

**Rural Sustainable Development through Integration
of Renewable Energy Technologies in Poor
European Regions**

Specific Targeted Research Project, FP6 509204

RES INTEGRATION

WORKSHOP IN STRUMICA

**STRUMICA, REPUBLIC OF
MACEDONIA, 8 June, 2007**

PODBELASICA REGION IN REPUBLIC OF MACEDONIA



Rather poor agricultural region at the South/East part of the Republic of Macedonia, located at the slope of Belasica mountain (South border of the country with Greece) and Strumica field at the North/East (East border of the Country to Bulgaria).

VILLAGE KUKLISH IN THE REGION



Typical agricultural villages with very poor infrastructure



WORKSHOP OF PROJECT PARTICIPANTS AND LOCAL AUTHORITIES

In order to transfer the information and results of the project RES Integration to the local authorities, a Workshop has been organized on June 8, 2007 in the meeting room of the municipality of Strumica , with the presence of the Mayor of Strumica, heads of departments for economy, development and planning and other interested local authorities and project participants from three West Balkan countries (Albania, Macedonia and Serbia) and three EC Countries (Greece, Italy and Germany), Led by the project coordinator Prof.emeritus Spiros Kyritsis, from The Agricultural University of Athens (Greece).



MEETING PLACE



**Closure of the workshop has been
Performed in the hotel “Sirius” in
Strumica**



WORKSHOP AGENDA

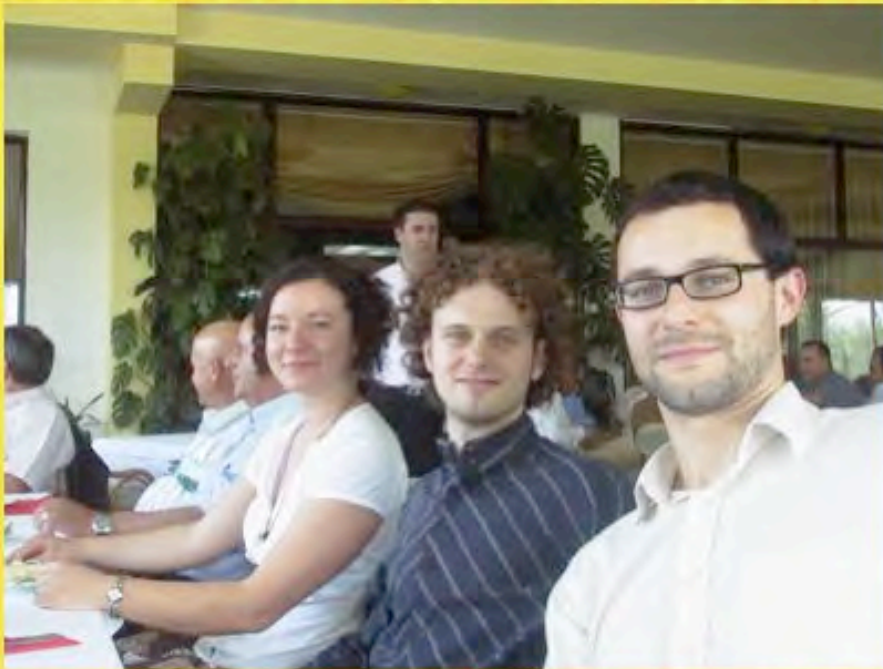
- 1. OPENING OF THE WORKSHOP (Mr. Zaev, Mayor of Strumica, Prof. Kyritsis, Project coordinator)**
- 2. PROJECT PRESENTATION (Prof. Popovski, coordinator of the Macedonian team)**
- 3. QUESTIONS AND DISCUSSION**
- 4. VISIT TO THE PROJECT SITE**
- 5. CLOSING THE MEETING (Prof. Kyritsis, Project coordinator)**



**Geothermally
Heated glassho-
se in Bansko**



PLEASANT WORKING ATMOSPHERE



Project participants from Albania, Germany and Italy



PODBELASICA REGION



Characteristic view to the Podbelasica region



PRECONDITIONS 1

- ❖ Region has wide agricultural production, offering possibilities for agricultural wastes energy use but also possibilities for organization of energy plants production for production of biofuels;
- ❖ Average economy level of the region is very low, resulting with emigration of people in foreign countries and stagnation of population;
- ❖ There is no industry in the region;
- ❖ Tourist economy is organized only in one village (spa) but it is presently in a very bad situation, i.e. stagnation and absence of any development;
- ❖ Agricultural production is disorganized and in stagnation due to the absence of organized approach to possible markets and support of the state;
- ❖ Forests exploitation has an organization frame (public utility) but with very poor performances and employment;

