



# SWOT REPORT

## **Project BETTER “Biofuel chain Enhancement for Territorial development of European Regions”**

*(Project Code 5D013)  
within the framework of the INTERREG III B  
CADSES Neighbourhood*

*Edited by:* Adam Kupczyk, Institute for Renewable Energy (EC BREC IEO Ltd)  
*in co-operation with* Piotr Pawelec Podkarpacka Energy Management  
Agency Ltd



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**The report has been created as a result of:**

- a discussion quietened by Piotr Pawelec (PAE- Podkarpacka Energy Management Agency Ltd)
- two meetings had taken place in PAE, Rzeszów - 6<sup>th</sup> and 20<sup>th</sup> of November 2006, participants of which, in alphabetical order, were:
  - Marian Drzał (MSc)
  - Adam Kupczyk (PhD, asst. Prof.)
  - Jacek Łapiński (PhD)
  - Mieczysław Majcher (PhD)
  - Jan Mańka (MSc)
  - Piotr Pawelec (MSc)
  - Grzegorz Ślusarz (PhD)
- country context report
- methodology proposed to partners of the BETTER project at the Kick of Meeting in Forli, Italy in June 2006 by Adam Kupczyk, asst. prof. The methodology has been sent by e-mail to partners by project co-ordinator as a presentation entitled: „Only.....a little BETTER method to make SWOT analysis for BETTER – Project”.

**The SWOT report accomplished within the BETTER project**

**The analysis of transport biofuel sector development  
(rape fuel) on the Podkarpackie province**

**Warsaw, 11 December, 2006**

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## 1. Introduction

During last decades, since the first report published in 1972 for the Club of Rome in particular and first energy crisis that took place in early 70-ties, last century, the interests in renewable energy resources (RRE) has been increasing, including the transport biofuel produced in biomass conversion process. The interest is resulted from a number of premises, most important of which are:

Ecology aspect, shrinking natural resources of mine carriers and its price rise at the world market, in result energy safety threat of countries (economic blocks e.g. EU) that do not possess sufficient recourses of their own; social aspect- in a result of science and technological progress, the overproduction of food released the significant areas of cultivated land, that could be used for energy plants growing, what, additionally, will reinstate workplaces in country areas.

Since the beginning of mankind existence there has been increase in quantity of energy consumption along with economic development (economic system). In recent decades the escalation of natural environment degradation and energetic demands is shown as an exponential function.

That being so, energy, ecologic, and regional EU policy gave high priority to renewable resources of energy, including transport biofuel. In political and law resolutions it is clear that EU has integrated approach towards solving the problem of lack of energy safety, environment protection and country area development, what is reflected in “White Book” accepted by European Committee in 1997: *energy for future: renewable energy resources* and caused the, so called, Green Book –the European strategy for energetic safety, drawing up at the end of 2000.

The beginning of current decade resulted in two important EU directives within the range of:

- the electrical energy from renewable resources promotion at the European market of electrical energy; 2001/77/EC directive;
- the transport biofuel promotion( the 2001 project accepted in 2003), 2003/30/EC directive, this report is concerned about.

**Since the initial reluctance towards top-down enforcing of biofuel (e.g. Acts of law) the approach to the issue has been changed; all biofuel initiative should be down-top, and at most supported by the government, parliament, or EU.**

## **2. Methodology<sup>1</sup>**

This report is another step in work on the BETTER project, which uses the SWOT method to work out the assumptions of strategy for liquid biofuel sector development, based on rape on the Podkarpackie province area. Since the features of rape oil produced for own purposes sector, for open sale and, planned to be developed, biodiesel sector are similar (strengths, weaknesses, opportunities and threats), and the three of those are treated of together.

The SWOT analysis helped to choose one of the four strategies: (maxi-mini, mini-maxi, mini-mini, and maxi-maxi) and short- and medium-term recommendations.

To complete this report the secondary sources has been used.

