



Video 1 documentation

Summary of technology

Solar Thermal Collecting System with Changing Images Generation

ALCREA SOLAR Project

c/ Mercurio 15.

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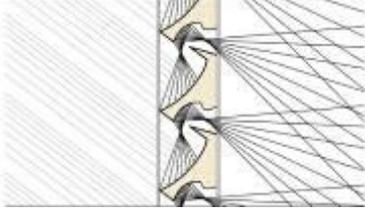
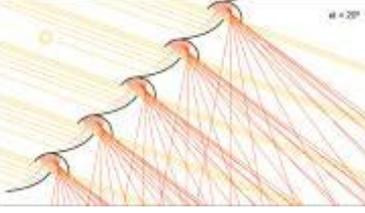
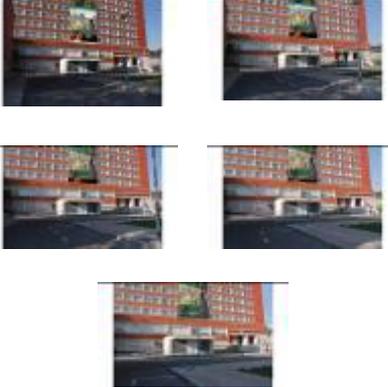
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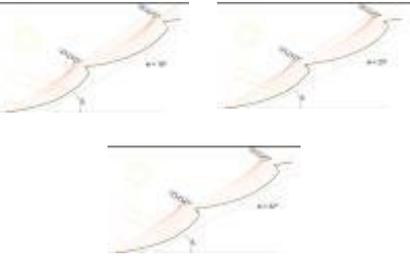
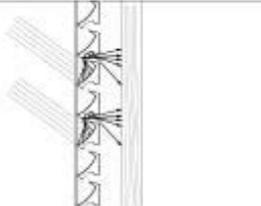
alcreasolar@alcreasolar.com

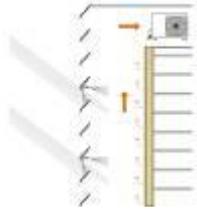
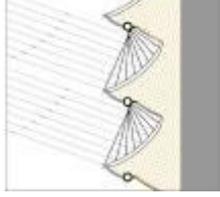
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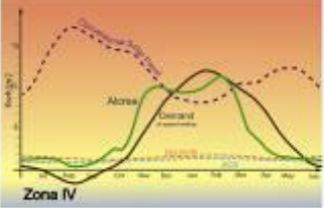
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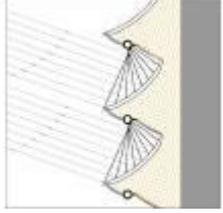
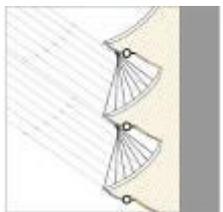
Summary of technology

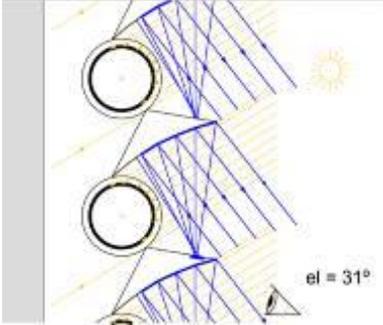
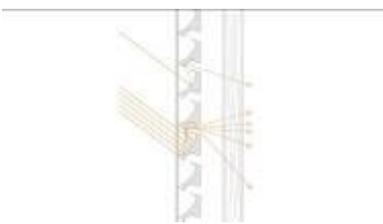
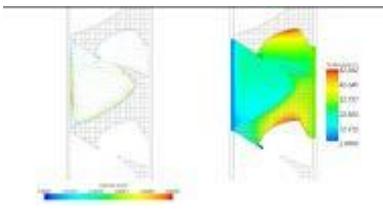
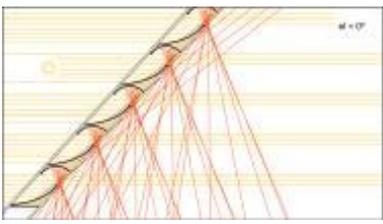
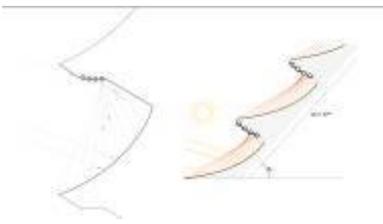
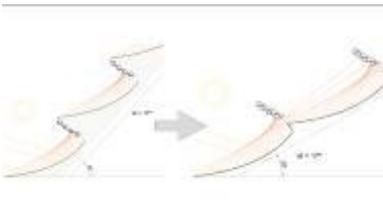
	<p>With a unique technology is simultaneously solved the three problems or any combination of them, resulting in a very wide range of products, covering areas such as</p>
	<p>i Solar thermal Collection.</p>
	<p>ii Solar illumination and high thermal insulation walls transmitting light.</p>
	<p>iii Sunscreen.</p>
	
