Project Fact Sheet

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Identification of most promising markets and promotion of standardised system configurations for the market entry of small scale combined solar heating & cooling applications (SOLAR COMBI+)

Programme area:	VKA7 (ALTENER), small scale renewable energy sources applications
Status:	ongoing
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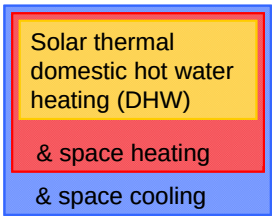
Partners:	Centre for Renewable Energy Sources (CRES), Greece Fraunhofer Gesellschaft zu Förderung angewandter Forschung e.V. – Institut für Solare Energiesysteme, Germany Arbeitsgemeinschaft Erneuerbare Energie – Institut für Nachhaltige Technologien (AEE INTEC), Austria Università degli Studi di Bergamo, Italy TECSOL SA, France Ikerlan Technological Research Centre, Spain Fagor Electrodomésticos, S.Coop, Spain ClimateWell AB, Sweden SorTech AG, Germany Solution Solartechnik GmbH, Austria SK Sonnenklima GmbH, Germany
Website:	Not yet available
Objective:	Identify and promote standard system configurations for small scale solar heating and cooling applications
Benefits:	Enhance smooth market entry of small scale sorption chillers, where several European enterprises are taking over worldwide leadership
Keywords:	Combined solar heating & cooling, standardised systems, small scale applications
Duration:	09/2007 – 02/2010
Budget:	€ 969'501 (EU contribution: 50%)
Contract number:	EIE/07/158/SI2.466793

solarcombi+



Short description

The aim of this project is to take newly commercially available small scale sorption chillers and identify and promote standardised Solar Combi+ systems for small applications: i.e. combined solar water and space heating and cooling up to a cooling load of 20 kW. Accelerating and smoothing the market entry of small scale Solar Combi+, the project will contribute to achieving energy policy goals of the EU and supports the market entry of a technology where a group of European enterprises has a favourable starting point for international leadership.

To identify the above mentioned standard system configurations and most promising applications, the project proposes to perform virtual case studies, where promising system configurations are defined (based on a thorough analysis of the market) and validated by simulations and economical and ecological ratings for different typical conditions (i.e. utilization, climate, building type).

Expected and/or achieved results

- **Standard system configurations** for Solar Combi+ systems**,** which work best under different circumstances, help to avoid the high effort in design stage, which is not affordable for small applications.
- **Package solutions** for the single technologies are developed by the participating small scale sorption chiller producers; respective training for solar thermal enterprises and installers is offered.
- **Most Promising Markets** are identified (in the sense of application type, but also climatic circumstances etc.) and promoted, inter alia with media campaigns in promising regions.
- **Knowledge among professionals** about feasibility and opportunities of Solar Combi+ systems is enhanced by presenting results both at conferences, in professional's magazines and in occasion of regular meetings of interest groups and associations.
- **Awareness within public authorities** about the potential of Solar Combi+ aiming at targeted support programmes and consideration within the implementation of EPBD (European directive on Energy Performance in Buildings).

Lessons learnt

- Definition of Standard Systems Configurations on international level is quite complex, since; (i) "typical" applications and solutions on hydraulic level are quite different; (ii) national regulations are different and sometimes even quite contradictory. E.g. the regulation on Solar Thermal Systems in Spain strictly forbids to heat the solar tank with a back-up heater, an approach used throughout the rest of Europe, with good performance results for well dimensioned systems; this leads to unnecessarily complex hydraulic schemes and impedes potential solutions.
- Well-sized systems have a collector size of about 3.5 to 5 m²/kW reference chilling capacity and a hot storage volume of 50 to 75 l/m² collector aperture area. If the system is dimensioned according to this rule of thumb, high total solar fractions can be obtained and the system operates close to the optimum in terms of primary energy savings and the costs of these primary energy savings. The control strategy influences the performance of the system considerably in terms of both solar fractions and primary energy consumption. That means that an individual adaptation of the system control to the chiller as a function of location, application and configuration offers significant potential for improvement. Especially the control of pumps and heat rejection fan must be carefully defined.
- Systems' costs are significantly higher than standard cooling appliances. The production numbers have to considerably increase in order to achieve the cost-competitiveness of a conventional system; for this purpose the definition of chiller dependent package solutions that are based on standard configurations might reduce the long-run production costs. At the same time dedicated incentives' schemes, promoting the installation of well-designed systems (therefore well-performing systems), have to be introduced ad EU, national and local level, to accompany the market entry of the solar heating and cooling technology.