

WP 4. Towards the next generation of standards

Work package No.: WP 4	Starting month: 0												
Work package title: Integration in buildings Towards the next generation of standards													
Activity Type ¹ : Coordination activities													
	Leader	Other partners with major involvement											
Partner No.:	7	1	2	3	4	5	6	8	9	10	11	14	18
Person-months per partner:	4.7 *	7.5	1.4	1.2	1.4	6.0	0.9	3.5	4.7	0.9	0.9	0.0	4.6
	4.6 *	3.8**					3.5		2.6			0.3	

* additional external support equivalent to ~~3.4~~ 2.6 person month by Jan Erik Nielsen

** additional external support equivalent to ~~2.6~~ 3.4 person month by Harald Drück

WP 4: Objectives

The objective of this WP is to continue and complete pre-normative work for a next generation of solar thermal systems and components based on the priorities to be agreed upon in the project.

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.

¹ For Coordination Actions each work package must relate to one (and only one) of the following three possible Activity Types: Coordination activities, Training activities, Management activities.

WP 4: Description of work

4.0. Introduction:

It has been decided to focus in this co-ordination action on pre-standardisation work which is required as a basis for a new generation of solar thermal systems and components. Work directly related to the improvement and revision of already existing standards will be covered by a future proposal from the European Solar Industry Federation (ESIF) to the "Intelligent Energy for Europe"/"ALTENER" programme.

The expert group - formed for this work package - will use the participants' insight in front-end developments and the analysis from WP1 (on the state of the art of existing new/advanced systems, components and applications) to determine the needs for new standards to be developed / existing standards to be expanded. At this moment it is foreseen that work will focus on the following fields²:

- advanced collectors
- advanced stores
- advanced controllers
- combisystems
- solar cooling
- combination of solar thermal and heat pump technology
- solar desalination
- fluids
- LCA (Life Cycle Assessment)
- building integration (due to the extensive work foreseen, this topic will be treated separately in WP3)

It is intended that this co-ordination actions also acts as a platform for fruitful discussions on priorities for future standards between the involved researchers and industry representatives.

The general nature of work in this work package will be 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

Within the different fields it is intended to treat the following topics:

² But it should be accepted to adjust focus according to potential new developments during the projects

4.1. Advanced collectors

- Air collectors could in some cases (e. g. space heating or cooling) be much more cost effective than liquid collectors. The existing EN standards for collectors do not include air collectors, however it is possible to built on work done in ISO years ago.
- Common European standards on components of collectors (e.g. selective surfaces, transparent insulation, reflectors and new generation materials) will help product development and quality management in the production line and might be included in existing standards to increase quality information.
- Adaptation of the existing standards to fixed mounted concentrating collectors of the CPC type for medium temperatures, specially designed for cooling systems.
- Combined solar thermal and PV collectors. First series have been produced, but there is no test procedure to characterise them.
- Unglazed collectors provide one of the most cost efficient applications today but experience from their characterisation according to already existing standards are scarce, partly because testing is extensive and thus expensive.

4.2 Advanced stores

- High performance stratified stores. A simple method to evaluate the very important degree of stratification could decrease the costs of future tank tests.
- Latent heat stores. Standardised performance and durability test methods are needed.
- Chemical stores. Standardised performance and durability test methods are needed. Focus also on safety requirements
- “Intelligent” stores. As an example stores with variable auxiliary volume are on their way to the market – and the existing ENV³ for tanks is not able to evaluate the enhanced performance of such stores, so despite this store type is potentially very competitive, it will have difficulties to penetrate the market
- Low cost heat stores may require adaptation of available standards. Aspects are material use, water tightness, heat losses, possible large store volumes, modular character, etc.

³ An **ENV** is a pre-standard and has a validity of 3 years. Afterwards, it can be replaced by a regular standard or its validity as a pre-standard can be prolonged. In general it can be said that regulations remain pre-standards if the included test procedures are still in the testing phase or if it is necessary to gain more experience with these procedures.

4.3. Controllers & pumps:

- Advanced controllers. Variable flow, fixed outlet temperature, “intelligence”: Automatic user behaviour dependent control. Pump/controller integration. Common performance test procedures not yet established.
- PV-driven pumps. For sure a product of the future. Common test methods are missing.
- Integrated controlling/monitoring. Checking simple monitoring devices could be very relevant in connection with “Green Thermal Certificates”
- Development of test methods for the evaluation of the energy consumption of pumps and controllers.