	<p>iv Solar collecting with changing aesthetic facade.</p>

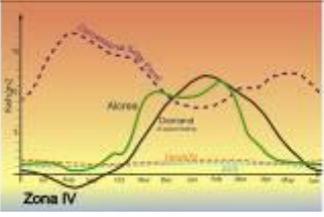
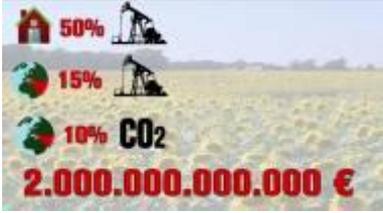
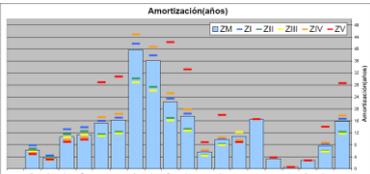
	<p>v Also applicable to refurbishments or new buildings with enclosures with collecting systems for facades and roofs.</p>
	
	
	<p>vi Changing aesthetics indoors.</p>
	<p>vii Radiant walls.</p>
	<p>viii Improved Trombe walls.</p>

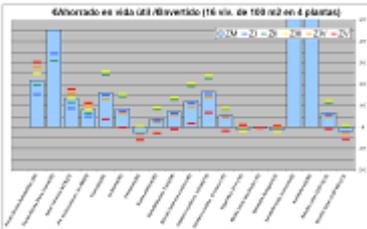
	<p>ix Heat pump support and other uses.</p>
	<p>All the technology is based on a basic, element called CAA, formed by a small reflective concentrator, with its absorbing area or zone, and the adjacent areas to this absorbing zone. They all are fixed.</p>
	
	
	
	
	<p>The system consists of arrays of these extrude elements; it means adjacent rows of linear concentrators and these elements, which may occupy an entire wall.</p>

	
	<p>Optimized geometry, the arrangement of elements and participants parameters to collect according to the demand curve, the geometric place of the points with high concentrations is determined and the procedure to create the changing images is detailed.</p>
	
	<p>Returning to the graph, the consumption of domestic hot water , which is the DHW curve, is relatively constant throughout the year and a limited number of conventional panels can cover (with certain surplus in summer and in winter otherwise)</p> <p>However heating consumption is two to three times greater than DHW and is very seasonal</p> <p>In fact, as has been said, in winter time it can take up to 8 times more energy for heating than for DHW, which will be 8 times more panels. While in summer time can be a big problem the fact that systems are catching, because the energy required is up to 20 times smaller.</p> <p>Hence the solar heating is an untapped resource, because of the problems of conventional systems to meet the requirement of strong seasonality.</p>
	<p>And this has been the goal achieved by this technology, the result of a 3 years project and over 10,000 hours of engineers and architects.</p>

