing reference systems for various applications will result in the benchmark for innovative systems designed for easy to install and integrate with innovative, pre-standardised sub-components from low-cost production with innovative, cost effective materials.

Additionally, ways to make solar thermal more attractive through improved marketing and consumer-oriented design will be explored. The research activities shall be specifically targeted at the needs and potentials of different markets and offer tailored solutions for affordable solar thermal systems at a competitive price.

### (b) *Sub-activities*

The activities will be performed in four Subtasks:

#### Subtask A: Market success factors and cost analysis

- A.1: Definition of solar thermal and conventional reference systems:
- A.2: Cost analysis of non-technical post-production cost drivers for reference systems
- A.3: Comprehensive cost-analysis (cradle-to-grave) for reference systems
- A.4: Cost analysis of non-technical post-production cost drivers for optimized systems
- A.5: Comprehensive cost-analysis (cradle-to-grave) for optimized systems
- A.6: Political, legal and social boundary conditions
- A.7: Market success factors

#### Subtask B: System design, installation, operation and maintenance

- B.1: Definition of standardised components
- B.2: Manufacturing costs
- B.3: Technical after sales costs

- B.4: Cost optimization of reference systems
- B.5: New proposals for a 40% price reduction

Subtask C: Cost-efficient materials, production processes and components

- C.1: Identification of major cost drivers
- C.2: Material substitution and functional integration
- C.3: Innovative, cost-efficient processes and components

Subtask D: Information, dissemination and stakeholder involvement

- D.1: Industry liaison
- D.2: Dissemination and information

(c) *Publications/Newsletters*

The overall scope and objectives of the Task and the different Subtasks will be described on the SHC website. Apart from publications of scientific results in conferences, journals and magazines, printed leaflets will be distributed to describe to scope of the Task.

#### **4. Expected Results/Deliverables**

The deliverables, allocated to the four Subtasks, will be:

Subtask A: Market success factors and cost analysis

- A. 1 List of reference systems and their specification
- A.2 Report on non-technical post-production costs for reference systems
- A.3 Report on cost structure for reference systems
- A.4 Report on non-technical post-production costs for optimized systems
- A.5 Report on cost structure for reference systems
- A.6 Report on the impact of political, legal and social boundary conditions
- A.7 Catalogue of best practices for marketing solar thermal

Subtask B: System design, installation, operation and maintenance

- B.1 Potential cost savings by use of standardised. Components
- B.2 Report on the cost analysis for purchase and manufacturing costs for the reference systems
- B.3 Report on cost analysis for installation, operation and maintenance for the reference systems
- B.4 Report on cost optimization of reference systems and technical after sales costs
- B.5 Report on new proposals for a 40% price reduction

Subtask C: Cost-efficient materials, production processes and components

- C.1 Report on cost reduction methods in other industries
- C.2 Report on cost drivers and selected components and materials for optimization
- C.3 Cost assessment for optimized components and materials
- C.4 Report on testing and qualification methods (material level)
- C.5 Report on multifunctional hybrid materials
- C.6 Report on testing and pre-qualification methods for components of solar thermal systems

C.7 Report on the potential of design of less expensive components

Subtask D: Information, dissemination and stakeholder involvement

- D.1 Workshop with invited industrial partners to assess the needs of the involved industry and to identify reference systems in Subtask A (gain and select input for Subtask A)
- D.2 National dissemination workshop by Task partner(s)
- D.3 Marketing workshop (in collaboration with Subtask A)
- D.4 Workshop for exploitation and dissemination
- D.5 Public website and press release
- D.6 e-Newsletter
- D.7 Publications (reviewed journals, online, conferences, etc.)
- D.8 Final publication

**5. Rights and Obligations of Participants**

In addition to the obligations enumerated in Article 4 of this Agreement

(a) Each participating institution/company shall provide the Operating Agent with detailed reports on the results of the work carried out for each Subtask;

(b) Each participating institution/company shall collect, assess and report to the Operating Agent data on solar heating systems for industrial applications in his country; and

(c) Each participating institution/company shall participate in the editing and reviewing of draft reports of the Task and Subtasks.

(d) *Operating Agent Meetings*

Each country/sponsor will bear the costs of its own participation in the Task, including necessary travel costs. The cost of organising meetings will be borne by the host country.

(e) *Individual Financial Obligations*

Aside from providing the resources required for performing the work of the Subtasks in which they are participating, all Participants are required to commit the resources necessary for activities that are specifically collaborative in nature and that would not be part of activities funded by national or international sources. Examples include the preparation for and participation in Task meetings, co-ordination with Subtask Participants, contribution to the documentation and dissemination work and Task related R&D work which exceeds the R&D work carried out in the framework of the national (or international) activity.

(f) *Task-Sharing Requirements*

The Participants agree on the following funding commitments:

- 1) Each Participant (country/sponsor) will contribute to this Task a minimum of 1-person year per year of the Task (i.e., a total minimum of 3 person years). This means that each participating institution/company shall commit to the Task a minimum of 4-person -months per year of the Task.
- 2) Participation in the Task requires participation in at least one of the Subtasks.

- 3) The Operating Agent will contribute with a minimum of 4-person month per year to the Task plus 4 months after official end for reporting (i.e., a total of 1.3 person years for his/her work as Operating Agent).
- 4) The Subtask leaders shall commit a minimum of 3 person-month per year for the work.
- 5) Participation may partly involve funding already allocated to a national (or international) activity that is substantially in agreement with the scope of work outlined in this Annex. Aside from providing the resources required for performing the work of the Subtasks in which they are participating, all Participants are required to commit the resources necessary for activities that are specifically collaborative in nature and that would not be part of activities funded by national or international sources. Examples include the preparation for and participation in Task meetings, co-ordination with Subtask Participants, contribution to the documentation and dissemination work and Task related R&D work which exceeds the R&D work carried out in the framework of the national (or international) activity.
- 6) The level of effort to be contributed by each country/sponsor will be specified in a "Letter of National Participation" which is signed by the Operating Agent and the Executive Committee representative within 3 months from the start date of the Task.