PRECONDITIONS 2

- ❖ Region has very poor infrastructure, i.e.:
 - a) Road connections are rather poor and weak maintained;
 - b) Electricity supply is accommodated only for small users;
 - c) Water supply is primitive, i.e. mainly from local boreholes which are not always properly completed;
 - d) There is no canalization in the villages;
 - e) There is no regularly organized collection of waste in the villages (and its treatment).
- ❖ Quality level of households is predominantly at a low level, i.e. without thermal insulation, without good completion with different installations and equipment;
- ❖ Level of social life is quite poor, i.e. there is neither organized social life nor facilities for its organization;
- ❖ There is an organized system of education but only at the lowest education level. Schools are in rather bad state, not properly equipped and without properly resolved system of financing;

PRECONDITIONS 3

- ❖ There is no strategy of development of the region, necessary for an organized approach to concrete actions. Region is treated as a part of the wider region of Strumica but without detailed investigations of concrete influencing factors and without a defined set of problematics and necessary actions to improve the present situation;
- ❖ Region is rich with natural beauties but there is no organized activity for their preservation or use;
- ❖ Region is rich with animal and vegetation species which can be treated as rare or with need for protection. However, they are not properly registered and systematized and, due to that, without any concrete activity for protection;
- ❖ There is no organized approach to environmental problems of the region and, in that way, no organized activity for its protection and improvement of the present situation.

PRECONDITIONS 4

All listed influencing factors have been investigated in details and it was found that space for composition of a specific strategy for development, based on the natural and other possibilities of RES introduction in different life sectors and their programmed development. Different technical and organizational possibilities have been put in very different combinations in order to reach the most feasible and economically justified solutions. Finally, the best determined combination has been investigated in details, i.e. optimal technical and organizational solutions have been determined, as they are presented in this report.

PROPOSED PROJECTS



**Geothermal hotel and spa complex
“Tsar Samuil” in Bansko**



PROPOSED PROJECTS 1

Development of a water supply system for 1.320 ha of land in the lower part of the region

- ❖ The area is very poor with natural water flows, which exists only during the early spring, when snow in the mountain is melting and natural rainfall is rich. Later on there is no regular supply of water which can be used for irrigation or drinking water. On contrary, the subsoil level of water is very high and can be regularly used for irrigation purposes due to the fact that is with convenient chemical composition and clear of organic components.
- ❖ Completion of 56 boreholes is planned, enabling to cover the area with a regular network for water supply. Initially, pumping by diesel or electricity driven pumps is planned. After the completion of the biodiesel production plant, all the pumps shall be driven by biodiesel mixture.

PROPOSED PROJECTS 2

Anticipated method of irrigation is the sprinkler or drip system, accommodated to the requests of the plant rotation. The distribution of the water will be by pressure pipes with sufficient head to operate both, the sprinkler and drip systems. Composition and all the necessary elements of the distribution system and irrigation systems are determined.



PROPOSED PROJECTS 3

❖ 3. Crop rotation

Rotation of oil beet, wheat, soya and tomato/ paper are accepted as most convenient to all the locally influencing factors.



PROPOSED PROJECTS 4

❖ 4. Biodiesel production

Based on the planned production of 663.300 kg/yr soybean and 858.000 kg/yr oil beet, completion of a biodiesel production plant with capacity of 112.800 kg/yr biodiesel is planned.



PROPOSED PROJECTS 5

5. Briquetting the wood residues

Based on the local wood economy from forests on the Belasica mountain, collection of the waste wood is planned and then its briquetting for local and foreign market supply. Capacity of the briquetting unit in Murtino is 786,7 t/yr and in Kuklish 2.290 t/yr as raw material and 685 t/yr and 1.955 t/yr as final product.



PROPOSED PROJECTS 6

❖ 6. 2 new geothermal boreholes completion

2 new geothermal boreholes, one with capacity of 60 l/s and temperature of 70-80 °C, and one of 70 l/s and temperature of 80-120°C is planned. That is more than tripling the existing borehole capacity of 55 l/s and temperature of 70 °C.



