Team: SunCatch

Project: SunStainable System

TECHNICAL ASSISTANCE REQUEST

For optimal product effectivity and efficiency, a series of experiments should be conducted that can best be done at NREL or similar testing & validating facilities.

1. Analysis of the processes of the crystallization of sodium chloride and its analogs and their endothermic qualities in order to create the most efficient heat collector. Simultaneously studying the processes of storage and disposal and/or recycling of the salt heat-transfer agent. According to our preliminary calculations, we can increase the efficiency of heat accumulation in the collector up to 8 times.

2. Researching thermal expansion of an acrylic mirror in combination with two-component foams. The use of such a combination of materials for the reflectors can significantly reduce the cost of manufacturing and optimize the mass production process. Our task is to select adhesive components in such a manner so that after hardening the stress of thermal expansion on the acrylic mirrors will be minimal.

3. Investigating various mechanisms and electricity generating devices to determine the most efficient way to generate electricity in different conditions and environment and depending on consumers demand.

For instance:

3.1 On small and mobile CSP systems, “the Thompson effect” might be implemented in its many versions, for example, “the Peltier effect”. Taking those conclusions into consideration the permissible range of operating temperatures will become clear along with the ideal degree of operating temperature. The results of this study would assist in determining placement of the electrical generating device at its most efficient location in the system and will give an understanding of its maximum potential in relation to the area of the mirrors. Here we may need infrared sensors and some power tools. In this configuration, systems could be used for remote areas and short-term purposes like the army, camping and remote construction sites, etc.

3.2 For systems with areas significantly exceeding those of mobile systems, the Stirling engine could be adopted, which has proven itself in low-temperature (under boiling temperatures) heat-transfers. We are convinced that these inexpensive and durable engines, driven by a slight fluctuation of temperature could excel in generating electricity. As an example, such systems could be used to supply energy to the private sector, remote farming enterprises, in the army, for warming icy sections of roadways (bridges, slopes) in winter, providing energy and hot water to small workshops, garages, hotels etc.

3.3 To provide energy to commercial and large enterprises, a system based on a screw turbine might be more effective. Currently, the market offers systems with high-pressure steam turbines, but their main disadvantage is the high cost, which makes them inaccessible to most consumers. Utilizing the screw turbine, we could lower the cost of production, operating, and ownership. To conduct such studies certain conditions are required and so measuring instruments, such as steam flow meters, temperature sensors, electrical meters, pipelines for connecting a turbine, and possibly some other supplies would be needed.

4. In order to find the most efficient and durable pipelines, we need to conduct research with various types of hoses that we could be used in our systems, depending on the type of system and specific operating conditions. For these studies, we need a hydraulic pump to create pressure in hoses and the possibility of exposing the hoses to critical temperatures. This study is especially necessary for systems using a turbine.

5. There are a number of other issues regarding the selection of control and remote-control systems, as well as the selection of microprocessors and weather monitoring and geo-location systems. At the moment, we can only theorize about how it should all look and work.

American-Made Network has an invaluable resource of Connectors we hope to access.