


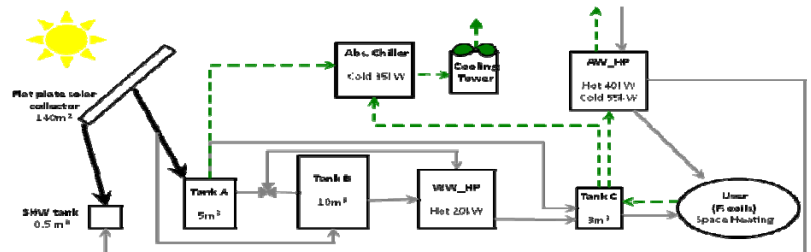
<p align="center">HIGH SOLAR FRACTION HEATING AND COOLING SYSTEMS WITH COMBINATION OF INNOVATIVE COMPONENTS & METHODS</p>	<p>Contract No: TREN/07/FP6E N/S07.68923/0 38659 HIGH-COMBI</p>	<p align="center">3rd E-Letter</p> <p align="center">Updated: 02/06/2011</p>
		<p>Programme: DG TREN EUROPEAN COMMISSION</p>
<p>Project Coordinator: CRES</p> <p>Project duration: 01/06/07 - 31/12/11</p>	<p>Contact Info: Dr. C Karytsas</p> <p>Tel.: +30-210-6603375 Fax: +30-210-6603301 Email: kkari@cres.gr</p>  <p>Centre for Renewable Energy Sources</p>	
<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 are 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 are examined (new storages, use of rejected heat during cooling, combined heating and cooling control).</p> <p>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</p>	

	order to estimate the potential penetration for these systems in the European heating and cooling market.																																																	
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> <th>AT3</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 checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Manufacturing</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Installation</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Commissioning</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" 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 checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" 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 checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> </tbody> </table>	Plant:	GR	IT	ES	AT1	AT2	AT3	Design	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Manufacturing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Installation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Commissioning	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Monitoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Completed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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Progress of the Project																																																		
Greek Plant construction	<p>The construction of the Greek Demo plant is almost completed. All the hydraulic work has been completed and the construction and installation of the control and monitoring equipment is on its way. The expected date of completion is end of June and all the operation test and final commissioning should be completed by 15th of July 2011.</p> 																																																	



Italian Plant construction

The renovation of the building is almost completed, allowing for the installation of the Italian Demo Plant. The construction of the machinery room is on its way and the installation of the solar panels will start soon. The plant is expected to be completed by the end of June 2011





Spanish Plant construction

The construction of the residential part of the building is almost completed alongside with the completion of the solar cooling plant. The collector field and the distribution system is completed and the machinery room is under construction. The system is expected to be completed by the end of June 2011





**Austrian Plants
first results**

Monitoring data from the 1st Austrian plant are available since October 2008. These results have been processed and compared with the simulation results in order to validate the operation and the accuracy of the simulation tool. The performance of the system proved to be very close to the expected simulated performance.

1st Austrian Plant – Gleisdorf Town Hall





The construction of the 2nd Austrian plant at Feistritzwerke Steweag GmbH has been completed and is in operation since June 2010

2nd Austrian Plant - Feistritzwerke Steweag GmbH





Dissemination

The results of the project up to now have been presented in several conferences and magazines. A list of the most important is presented below:

- High Solar Combi-Plus Systems – A Pilot Application in a Hellenic Office Building, United Nations Environmental Programme (UNEP) and ASHRAE “Road to Climate Friendly Chillers: Moving Beyond CFCs and HCFCs”, Cairo Sep 2010
- High Solar Fraction Heating and Cooling Plant in Athens, Institute of Energy for South East Europe, Athens, Oct 2010
- From Design and Simulations to Case Study of a High Solar Combi-Plus System, ASHRAE 2011 Winter Conference “Zero Energy Design”, ASHRAE Seminar Going Lower with Solar, Las Vegas, Jan 2011
- High Combi – Pilot Projects of High Performance Solar Heating and Cooling Systems in European Buildings, 3rd Int. Conference on Renewable Energy Sources & Energy Efficiency, Nicosia, May 2011.