## **3. Aim and range of report**

The main objectives of this report are:

- the short description of the Podkarpackie province
- the SWOT analysis of the production chain of biodiesel for Podkarpackie region on the basis of:
  - the Context Report previously prepared for the BETTER project
  - materials collected together with Energy Agency of Podkarpackie and the expert circle from Podkarpackie region: Mr Mieczysław Majcher PhD, the head of Experimental Breeding and Plant Acclimatization department in Ożańsk; Mr Marian Drzała, the head of Agriculture and Agricultural Market department of the Province Office in Rzeszów, Mr Grzegorz Ślusarz, PhD engineer, the Dean of Economy Department of University in Rzeszów; Mr Jan Mańka, the president of Producers and Oil Plant Processors Association of Podkarpackie Region
  - data base of EC BREC IEO Ltd.
- identification the kind of strategy arose from SWOT analysis.
- indicating the major strategy objectives of biofuel chain management on the basis of SWOT analysis

## **4. Short characterization of Podkarpackie province**

The Podkarpackie province is located in South and East part of Poland, borders Slovakia and Ukraine. The map of the province is shown at the pic.1.

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<sup>1</sup> Kupczyk A., Only.....a little BETTER method to make SWOT analysis for BETTER – Project, IEO EC BREC, Kick of Meeting, Forli, Italy July 2006



