




<p align="center">HIGH SOLAR FRACTION HEATING AND COOLING SYSTEMS WITH COMBINATION OF INNOVATIVE COMPONENTS & METHODS</p>	<p>Contract No: TREN/07/FP6E N/S07.68923/0 38659 HIGH-COMBI</p>	<p align="center">1st E-Letter</p> <p align="center">Updated: 14/7/2008</p>
		<p>Programme: DG TREN EUROPEAN COMMISSION</p>
<p>Project Coordinator: CRES</p> <p>Project duration: 01/06/07 - 31/05/11 Period of project: 01/06/07 - 30/06/08</p>	<p>Contact Info: Dr. Aris Aidonis</p> <p>Tel.: +30-210-6603284 Fax: +30-210-6603301 Email: aidonis@cres.gr</p> <div>  <p>Centre for Renewable Energy Sources</p> </div>	
<p>Aim of the project</p>		
	<p>The project aims at developing high solar fraction systems by innovative combination of optimized solar heating, cooling and storage technologies. Demonstration plants will be constructed (in Greece, Italy, Austria and Spain) using different technologies, components and control strategies in order to achieve high solar fraction values. Innovative techniques, components and/or configurations will be examined (new storages, use of rejected heat during cooling, combined heating and cooling control). Demonstration plants' monitoring data will be analyzed, the simulation and design tools validated and the performance of the plants evaluated. Market analysis will be carried out in order to estimate the</p>	

	potential penetration for these systems in the European heating and cooling market.																																										
Potential end-users	Greece, Italy, Spain and Austria are the countries in which implementation is concerned. The sectors of the implementation are all medium and large buildings having heating and cooling loads along the year. A survey on end users has resulted into the identification of the following in each country: a residence in Corfu and the Province of Milan, a social housing building in Spain and administration buildings in Gleisdorf, Austria																																										
Pilot Plants’ state of progress	<table> <thead> <tr> <th>Plant:</th> <th>GR</th> <th>IT</th> <th>ES</th> <th>AT1</th> <th>AT2</th> </tr> </thead> <tbody> <tr> <td>Design</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Manufacturing</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Erection</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Commissioning</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Monitoring</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Completed</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>	Plant:	GR	IT	ES	AT1	AT2	Design	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Manufacturing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Erection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Commissioning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Monitoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Completed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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References	Knowledge and pre-existing know how of partners is being supported by the use of TRNSYS system simulations and the work of IEA SHC Task 32 “Thermal energy storage for solar and low energy buildings” and IEA SHC Task 38 “Solar Air-Conditioning and Refrigeration”, which are used as references.																																										
Progress of the Project																																											
End user identification	A Report with the building types, energy consumption patterns and climates of the countries where the end-users will be located has been prepared. Three types of buildings (“Residential Buildings”, “Office Buildings” and “Tourist Applications”) are addressed. Data have turned out to be quite differing between countries and therefore the “Thermal Energy Saving Measures” recommended to be considered prior to the installation of any active heating and cooling system in a building are quite country-specific.																																										
State of the art	State of the art of similar high-combi applications has been identified. There is no standardised configuration available on																																										

	the market.
Demo plant concept	Identification of concepts for the demo plants is at a preliminary point.
Laboratory Tests 	<p>Laboratory tests in order to test the thermal conductivity of waste material as low cost insulation material is in progress, about 70% of the projected work is completed. Tests were made on Bubble Wrapping, Empty plastic bottles with perlite and chipped tyres.</p> <p>Tests on chipped tyres gave the best results.</p>
Simulation method	<p>A model is being built in order to calculate energy demands within the four end users-building's. METEONORM Version 5.0 the global meteorological database for applied climatology is being used. For generating heating/cooling demand files the simulator routine TRNSYS 16.1 was used. Results of the dynamic building simulation are exact time-dependent sensible and latent building load tables of the procedures in a building as a function of the external climate, the user profile, the building construction and the technical building equipment. The building and the generation system were split due to the necessity to realise sensitivity analysis over a great amount of parameters on the heat/cold generation side and therefore to avoid huge calculation time and convergence problems.</p>
Dissemination	<p>The project's web site [http://www.highcombi.eu] is on line and being regularly updated. A private area of the website serves as an interactive platform among partners of the project.</p> <p>There is no published Literature yet.</p>