

SOLAR ENERGY EDUCATION ACTIVITIES DEVELOPED BY THE ROMANIAN ISES SECTION

Laurentiu Fara, Maria Popa and Silvian Fara
Romanian ISES Section
c/o Physics Dept., Bucharest Polytechnic University
313, Splaiul Independentei, Bucharest, 77206, ROMANIA
Tel.: +40-1-411 9603; Fax: +40-1-411 9962
E-mail: sres@nare.renerg.pub.ro; sfara@automation.ipa.ro

ABSTRACT

The Romanian ISES Section has developed since its establishment in 1991 specific education activities in the area of solar energy, both within the framework of international co-operation actions and within local initiatives. The main points to be considered are: organisation of conferences and workshops with international participation, specific publications, yearly celebration of SunDay events in Romania (1994 – 1999), Internet activities including Web pages, demonstration projects. All these activities allow the dissemination of renewable energy promotion in Romania, with a favourable environmental and social impact in the region.

Keywords: Romanian ISES Section; SunDay events; Web pages; Renewable Energy Technologies (RET); Demonstration Projects.

INTRODUCTION

The Romanian Solar Energy Society - Romanian Section of ISES has been involved, since its establishment in 1991 till the present day, in the development of specific measures for the promotion of renewable energy training and education activities. The political and economic changes currently taking place in Romania and in other Central and Eastern European countries present a unique opportunity to re-orient the policies in this region towards sustainable energy development. There are three main ways, in our viewpoint, to promote renewable energy technologies in our region: international coordination of research effects, private initiative, and external funding assistance.

The renewable energy is the key of sustainable development. That is why a renewable energy strategy should include several objectives (environmental, social and fiscal). For the success of this strategy, several channels could be established with: central and local authorities; public sector; private sector; environmental NGOs; research and design institutes; banks; environmental local agencies. Taking into account these ideas, the Romanian ISES Section through its members developed the following main activities for training and education in the solar energy area:

- Organisation of local conferences and workshops.
- Publication of a Newsletter in Romania dedicated to public information.
- Publication of an international journal in English.
- Yearly organisation of specific SunDay events in June, since 1994 till the present time (1999).
- Development of international activities (Web pages).
- Dissemination of renewable energy technologies by means of demonstration projects.

THE ROMANIAN ISES NEWSLETTER

Based on the general objectives and policies of the International Solar Energy Society (ISES), the Romanian ISES Newsletter [1] was elaborated in Romania, and for the Romanian people. The main points covered by this publication were:

- Social-political and economic involvement of renewable energy utilisation on a large scale;
- Information concerning the elaboration of specialised databases on RES;
- Development of international co-operation programmes in the areas of energy and environment;
- Aspects of environmental legislation; results obtained within international roundtables and workshops (seminars) where R&D issues as well as solar marketing issues were considered.

Educational actions were carried out at local level by: communication between experts and users; involvement of students and young experts; formation and development of a specialised market; development of a civil environmental society; enforcement of specific legislation for RES promotions; correlation of national plans and environmental programmes including renewable energy aspects and trends with the energy policies of the European Union and of the United Nations.

INTERNATIONAL JOURNAL OF ROMANIA ISES

Two versions were published (English and Romanian) of the scientific journal of Romania ISES Section entitled: "SOLAR ENERGY IN ROMANIA" in 1992 and 1993, [2]. Since 1994, an international journal entitled: "SOLAR ENERGY FOR SUSTAINABLE DEVELOPMENT" was published [3] and the following items were considered:

- Social, economic and political aspects of renewable energy;
- Fundamental studies in renewable energy field;
- Renewable energy potential assessment;
- Ecological applications.

The articles published in the journal were papers presented at various International Conferences and Workshops organised in Romania, or articles signed by reputed international experts in the solar energy field.

The issues published emphasized the human resources existing in Romania, noting the existence in the country of a good human potential who could develop R&D activities related to renewable energy technologies. They also highlighted the great interest for such an international journal in Central and Eastern Europe, both due to local experts and especially to international experts. At the same time, various aspects of renewable energy policies were published. These papers stimulated the interest of central and local authorities, as well as of the market actors, [4], [5].

ORGANISATION OF CONFERENCES AND WORKSHOPS

In November 1992, the Romanian Solar Energy Society - Romania ISES Section organised an international conference on solar energy R&D trends in Romania. The Academy of Romania together with the European Commission (DGXII and DGXVII) supported this event both through a high level participation and through remarkable contributions. At the same time, the interest of Romanian experts was very special.

At the end of August 1993 and in mid September 1994, two international workshops were organised by Romanian Solar Energy Society; the events were held at Eforie (on the Black Sea Coast) and Tulcea (in the Danube Delta), and they had an important environmental and educational impact at local level (especially in the Danube Delta area).

