

## ***Solar collectors in Nesluša***

### ***Energy savings and the use of RES***

***- a way towards sustainable development of towns and communities***

## ***Energy Centre Bratislava, Slovakia***

### **Summary**

Implementation of one demonstrative project in a Slovak community was part of the project “Energy savings and the use of RES - a way towards sustainable development of towns and communities” carried out by Energy Centre Bratislava (ECB). The building of the Institution of social care for the old in Nesluša community has been chosen for the utilisation of solar energy for preparation of domestic hot water (DHW). Three solar collectors were set up on the south wall with the angle of 45° between the wall and a collector. The boiler with a possibility of electric regulation was installed indoors. Installed solar collectors may cover 75% of hot water needs in summer time (May-September). The project enabled the facility to reduce energy costs and use saved money level of nursing and living standards of inhabitants. Besides, the project increased public awareness and access to information on the use of RES and energy savings.

<b>End-user area</b>	<b>Target Audience</b>	<b>Technical</b>
<input type="checkbox"/> New buildings	<input checked="" type="checkbox"/> Citizens	<input type="checkbox"/> Energy efficiency
<input checked="" type="checkbox"/> Refurbishment of buildings	<input type="checkbox"/> Households	<input checked="" type="checkbox"/> Heating
<input type="checkbox"/> Transport and mobility	<input type="checkbox"/> Property owners	<input type="checkbox"/> Cooling
<input type="checkbox"/> Financial instruments	<input type="checkbox"/> Schools and universities	<input type="checkbox"/> Appliances
<input type="checkbox"/> Industry	<input type="checkbox"/> Decision makers	<input type="checkbox"/> Lighting
<input type="checkbox"/> Legal initiatives (municipal regulations, directives, etc)	<input checked="" type="checkbox"/> Local and regional authorities	<input type="checkbox"/> CHP
<input type="checkbox"/> Planning issues	<input type="checkbox"/> Transport companies	<input type="checkbox"/> District Heating
<input type="checkbox"/> Sustainable communities	<input type="checkbox"/> Utilities	<input checked="" type="checkbox"/> Solar energy
<input checked="" type="checkbox"/> User behaviour	<input type="checkbox"/> ESCOs	<input type="checkbox"/> Biomass
<input type="checkbox"/> Education	<input type="checkbox"/> Architects and engineers	<input type="checkbox"/> Wind
<input type="checkbox"/> Other	<input type="checkbox"/> Financial institutions	<input type="checkbox"/> Geothermal
	<input type="checkbox"/> Other	<input type="checkbox"/> Hydro power
		<input type="checkbox"/> Other

### **Context**

Conversion of solar energy received by the earth’s surface in the form of electromagnetic waves into heat performs in a solar collector on the basis of absorption principle. Absorbed heat energy is transferred by a medium (water and glycol) that goes through an absorber directly or through a heat exchanger to a consumer.

One of the most common ways of using solar energy is for preparation of domestic hot water, DHW. Solar collectors can play an important role in meeting hot water needs of the public sector. Buildings such as schools, health clinics or pensioner houses, as in our case, often have a constant

need for hot water supply all year round, which means that the solar collectors work with maximum efficiency throughout the entire year.

### **Objectives**

The direct objective of the project is an installation of solar collectors on the building of the Institute of social in order to reduce energy bills and to use saved money on improvement of livings standards. Short term objective of the project “Energy savings and the use of RES - a way to sustainable development of towns and communities” is to inform the representatives of communities, mayors and local NGOs about the possibilities of using RES and related environmental and economic gains of towns and communities in Slovakia.

Long-term objective of the project is to stimulate preparation and implementation of energy savings programs, using of RES in communities by providing information and follow-up consultations with specialists or other interested persons.

### **Process**

The start date of the project was June 2001 and the duration 6 months.



The building chosen was a two-storied building with 6 rooms for 10 people. The total demand of domestic hot water (DHW) 300 l/day. The building faces west-east side and in terms of spatial disposition the south side is the best place for setting up solar collectors with the angel of 45° between the wall and a collector. The heating during heating season (October - April) is secured by the boiler working on coke, in summer time DHW is secured by electrical energy.