## **6. Management**

(a) The Federal Republic of Germany, acting through the Fraunhofer Institute for Solar Energy Systems, is designated as Operating Agent.

(b) The Operating Agent's rights, obligations and responsibilities in addition to those indicated in the main body of the Implementing Agreement and the organisation of the work under this Annex enumerated in Articles 5 of this Agreement, the Operating Agent shall:

- 1) Prepare and distribute the results mentioned in paragraph 4 above.
- 2) Prepare joint assessments of research, development and demonstration priorities for solar heating systems for industrial processes.
- 3) At the request of the Executive Committee, organize workshops, seminars, conferences and other meetings.
- 4) Prepare the detailed Program of Work for the Task in consultation with the Subtask Leaders and the Participants and submit the Program of Work for approval to the Executive Committees of the Solar Heating and Cooling Programme.
- 5) Propose and maintain a methodology and a format for the submission of information on solar heating systems for industrial processes which is collected by the Participants as described in paragraphs 3 and 4 above.
- 6) Provide reports semi-annually to the Executive Committees on the progress and the results of the work performed under the Programme of Work.
- 7) Provide to the Executive Committees, within six months after completion of all work under the Task, a final report for its approval.
- 8) In co-ordination with the Participants, use its best efforts to avoid duplication with activities of other related programmes and projects

- implemented by or under the auspices of the Agency or by other competent bodies.
- 9) Provide the Participants with the necessary guidelines for the work they carry out with minimum duplication.
  - 10) Perform such additional services and actions as may be decided by the Executive Committees, acting by unanimity.
  - 11) Gather documents from Subtask Leaders, edit and distribute the output of the Task either as a printed handbook, electronically or on the SHC website.
  - 12) A Subtask Leader for each of the foregoing Subtasks will:
    - a. Co-ordinate the work performed under that Subtask;
    - b. Assist the Operating Agent in preparing the detailed Programme of Work;
    - c. Direct technical workshops and provide the Operating Agent with written summaries of workshops results;
    - d. Edit technical reports resulting from the Subtask and organise their publication; and
    - e. Subtask leaders may arrange meetings in between or in association with Experts meetings of the Task.
  - 13) The Subtask Leaders shall be a Participant that provides to the Subtask a high level of expertise and undertakes substantial research and development in the field of the Subtask. The Subtask Leaders shall be proposed by the Operating Agent and designated by the Executive Committee, acting by unanimity of the Participants. Changes in the Subtask Leaders may be agreed by the Executive Committee, acting by unanimity of the Participants.
- (c) *Operating Agent's Meetings:* There will be Experts meetings of the Task at intervals of approximately 6 months. Subtask Leaders may arrange meetings in between or in association with Experts meetings of the Task. Attendance at the Experts Meetings of the Task will be mandatory.
- (d) It is intended to organize expert/industry workshops every year, directly linked to Task meetings. The overall scope and objectives of the Task and the different Subtasks will be described on the SHC website. The server should be able to process an automatically distributed electronic newsletter.

Apart from publications of scientific results in conferences, journals and magazines we would like to distribute printed leaflets to describe to scope of the Task. Similarly there is a recognized need to process information from worldwide stakeholders also outside the SHC Task, and to start educational missions to relevant countries in the developing and developed world.

## **7. Admission, Participation and Withdrawal of Participants**

In addition to the specific obligations, the Operating Agent will produce, promote and distribute the results of the Task. The Participants will support these activities by contributing respective papers and by dissemination activities financed by the individual Participants.

## **8. Information and Intellectual Property**

For purposes of this Annex, in case of conflict with the provisions of the Agreement, the following provisions shall prevail:

- a) For arising information regarding inventions the following rules shall apply:
  - 1) Arising information regarding inventions shall be owned in all countries by the inventing Participant. The inventing Participant shall promptly identify and report to the Executive Committee any such information along with an indication whether and in which countries the inventing Participant intends to file patent applications, and
  - 2) Information regarding inventions on which the inventing Participant intends to obtain a patent protection shall not be published or publicly disclosed by the Operating Agent or the other Participants until a patent has been filed, provided, however, that this restriction on publication or disclosure shall not extend beyond twelve months from the date of reporting of the invention. It shall be the responsibility of the inventing Participants to appropriately mark Task reports that disclose inventions that have not been appropriately protected by filing a patent application.
  
- (b) The inventing Participant shall license proprietary information arising from the Task for non-exclusive use as follows:
  - 1) To Participants in the Task:
    - a. On the most favourable terms and conditions for use by the participants in their own country; and
    - b. On favourable terms and conditions for the purpose of sub-licensing others for use in their own country.
  - 2) Subject to sub-paragraph above, to each participant in the Task for use in all countries, on reasonable terms and conditions; and
  - 3) To the government of any Agency Member country and nationals designated by it, for use in such country in order to meet its energy needs.

Royalties, if any, under licenses pursuant to this paragraph shall be the property of the inventing Participant.

## **9. Entry into Force, Term and Extension**

This Annex shall enter into force on 1<sup>st</sup> October 2015 upon the date the IEA Executive Director received the second Notice of Participation, and shall remain in force for a period of 3 years/until 30<sup>th</sup> of September 2018. At the conclusion of that period, this Annex can be extended by at least two Participants, acting in the Executive Committee, for a period to be determined at that time, provided that in no event shall the Annex continue beyond the current term, or actual termination, of the Implementing Agreement.