

Solar Energy for Varna

Yordanka Eneva, instructor of the project

Gratsiela Dimitrova, Svetlana Dimova and Dimitar Enev, participants of the project
Vocational Secondary School of Economics "Dr. Ivan Bogorov" – Varna

Abstract

"Solar Energy for Varna" is a project that acquaints students with the problem of energy crisis and global warming. There is a team of teachers and students who work in this project and whose aim is to achieve a set of activities in order to solve the problem by using mainly solar energy for production of hot water and electricity.

The project is funded by Varna's municipality. 75 students from ten different schools participated in its realization.

Key words: energy crisis, global warming, solar energy, solar efficiency, financial refund, interactive teaching methods, laboratory

1. Introduction

The aim of the project "Solar energy Varna" was to put the problem of global warming, and the local community to pay attention to it. A series of activities were held in makeshift laboratories enabled the local youth to learn about processes and phenomena associated with the use of the sun for the production of electricity, hot water, solar cooling. The activities were realized during the summer months of 2007.

2. Entity

2.1 Objective

- Getting information about the Sun, solar-terrestrial relations and benefit for the people as a source of energy by generating hot water, heating, cooling and electricity production;
- Gaining experience by defining and calculating the economic benefits by using solar energy
- Understanding the characteristics of solar collectors, their effectiveness and financial return on investment
- Acquisition of skills for learning, thinking and use of theoretical knowledge in solving economic and domestic issues, teamwork, responsibility towards other members of the team, and how to spend spare time.
- Taking part in solving global society and humanity problems

2.2 Methods

- Interactive teaching methods include: seminars and discussion under the topic "The sun as a star and energy source "
Attractive telescopic observations
- Entertaining experiments demonstrating the possibilities of solar energy [1]
- Perform installation and service of solar collector "WOLF"
- Scientific research - research that observes the performance and effectiveness of collectors for heating water under different weather conditions and capabilities of the PV converter
- Communication
- Publicity and visibility

2.3 Activities under the project

The project includes appropriate selection of activities that trigger the thinking of young people to form skills, to measure the capacity of water, pressure, temperature, tension, size of electric current and others. Students gained knowledge of installation and use of solar panels and opportunities for the use of photovoltaic voltage converters. Thus, they spent their free time and gained knowledge and skills that are useful for their lives.

The activities were carried out in several modules:

1. **Interactive seminar and discussion** on the title “*The Sun as a star and energy source*” and attractive telescopic observations in National Astronomical Observatoria and Planetarium "Nicolaus Copernicus" under the guidance of skilled astronomer Veselka Radeva. Students were acquainted with the generation, transmission and transfer of energy from our star.
2. **Solar technical laboratory**: youths carried out installation and service of solar collector "WOLF" under the direction of engineer Vasco Enev - specialist in heat and mass exchange equipment.
3. **Solar Research Laboratory**: After the installation of the collector, young people have studied the characteristics and effectiveness of collectors for heating water in different weather conditions under the leadership of professor Atanas Mirchev - professor at the Technical University of Varna and teachers of physics.
4. **Group of diagnostic efficiency of solar collectors**: This group analyze and compare the results obtained from solar research laboratory operating with real solar system in a house installed with solar collectors.
5. **Solar Research Laboratory**: Young people explored the possibilities of photovoltaic power converter / solar battery /, elaborated models of vehicles powered by solar panels under the leadership of assistant Venelin Pavlov - a lecturer at the Technical University of Varna and teachers of physics.

Project participants were students from several schools in Varna – Vocational Secondary School of Economics “Dr. Ivan Bogorov”, Secondary School “Peyo K. Yavorov”, National Secondary School of Humanities and Arts “Konstantin Preslav”, Secondary School “Ljuben Karavelov”, Primary School “Anton Strashimirov”, Primary School “P. R. Slaveikov”. Students from these schools made demonstration experiments to citizens and visitors on the festival day of the city of Varna. Demonstrations were filmed and broadcasted on local television MSAT.

2.4 Innovation and scientific / technical quality of the results

The project gives the chance to

- Introducing information to the students about renewable energy resources in their leisure time
- Getting a talk with students by discussing the current developments in solar technology - solar heating, cooling and liaison, and open problems of contemporary society
- Obtaining feedback from adolescents about their level of technical, diagnostic, research knowledge

2.5 Originality

- For the first time attractive events were held in the city of Varna, sponsors' aim was to demonstrate the capabilities of the Sun to the citizens and guests of Varna.
- Developing skills for measuring the capacity of water, pressure, temperature, tension, size of electric current.

- Providing an opportunity for obtaining knowledge in the field of installation and use of solar and photovoltaic converters of voltage.

2.6 Interest of Eurosun – Audience

- Interactive methods by engaging youth in their free time
- Introduction to citizens with the capabilities of the Sun
- Finding sponsors for the needs of education.

3. Conclusion

The project gives the chance to be used interactive methods that have to engage young people leisure time in this way they can learn more how to use the sun. Demonstrations attracted the attention of citizens and attracted their thinking to the use of solar technology for generating electricity from the sun and use of solar technologies for heating and cooling.

References:

- [1] Environmental Association “Earth” - "Solar installations on the principle: you will do it by yourself"