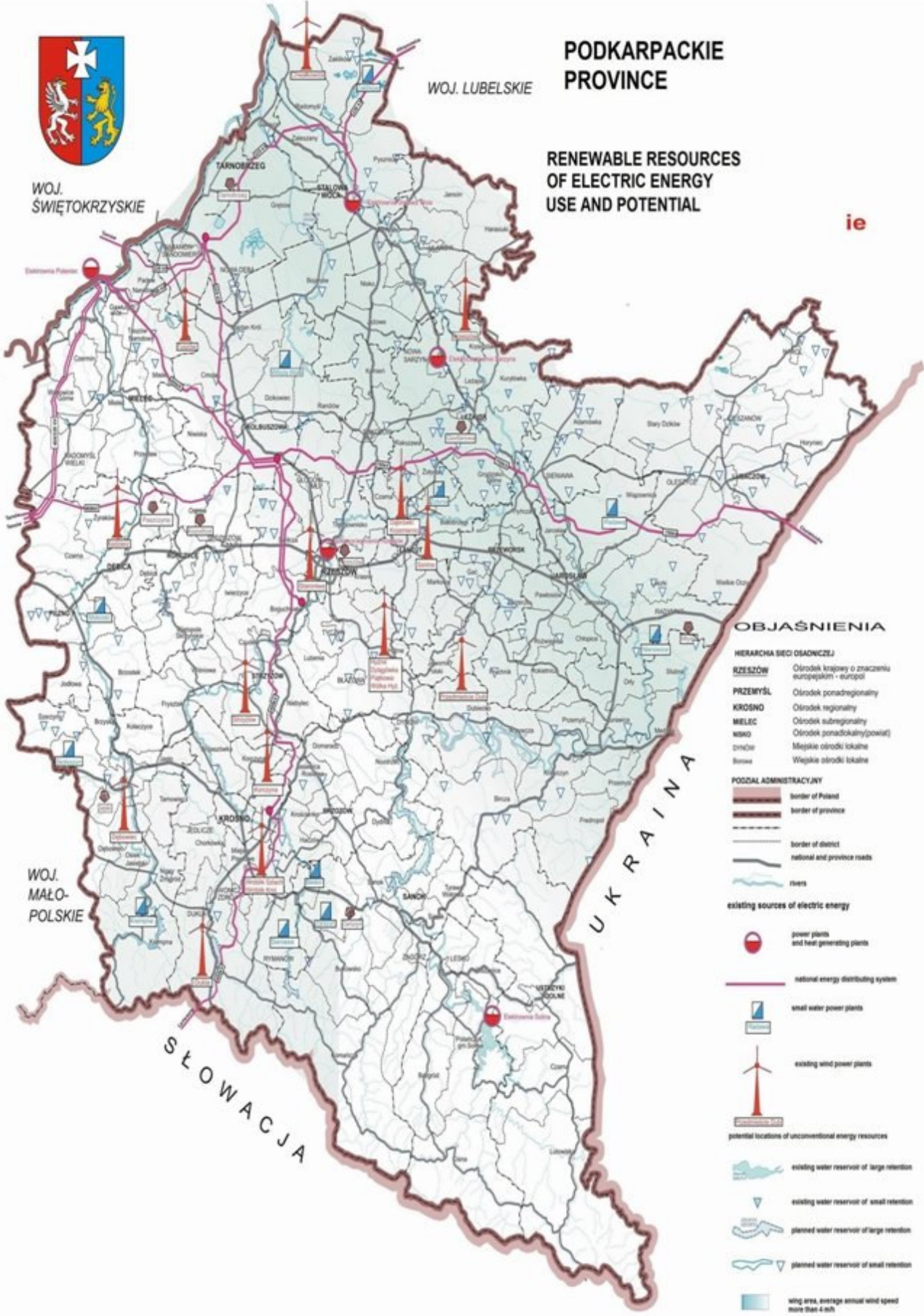
WOJ. ŚWIĘTOKRZYSKIE

WOJ. LUBELSKIE

# PODKARPACKIE PROVINCE

## RENEWABLE RESOURCES OF ELECTRIC ENERGY USE AND POTENTIAL

ie



### OBJAŚNIENIA

- HIERARCHIA SIECI OSIĄGNIĘCZ**
- RZESZÓW** Ośrodek krajowy o znaczeniu europejskim - europol
  - PRZEMYSŁ** Ośrodek ponadregionalny
  - KROSNO** Ośrodek regionalny
  - MELEC** Ośrodek subregionalny
  - MSKO** Ośrodek ponadlokalny (powiat)
  - DRYNÓW** Miejskie ośrodki lokalne
  - BORUS** Wiejskie ośrodki lokalne

- PODZIAŁ ADMINISTRACYJNY**
- border of Poland
  - border of province
  - border of district
  - national and province roads
  - rivers