ROMANIAN SUNDAY EVENTS

European SunDay events were initiated by ISES Europe. Starting with 1994, the Romanian ISES Section organised several Sunday events in Romania. For example, the following events were organised in June 1997 in Romania: "Bioclimatic Design in Romania" Symposium; "Sunday in Galati" Exhibition; "ICEMENERG PV Pilot Plant - Open Doors Day", etc. More details regarding these events could be found in a special brochure entitled "Sunday '97 Events Report" published by ISES-Europe in cooperation with the Franklin Company (UK).

These three events were also presented in two versions in the web site of NARE (National Agency for Renewable Energy): http://www.renery.pub.ro/SunDay_97.html.



Fig.1 SunDay'98 – Children's Exhibition of Paintings

In June 1998, seven SunDay events were organised in Romania:

- SO CER (Romanian Energy Efficiency Association in Craiova) held a symposium on renewable energy at their headquarters in Craiova.
- "Prietenii Pamantului", a Romanian environmental organisation, organised a conference and exhibition with the attendance of regional governmental representatives (local authorities).
- SRES (Romanian Solar Energy Society) organised an exhibition of children's paintings in Bucharest (see Fig. 1). The young artists ranged from seven to fourteen years of age, and prizes and certificates were given for all the exhibited works of arts.
- ICEMENERG (Energy Research Institute) put into operation a rural 3.4 kW PV/wind hybrid system on a farm in Bihor County. The project was co-funded through INCO-COPERNICUS.

- In association with the Airclub G.Banciulescu, SRES arranged an air show. There were some acrobatic displays, a parachute display and finally the city of Ploiesti was "bombed" with leaflets informing about SunDay.
- A Round-Table workshop was organised by IPA SA (Research and Design Institute for Automation) and SRES, called "PV Energy Projects Developed in Romania".
- A seminar entitled "Renewable Energy" was held by Timisoara Technical University, focused on environmental issues and actual project reports. Local environment officials and Chamber of Commerce representatives attended the event.

All these SunDay events were coordinated by Prof. Laurentiu Fara, President of the Romanian ISES Section, and were presented in the journal Sun At Work in Europe (SAWIE) published by Franklin Company (UK). At the same time, the events illustrated by photos were presented in two versions (English and Romanian) on the NARE web pages (<http://www.renery.pub.ro/Sunday98.html>).

In 1999, the Romanian Solar Energy Society – Romanian ISES Section in collaboration with the Institute of Research and Design for Automation (IPA SA) initiated the organisation, on June 19th, of a Symposium on “Solar Symbols in Everyday Life”. This action had a deep-going cultural and interdisciplinary character. Various personalities from the cultural and scientific area participated in the Symposium, as well as notable institutions from our country, namely: Institute for Ethnography and Folklore “C. Brăiloiu” of the Romanian Academy, Museum of the Romanian Peasant, Astronomy Institute of the Romanian Academy, National Institute for Meteorology and Hydrology (INMH), Institute of Research and Design for Automation (IPA SA), History Museum of Bucharest City, Faculty of Geology and Geophysics, Bucharest University. The Symposium included three sections, namely:

- Session I - Solar Symbols in Ethnology (e.g. Light Symbol in Romanian Folk Tradition; Holidays of the Summer Solstice; Mythologies of Black Sun);
- Session II - Solar Symbols in Astronomy, Meteorology and Energy Conversion (e.g. 11 August 1999, a New SunDay for Romania (see Fig. 2); Global UV Solar Radiation; Stand-Alone Photovoltaic Systems for Mountain Areas);
- Session III - Solar Symbols in Prehistory (e.g. Solar Elements in Art and Building Tradition from Romania’s Prehistory; Staffs, Wheels, Sun Duals in Prehistory and Ethnos; Ceahlău Mountain Holiday, a Far-off Echo of Solar Rites”).



Fig. 2 “Solar Symbols in Everyday Life” Symposium –
“11 August 1999, a New SunDay for Romania”

SOLAR ENERGY ACTIVITIES BY INTERNET

Specific web pages were developed based on the support of a German Foundation. Also, other web pages on non-polluting energy technologies were developed, namely:

- examples of stand-alone photovoltaic systems which are in operation in Europe as well as all over the world; the examples are accompanied by beautiful photos.
- hydrogen projects and fuel cell systems; the most significant international projects on this subject are presented, as well as other web links, addresses, remarkable events.

A server was installed at SRES Headquarters, which is in operation since March 1997. A dedicated operation system - LINUX - was installed, which allows access to specific services, namely: e-mail, ftp, telnet and www. The server is provided with a special modem which allows data transmission by Internet using an international direct phone line.