	<p>The fundamentals of the technology explained in video 4 , but basically , the system is designed to perform solar gain without moving parts , when the sun's elevation is within the appropriate range to meet the needs of each season</p>
	<p>When the sun comes out of this range, the light is reflected scattered into the sky and/or used to generate the changing images, providing a nonexistent aesthetic possibilities in architectural design nowadays.</p>
	
	<p>Changing images generation is detailed in video 5 and a passerby can see different images on the facade, depending on his position or the sun's position.</p>
	
	
	

	<p>Simultaneously, the system will be collecting the sun's energy according to demand curve. This is shown in more detail in video 6 of triangle blades and the video of the first prototype of this system, video 12.</p>
	<p>This synergy between collecting and advertising can make a building rent their publicity spaces, having incomes in addition to energy savings and amortize the system in the very beginning.</p>
	<p>The same happens to a home owner who has a shop just below him, he can rent or lease this advertising space with changing images generation.</p>
	<p>Instead of harvesting the radiation from the sun in a absorbing area, as has been described, it can be redirected towards the interior side of the panel, giving multiple products related with natural lighting and high insulation glazing, and allowing the pass of light and radiation in winter time and just a little in summer time.</p>
	<p>The procedure is to reflect the rays from the concentrator in a reflective envelope which redirects them to the interior. The derivated products and the calculation of the envelope are described in video 4 about blades, sunscreen, glazing and heat pumps support.</p>
	<p>We can see how blades solutions and vertical glazing can be generalized to sloping glazing. The common factor of all is that sunlight illuminates the interior of a home or building, according with the curve of the seasonal heat demand.</p>
	<p>Similarly, the solutions for collecting in vertical surfaces can be generalized to sloped roofs. Even for very low sloping roofs, in whose case, the solutions we call with detached absorbing area, are more appropriate.</p>
	

	<p>These systems can cover up to 70 or 80 % of the heating needs, depending on the climate zone. Is the common area between the green and black curve.</p>
	<p>It should be noted that the heating can represent more than 50% of energy consumption of a home, and also a high percentage of other types of buildings.</p> <p>Globally these amounts are more than 2 trillion per year and over 15 % of global energy consumption and 10% of total greenhouse emissions.</p>
	<p>This new solar collecting technology can be used in new buildings or refurbishment, is applicable in roofs and facades, replacing even elements of them.</p>
	<p>This use of the building envelope provides the necessary surface to cover these heating percentages, and also it is done next to the place of use, reducing costs and distribution facilities.</p>
	<p>Moreover, in video 8 complementary patent will be shown, which particularizes this technology using vacuum tubes and which also claims enclosures based on them, This enclosures allow the pass of light and has a thermal conductivity around $0.5 \text{ W/m}^2/\text{°K}$. Nearly 10 times better than conventional glazing and better than a normal wall.</p>
	<p>The applicability to particular cases of this technology and profitability for the user is discussed in video 9 and others. These systems provide autonomy and independence of distribution networks, and a real chance to influence those numbers that represents the global heating and the 20-20-20 targets of the European Union.</p>
	<p>Other videos are related to economics and profitability, comparative studies with other traditional and renewable energy Systems, comparative with rehabilitation and improvement of energy efficiency Systems. Proposals for the operation and licensing for both individuals and</p>

	<p>businesses.</p>
	<p>Depending on the product and the producer, the costs can be below 70 €/m² and lower than 2 €/m² plus royalties, and furthermore the user saves the cost of the building element replaced, since in many cases these panels can replace walls and roofs, and generate advertising revenue.</p>
	<p>The investment for the average home can be less than 2000 € and amortization can be lower than 4 years.</p>
	<p>The cost of the energy produced would be around 0.03 to 0.05 €/kWh, with annual sales that may exceed 47 M€/year from the third or fourth year (considering only the Spanish market)</p>
	<p>In February 2014, there are no products on the market, only the ability to do small runs for the local market but if you are interested in the products let us know and we will give you preference and the closest producer.</p>