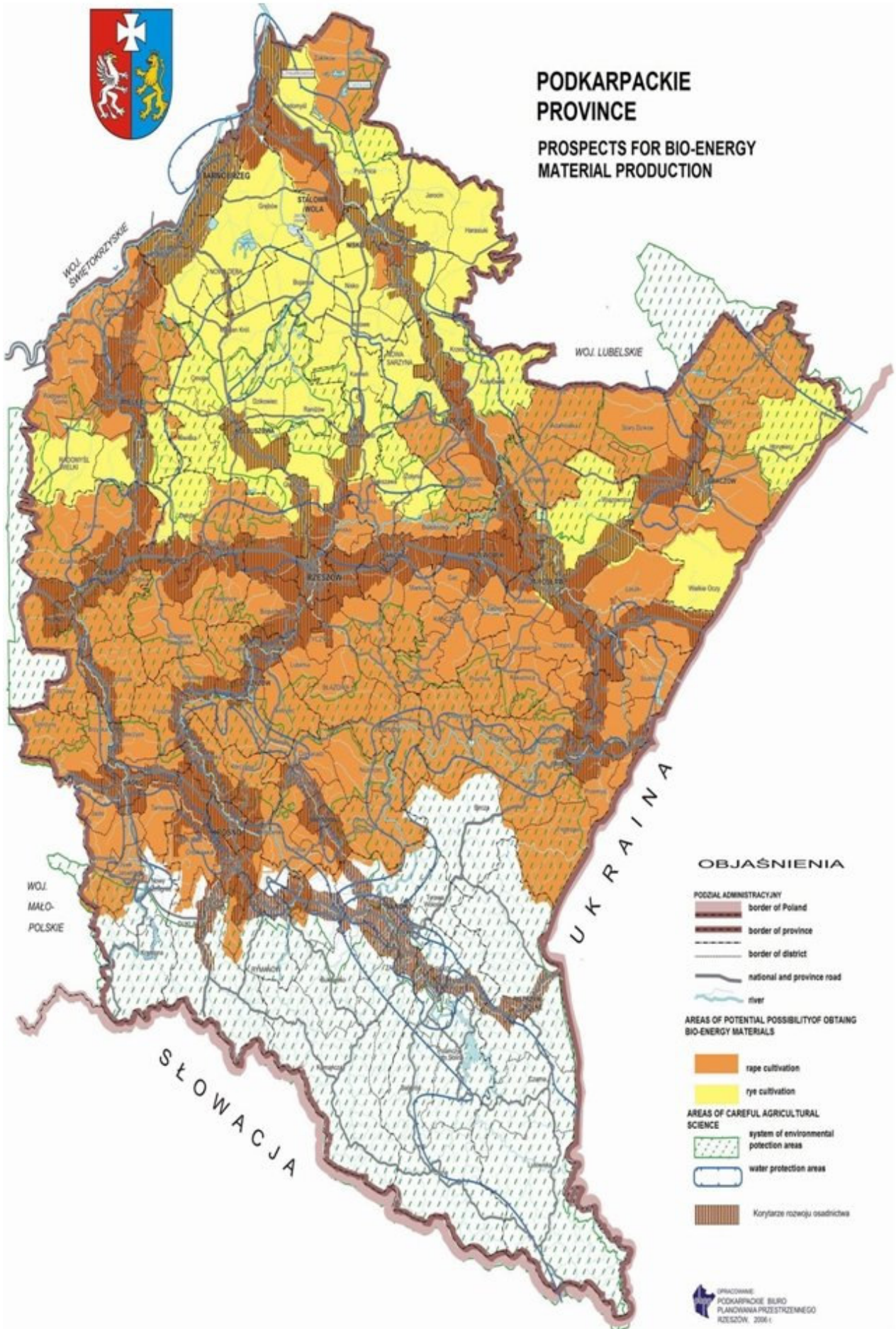
- existing sources of electric energy**
- power plants and heat generating plants
  - national energy distributing system
  - small water power plants
  - existing wind power plants

- potential locations of unconventional energy resources**
- existing water reservoir of large retention
  - existing water reservoir of small retention
  - planned water reservoir of large retention
  - planned water reservoir of small retention
  - wind area, average annual wind speed more than 4 m/s
  - factory of waste material utilization in project



# PODKARPACKIE PROVINCE

## PROSPECTS FOR BIO-ENERGY MATERIAL PRODUCTION





The population of Podkarpackie province is app. 5% of Polish population (the average is about 7% per province) therefore this province has less citizens than other.

The national average is almost 2565 zł/month. The average salary in Podkarpackie province industry is app. 2130 zł gross per month, that is only 80% of national average salary.

The registered unemployment is lower than national average.

The rate of Podkarpackie province industry production for sale is only 50 % of production for sale in statistic Polish province.

The electric energy production (per inhabitant) in Podkarpackie province is much lower than national average (1,36 MWh while national average is - 3,95 MWh per year).

In Podkarpackie province the rate of renewable resources energy (RRE) production in total production of energy is low: 0,47 kWh while the national average is 7,73 kWh

The use of electric energy per inhabitant is app.1,9 MWh per year, the national average is 3,2 MWh per year.

The price of purchase of electric energy in this province is the highest in Poland.

The Podkarpackie province uses the small amount of heat when compared with average use per inhabitant in other regions in Poland.

Poland has large resources of biomass (the material for RRE production), with relatively large energy self-sufficiency. Energy dependence of Poland is not higher than a dozen or so.

Podkarpackie region is rich in biomass resources for RRE production, especially concerning the forest and agricultural biomass.