DISSEMINATION OF RENEWABLE ENERGY TECHNOLOGIES (RET) THROUGH DEMONSTRATION PROJECTS

A good example of a successful demonstration project accomplished in Romania within an international co-operation action co-financed by the European Commission was the INCO-COPERNICUS Project “Stand-Alone PV Systems for Emergency Signal Transmission and Environmental Control in Isolated Mountain Areas”, [6]. The project partners were WIP-München (co-ordinator), CRES-Greece, IPA SA-Bucharest and IAP-Republic of Moldova.

Within the framework of this project, two main independent PV powered systems were built in Romania: an emergency signal repeater station (Fig. 3a) and a pollution control unit combined with a sub-system for meteorological data monitoring (Fig. 3b). The stand-alone systems are located in isolated mountain areas which are frequented by alpine tourists.

The PV systems installed demonstrate the capacity of the Romanian PV industry to design and install reliable stand-alone PV systems and their ability to implement smart control technologies to reduce the electricity demand of key components.

One must keep in mind that, while Western European countries have long been aware of the dangers of pollution and have taken many steps aimed to reduce it, the situation is completely different in many of the Central European countries. With the breakdown of communism, the economic situation deteriorated. The entire infrastructure has to be modernised, hardly any ambient air pollution control system is of the automatic type and continuous measurements are impossible. Besides, many remote locations lack a reliable power supply and, obviously, a diesel generator as power supply would require a significant operation and maintenance effort and its exhaust fumes would falsify the measurement values.



Fig. 3a PV-Powered Pollution Control Unit



Fig. 3b PV-Powered Emergency Signal Repeater Station

The environmental control system (Fig. 4a) installed in this project shows that a stand-alone pollution control unit can be reliably powered by PV energy at reasonable costs, provided all options to reduce the energy demand are exploited. The second unit installed within the project was an emergency signal transmission system to be used by the non-profit mountain rescue organisation Salvamont (Fig. 4b). Emergency calls in alpine tourist resorts of Romania can be transmitted via portable transmitters but the range is dictated by the geographical conditions, which considerably limits the radius of action. Therefore, it was decided to install a PV-powered autonomous signal repeater station on a remote peak in the Carpathian Mountains. The demonstration system was designed to create a demand for PV powered emergency signal repeater stations in Romania.

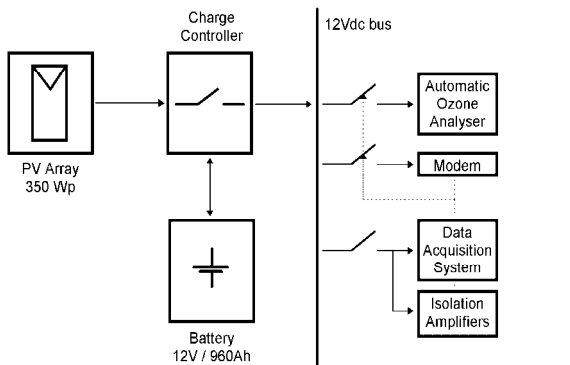


Fig. 4a Pollution Control Unit-PV System Block Diagram

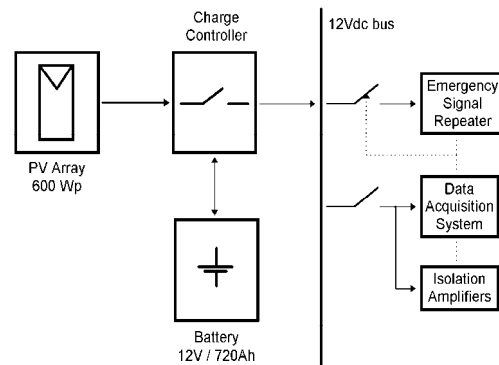


Fig. 4b Repeater Station-PV System Block Diagram

The accomplishment of these demonstration projects proves the viability of these PV applications in Romania and the possibility to disseminate them through specific actions by the Romanian ISES Section, i.e. roundtables or seminars organised for certain target user groups. Such an action was the roundtable organised on the occasion of SunDay '98.

CONCLUSIONS

The past and future activities of the experts from the Romanian ISES Section in the area of renewable energy technologies take into account the environment impact, social aspects, as well as the development of an efficient local industry in RET. The training activities for population and young people could be a priority, both of the National Agency for Renewable Energy (NARE) and of Research and Design Institute for Automation (IPA).

REFERENCES

1. Solar Energy in Romania, Scientific and Technical Journal published by the Romanian ISES Section (1992-1993)
2. Solar Energy for Sustainable Development, International Journal published by Romanian ISES Section (1994-1997)
3. Romanian ISES Section Newsletter (in Romania), 1992-1997
4. PHARE and TERES II Reports of NARE (1995-1996)
5. Leonardo da Vinci Project Proposal, March 1999
6. INCO-COPERNICUS Reports of IPA (1997-1998)