4.4 Combisystems

- Pre-standardisation work on solar combisystems has been started in IEA Task 26 (www.iea-shc.org/task26/) and the EU-ALTENER Solar Combi system project (<http://www.ellekilde.dk/altener-combi/index.htm>). To develop standards – and to keep them simple - is a difficult matter because of the large number of variable designs. But the existing work gives a really good basis for developing in this project the first drafts of standards for combisystems. Main participants from the above mentioned projects will participate in this work to secure the continuation of the work.
- Integrated systems: burner integrated directly in solar tank. Systems are on the market but standardised methods for evaluating the performance are needed.
- Testers will find in this co-ordination action a platform to discuss test methods in order to bring test procedures under development to such a high level, that they can be present as work items to CEN TC312.

4.5 Solar cooling

- Solar cooling has a tremendous potential, and development is taking off at the moment. Standards for requirements and test methods will soon be urgently needed
- Close co-operation with IEA SH&C Task 25 (Solar assisted air-conditioning of buildings, <http://www.iea-shc-task25.org>) in order to establish a common test methodology

4.6 Combination of solar thermal and heat pump technology

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4.67 Solar desalination

- Solar desalination has as well a large potential e. g. on the Mediterranean islands, and development is taking off at the moment. Standards for requirements and test methods will soon be urgently needed.

4.78 Fluids

- No standards for anti-freeze fluids for solar thermal systems are existing. For many years the only method for choosing solar fluids has been the “trial an error” method – by nature involving “errors” such as corrosion and blockage of components. Standards are needed in order to be able to put requirements on fluids and to secure a long life-time. Furthermore test methods which are able to differentiate the quality of different fluids are needed.
- Environmental issues will be included in the work and output will be passed on to 4.8.

4.89 LCA (Life Cycle Assessment)

- Several countries have already made or are making national procedures for evaluating the environmental Life Cycle Assessment of solar thermal systems. The task here is to co-ordinate these procedures in order to reach a common European procedure.
- In order to evaluate the environmental performance of solar thermal systems there is a need for a uniform and simple method, including a limited database for calculating the energy payback, i.e. the energy used for producing the solar thermal product, in comparison with the energy produced by it during its lifetime. At the same time there is a need for a harmonised method for calculating the environmental impact avoided by the use of solar thermal products in comparison with conventional heating systems during the lifetime of operation. It is important to declare the environmental benefit for decision-makers (house owners, builders etc.) in an independently and uniform way in order to convince them to invest in the solar techniques. With this new method it will be possible to rank different systems according to “environmental performance”, which is an important base for future environmental labelling of solar thermal products. Here special consideration is needed for showing the environmental benefits with solar thermal products that can replace other energy sources in high temperature applications.

4.910 Dissemination and interaction with industry

The WP4 co-ordinator – European Solar Industry Federation, ESIF - is by nature continuously in very close contact with the European solar thermal industries. This will secure that the basis for the next generation of solar thermal standards will represent the needs and wishes of the industry to have an enlarged and open market for high quality solar thermal products.

ESIF is by liaison with CEN involved in the ongoing standardisation work and represented in TC312 and all TC312 working groups (WG's).

- ESIF will present status and results from the project to TC312 and WG's meetings and will together with the other participants (almost all of them are present in TC312 and/or WG's) bring inputs from TC312 and WGs into the project in order to ensure a continuous information exchange.

WP 4: Deliverables

Within each of the nine subtasks described above the following output will be produced:

- WP4.D1 Meeting minutes and status reports of subtask meeting as a basis for the coordinators project reports
- WP4.D2 Draft documents on proposed standard procedures: Proposal for extension of existing standards to include next generation product; Proposal for new standard procedures for new products and applications
- WP4.D3 Official proposals to CEN TC312 and WG's to take on standardisation work

WP 4: Milestones⁴ and expected results

- WP4.M1 Agreement on focus areas and a more detailed work plan (kick-off meeting)
- WP4.M2 Final list of documents and procedures to be produced (month 6)
- WP4.M3 Status report; fine-adjustment of working plan (month 12)
- WP4.M4 Decision on which procedures shall be proposed to CEN TC312 and which will need more elaboration to reach standardisation stage (month 18)

⁴ Milestones are points where major results have successfully been achieved as the basis for the next phase of work, or which serve as control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.