## Simplified valuation table of RRE resource potential of Podkarpackie province

| kind                     | valuation |
|--------------------------|-----------|
| Wind power engineering s | ● ● ●     |
| Solar energetics         | ● ● ●     |
| Geothermal energetics    | ● ●       |
| Waterpower energetics    | ● ● ● ●   |
| Biogas                   | ●         |
| Biomass                  | ● ● ● ●   |

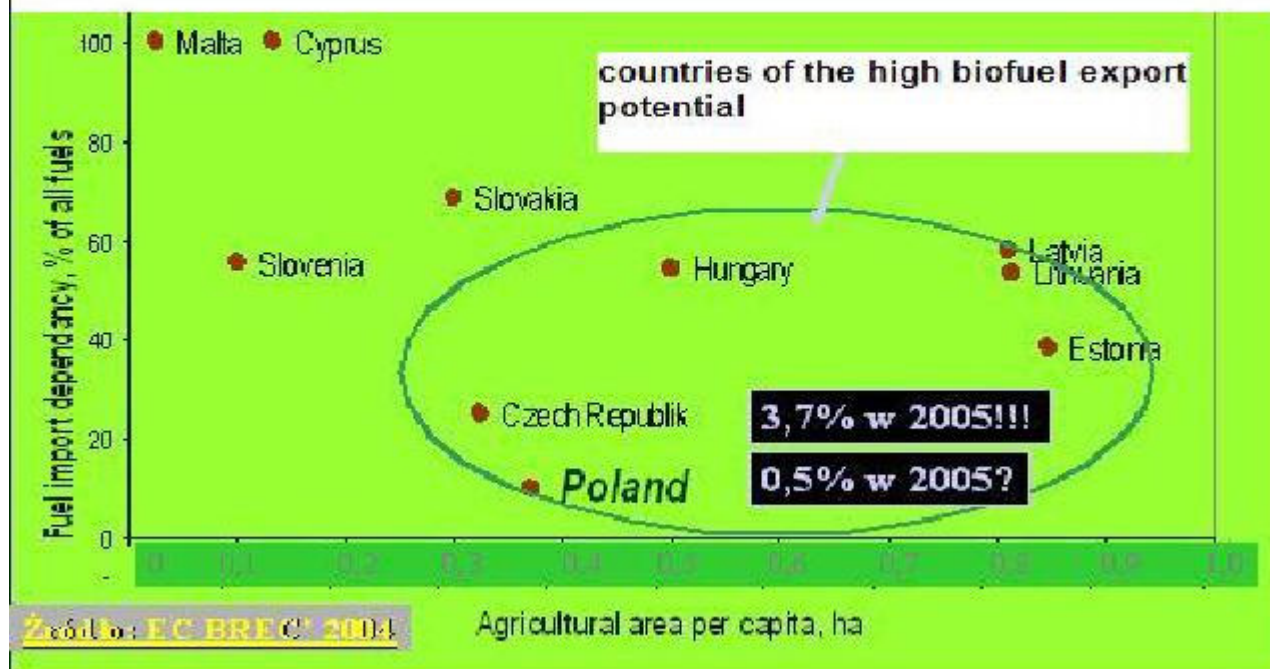
Scale: ● ● ● ● - very good, ● -poor

According to preliminary valuation (the table above) in Podkarpackie province there is very large resource for the following RRE production:

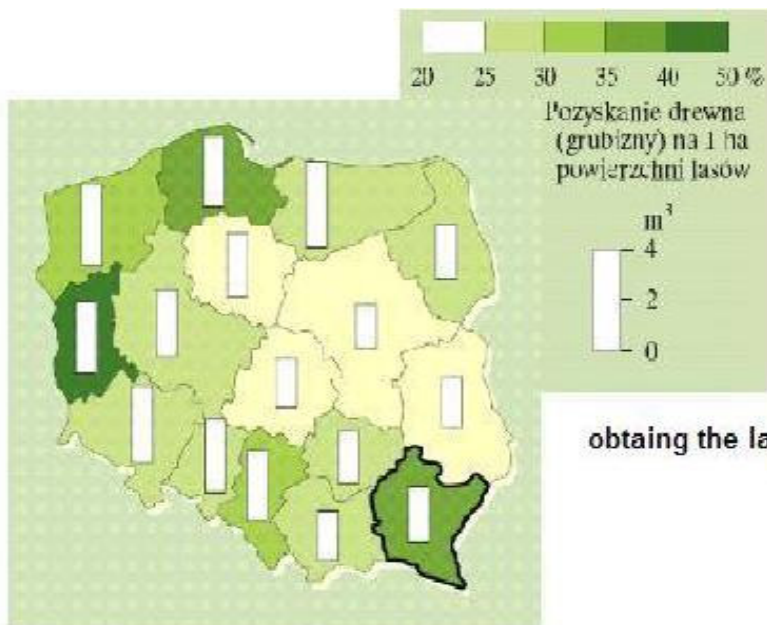
1. water power engineering
2. biomass energy (combustion, transport biofuel)
3. solar and wind power engineering.