PROPOSED PROJECTS 7

❖ **Recompletion of the existing district heating system**

Reorganization and recompletion of the existing district heating system is planned in order to enable technically and economically proper exploitation of the source.



PROPOSED PROJECTS 8

❖ Introduction of solar energy use for sanitary warm water preparation

Organized installation of 650 completes should enable a significant increase of the living facilities standard in the region and should open the door for further development, either in public buildings or residences.



SITE VISIT



**Small bar in the hotel complex
“Tsar Samuil” in Bansko**



INTERESTING OFFER AND POSSIBILITIES



**Geothermal swimming pool in the
Hotel “Tsar Samuil” in Bansko**



ECONOMIC ASPECTS 1

❖ WOOD BRIQUETE PRODUCTION PLANT

The financial rate of return is 36% (repayment period 5 years) and 45% (repayment period 10 years), higher than the discount rate (15%), which means that the project will realize more incomes than costs, i.e. the investment is profitable.



ECONOMIC ASPECTS 2

❖ **PROJECT FOR CONSTRUCTION TWO BOREHOLES**

The financial rate of return is 92% (repayment period 5 years) much higher than the discount rate (15%), which means that the project will realize more incomes than costs, i.e. the investment is profitable and investment will be return for short period.

ECONOMIC ASPECTS 3

❖ BIODIESEL PRODUCTION PLANT

Considering the fact that the operational costs are higher than the incomes, this project is not profitable.

The 87% of the operational costs are consisted of costs for oil seed (soybean) and oil beet (rape-seed). It means that the basic raw material for realization of this project is too much expensive.

ECONOMIC ASPECTS 4

❖ CONSTRUCTION TWO BOREHOLES

During the whole repayment period of 5 years, the project shows net profit with tendency of growth from year to year.



ECONOMIC ASPECTS 5

- a) About 50% increase of permanent jobs**
- b) About 30% increase of temporal jobs**
- c) Expected economic changes shall change the present wellbeing and self-confidence of the population. Except the feeling of life without chances and poverty, hope for stabile and economy and future shall appear and, with that conditions for keeping the population in the region, i.e. to stop the emigration.**

CONCLUDING COMMON DINNER



Excellent working but also very friendly atmosphere

SOCIAL ASPECTS 1

- ❖ **Introduction of central heating in residencies in Bansko, shops and public buildings in all the villages, regular supply of warm tap water in Bansko from geothermal origin and in the other villages from solar energy, organization of recreational centres, etc. Together with the tourism development, better supply with food and other products. Also better road connections.**
- ❖ **Appearance of new regular jobs shall by itself increase the quality of life of inhabitants.**

ENVIRONMENTAL PROTECTION

- ❖ **Realization of the strategy results with significant improving of the environmental protection of the region, i.e. :**
- ❖ **Air pollution : Due to the absence of industry in the region, quality of air is quite high. However, it can be expected significant positive influence by wider introduction of geothermal energy in tourist sector and residencies and, with that, removing the use of fossil fuels. The same with introduction of solar water heaters.**
- ❖ **Preservation of forests : Introduction of controlled collection of wood residues and programmed growing of new woods shall improve the state of existing and development of new forests.**

DISCUSSION

After the project presentation, discussion of present decision makers was mainly concentrated to the possibilities to implement all the proposed projects.

From their side, particularly by the mayor of Strumica, full support has been promised and active contribution to all necessary activities.

Information get by ETA (Munich, Germany) about the available source of financing has been followed with particular interest and more detailed written information requested.

Finally, the project team has been informed that full political consensus to support the project implementation has been reached in the municipality.



SITE VISIT

After the end of the workshop, participants visited the agricultural field of Murtino and the village of Bansko, where main part of the projects is planned to be located.



**Ruins of the old Roman spa in
Bansko**



CONCLUSIONS

Composition of the IRES scheme has been estimated as optimal according to the natural, economic, social conditions and need of the communities of Murtino and Kuklish.

Local municipality fully support the Project results and shall do all what's Necessary to enable its implementation.

Firm collaboration of participants in its implementation is of paramount Importance for its successful implementation.



FAREWELL



**Successful end of the project should
Be confirmed with collaboration in
Its implementation.**