Three solar collectors (Type Heliostar 202 N2P) with the whole area 6m<sup>2</sup> were set up on the south wall with the angle of 45° between the wall and a collector. 300 liters boiler with a possibility of electric regulation was installed indoors. DHW can be supplied by solar collectors, central heating or electric energy.

As a result of preliminary negotiations ECB has gained a possibility to use Slovak broadcast to support the project. Six discussions with specialists opened floor to public discussions. Audience got involved into discussion by means of questions following the development of the dialogue between all interested sides. In this way we tried to secure direct and real problem oriented communication. All responses of citizens and local authorities will be taken into consideration and will contribute to the development of further activities in this field (further spreading of information, project implementation, counseling, etc.).

Cooperation partners assisted ECB in choosing the locality and developing the activities of the project. The company Thermosolar Ziar nad Hronom was responsible for the implementation part of the project.

### **Financial resources and partners**

Investment cost into setting up of the solar collectors was 3023,2 €. Pay back period is 15 years calculated using current prices for electric energy. Most probably prices for electric energy will be increased to the level of the prices in the EU where they are significantly higher.

Total annual electric energy demand to supply DHW is 18 958 kWh, which is €1234,47. Total annual coke demand for heating is 9,170 tonnes, which is 810,37 €, the total annual CO<sub>2</sub> emissions from combustion of coke is 28,885 t.

Type/Unit	Local production kWh/year	Cost €	Local Production Ton CO <sub>2</sub>
Electricity	18 958	1234	1,725
Coke	68 775	810	28,900
Solar collector	3 000	Invest 3023	0

In summer time DHW was supplied only by electric energy before solar collectors installation. Now solar collectors cover 75% of DHW in the period from May to September. Annual surplus of energy produced by solar collectors is 3 000 kWh/year, which saves 16% of all expenses on electric energy consumption for DHW. Annual saved cost using current prices is 0,065 €/kWh, which represents 195,34 €/year savings.

Co-operation partners:

- Energy Centre Bratislava
- Association of towns and communities of Slovakia
- Municipal news
- Slovak radio – regional broadcast
- Agency for regional development
- Citizen association of Biomas
- Association of communities Javorina
- SEA - Slovak Energy Agency
- Faculty of electrical engineering of Slovak Technical University in Bratislava

- Thermosolar Ziar nad Hronom
- Ecoenergia - saving of energy and fuels

## **Results**

Solar collectors cover 75 % cost for heat water needs in summer time (May-September), annual surplus is about 3000 kWh/year. The operating life of solar collectors is 25-30 years.

The Institution of social care for the old in Nesluša community is a facility for mental defective women. There are 10 women in the facility. The institution is financed by the Government. Installation of the solar collectors has partially reduced energy costs. Saved money from state budget can be used now for improvement of material supply of the facility, level of nursing and living standards of inhabitants of the facility

The project has increased public access to the information about all relevant aspects of energy savings and the use of RES. Series of articles in Municipal news ((in published and electronic version in Internet) and series discussions on the radio have secured information supply. In addition, the publication of summarising information brochure is a part of the project. It is being distributed by Association of towns and communities of Slovakia, local NGO's, and other co-operating organisations and Energy Centre Bratislava during various events connected to energy efficiency issues.

## **Lessons learned and repeatability**

### **Contact for more information:**

Organisation / Agency: Energy Centre Bratislava  
Main contact: Vladimír Hecl  
Address: Bajkalska 27; 821 01 Bratislava  
Tel: +421 2 582 48 472  
E-mail: [office@ecbratislava.sk](mailto:office@ecbratislava.sk)  
Web Site: [www.ecbratislava.sk](http://www.ecbratislava.sk)

Other contacts: Association of towns and communities in Slovakia  
Agency for regional development  
Slovak Energy Agency  
Thermosolar Ziar nad Hronom  
Faculty of electrical engineering of Slovak Technical  
University in Bratislava  
Ecoenergia