The dysfunction is the relatively small area of a farm in contrast to other provinces.

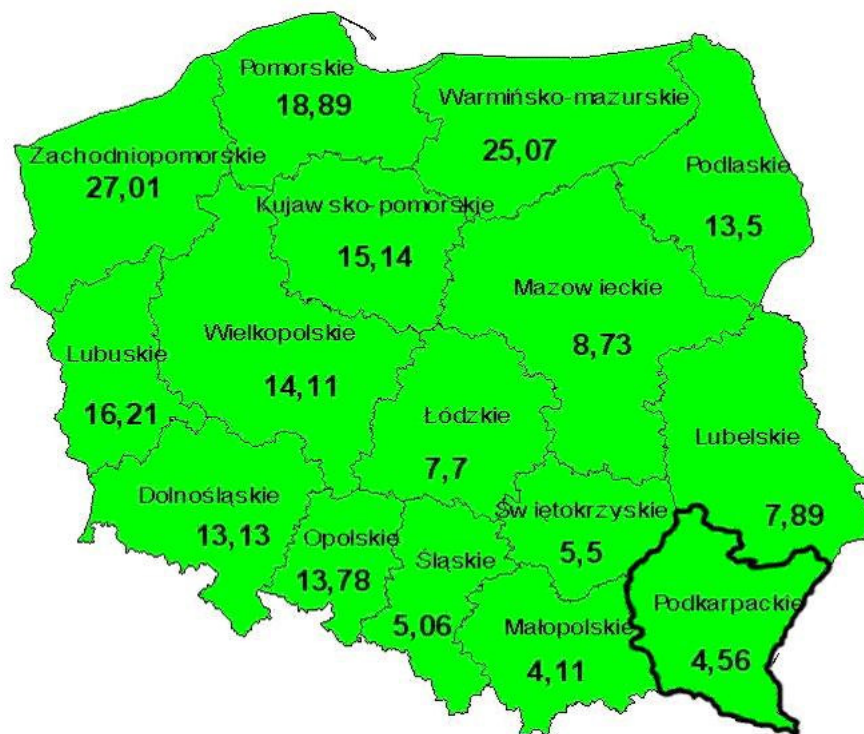
**chances for biofuel in Poland; 27,3 mln ha are forests and agricultural lands (90% of the surface area of the country)**



Pokarpacie region is highly afforested in comparison with other provinces



obtaining the large timber from 1 ha of forest



average farm surface in Poland (more than 1 ha)

## 5. The SWOT analysis for production chain of rape biofuel

The table below there contains the major indicators suggested by experts, having influence on rape biofuel production chain development in the Podkarpackie province.

Table: the SWOT analysis of biofuel production chain in the Podkarpackie province.

