

Goal of the project: The main objective of the project is designing, testing and making a prototype of a micro solar plant to produce electricity and heat using Fresnel lenses and Stirling engine at the price of 1 Euro / W. The specific cost of electricity produced by PV panels is 3Euro/W. Comparing the prices; the product will be competitive on internal and external markets.

Short description of the project: Making the installation is based on the utility model certificate no.RO 2010 U 00057/29.07.2011 issued by OSIM. The model suggests as a technological innovation the use of Fresnel lenses and Stirling engine. Energy chain links will produce at the same time mechanical energy, thermal energy and electric power. The plant will use Fresnel lenses for the concentration of the radiation and Stirling engine to convert solar energy into mechanical energy. Mechanical energy is converted into electricity by an alternator. Thermal solar conversion will provide thermal energy for the hot source of the Stirling engine.

Project implemented by: This project is implemented by the Department "Physical Fundamentals of Engineering" in collaboration with SC ENERGOSOPHIA Ltd as contractor/customer.

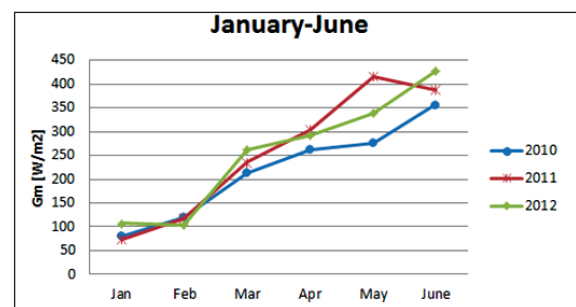
Implementation period:
29.06.2012 – 05.12.2012

Main activities: Studies for this project started by reinterpreting the obtained results from previous measurements on heliothermal potential in the western part of Romania. All necessary equipment's and parts were purchased for making this installation. On 16 Nov at BFI headquarters an important meeting took place.

The analyzed themes were: insolation and weather factors in the western part of Romania, using Fresnel lenses for concentrating solar radiation, using Stirling engine in solar applications, using an alternator and inverter, project management. A proposal of an invention was submitted for OSIM by Energosophia.

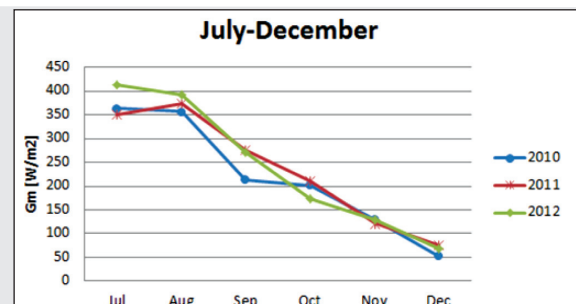
Results:

a) Measurement results indicate that local solar potential is comparable to that of other EU countries that are successfully implementing innovative solar installations.



b) At „Installations for Constructions and Ambient Comfort” Conference from 11-12 April 2013, 4 scientific papers were proposed for communication and publication.

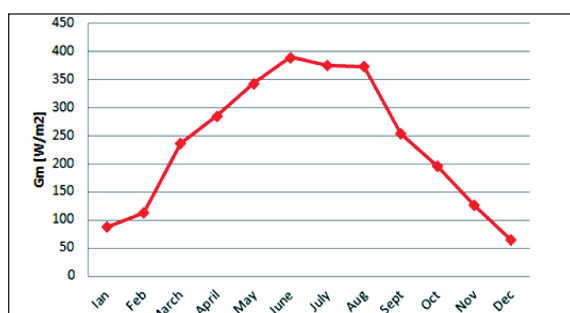
c) The invention “Solar Thermo Electrical Plant with Fresnel Lenses” was accepted for patent litigation. This invention is intellectual property of an author from Energosophia and it will be protected.



“If you want to find the secrets of the universe, think in terms of energy, frequency and vibration.”

Nikola Tesla

d) Measurements planned for the period with insolation in 2013 will lead to some papers concerning solar energy which will be presented at national and international conferences. These papers are designed to disseminate the results, and also the educational and public interest concerning renewable energy, namely solar energy.



e) The installation is part of the program called Directive 2006/32/CE and part of the new energy politics of EU from 2007, called "20-20-20" which suggests the apparition in the market of new innovative products. Comparative studies will be developed concerning energy efficiency, feasibility of heat pipe tubes, PV panels and Fresnel lens installation and also Stirling engine.



f) Partnership development between BFI and Energosophia

Fields of interest:

- Areas of interest concerning this product consist of the industrial energy consumers, public and private for electricity, thermal energy and mechanical energy and also the energy supply sector.
- It is expected that electricity prices will drop from 3euro/W at 1 euro/W; installation

possibilities generated will be attractive in the medium and long term.

c) Commercial attractiveness of the product will create for Energosophia Company the possibility of developing by increasing the turnover and the number of employees.

d) Developing the theoretical basis of the functionality of the plant will stimulate paper development to be proposed in journals.

e) Didactical processing of functionality mechanisms will be interesting for students and masters students of engineering faculties.

f) At the same time the installation will be useful for PhD students in development of solar energy conversion topics and in other forms of energy.

Research Centre: Research centre for advanced study methods for physics phenomena.

Financed through/by: Ministry of Education, Research, Youth and Sports through the Program Innovation from PN II, subprogram Services for Innovation - Innovation checks.

Research team: From BFI: 1. Assist. Prof. Dr. Ioan Luminosu - Director; 2. Prof. Dr. Eng. Dumitru Toader; 3. Prof. Dr. Eng. Aldo De Sabata; 4. Assist. Prof. Dr. Ciprian Sorandaru; 5 Assist. Prof. Dr. Virgil Stoica; 6. Msc student Mirela Enache. From Energosophia: 1. Assist. Prof. Dr. Traian Zamfir; 2. Eng. Felix Zamfir; 3. Eng. I. Dinculescu.

Applicability and transferability of the results:

The results are applicable and transferable to: a) public administration, b) public and private energy consumers, c) for energy suppliers, d) industry.

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"Our energy is an expression of cosmic energy"

Deepak Chopra