| S  | W   |
|--|---|
| <ul style="list-style-type: none"> <li>- there are favourable climate and environmental conditions (esp. high quality of soil) to rape cultivation in the Podkarpackie region</li> <li>- large , unexploited production potential of agriculture and rural areas (resource of land and workers)</li> <li>-possibility of assign large areas of appropriate soil for rape cultivation</li> <li>- possibility of gradual filling the gap after resigning from sugar beet or other, unprofitable, cultivation</li> <li>- the prospects of reducing the area of waste land</li> <li>- low charges and surplus of manpower ( competitive price of rape and rape oil),</li> <li>- the custom of rape cultivation in he part of the province</li> <li>- the demand for the product (rape) from the local processing industry</li> <li>- producers organizations connected to the issues of rape processing chain(production-processing, purchase-distribution)</li> <li>- the rational rotation and improvement of soil productive quality has been understood</li> <li>- existing production plants for rape processing into oil ( processing capacity of the</li> </ul> | <ul style="list-style-type: none"> <li>- distraction (scattering of a sector) of rape oil production</li> <li>- intercepting part of farmers' income by agents working on the market ( purchase is made by external subjects)</li> <li>- threat of unverified varieties of rape appearance on the market</li> <li>- predominance of the reluctant attitude among the farmers( small farms owners) and rural inhabitants- low level of education among the agricultural producers</li> <li>- the current technology used gives lower oil yield (30% in comparison to competitive 35%) what lowers the competitiveness of the product</li> <li>- high purchase price of rape</li> <li>- banks are not engaged in supporting the rape processing and purchase in the Podkarpackie region</li> <li>- slow processes of adjusting to changing developmental conditions( low rate of restructuring in the region)</li> <li>- low capital resources of farmers</li> <li>- distant relation of farms with the market ( the unmarketable farms mostly),</li> <li>- lack of entrustment and common reluctance towards joint venture( undeveloped social capital)</li> </ul> |

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| <p>order of 30 thousand of tons per year)</p> <p>machines installed have the following features:</p> <p>small space for work;</p> <ul style="list-style-type: none"> <li>- low electric energy usage,</li> <li>- high efficiency of work</li> <li>- no air pollution,</li> <li>- low costs of operating and keeping in</li> <li>- technical readiness state</li> <li>- long overhaul life between medium repair, that is 1000 tons</li> <li>- low price</li> <li>- good users opinions</li> </ul><br><ul style="list-style-type: none"> <li>- uniformed fleet– all rape producers work with the same installations</li> <li>- normalized product is being received : <ul style="list-style-type: none"> <li>- oil</li> <li>- oilseed cake</li> </ul> </li> <li>- cold press method -preferences of delivery– hot pressing gives worse physical chemical product parameters <ul style="list-style-type: none"> <li>- constant recipients– provides steady sale</li> </ul> </li> <li>- efficient advisement in rape cultivation and sale area,</li> <li>- functioning producer group</li> <li>- well developed system of rape purchase</li> <li>- existing rape processing plants</li> <li>- flourishing non-governmental organizations of RRE promotion and development</li> <li>- well developed system of agricultural advisement</li> <li>- the ability of obtaining funds for projects</li> </ul> | <p>-large young educated people migration, (the human capital deciding of the competitiveness of the region)</p> <ul style="list-style-type: none"> <li>- the partnership between public and private sectors is not developed in the region</li> <li>- self-government and inhabitants are not satisfactory educated in abilities and needs of development and using the renewable resources energy</li> </ul> |
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|---|---|
| <p>from EU or other non-governmental resources</p> <ul style="list-style-type: none"> <li>- large experience in realization of projects connected with RRE</li> <li>- large advantages of natural environment in this region</li> <li>- large scientific potential( universities can support the innovative production development and the usage of biofuel)</li> <li>- giving the priority to developmental strategy for Podkarpackie province in 2007-2020 and Regional Operating Program of Podkrpackie Province for 2002-2013</li> </ul>  |   |
| <p>O</p>  | <p>T</p>  |
| <ul style="list-style-type: none"> <li>- the necessity of respecting the rules of balanced development( the basic horizontal rule in regional structural policy of EU) in every pro-developmental activity</li> <li>- growing meaning of ecology aspect in Poland as well as in the world, evolution of interest in quality configuration and protection of environment (enforced the limited content of harmful substances in fuel)</li> <li>- ensuring the energy safety in Poland and EU</li> <li>- shrinking amount of work places as a result of globalization; biofuel give new work places</li> <li>- stable growth of demand on energy and energy carriers ( exponential character of demand and destruction of environment)</li> <li>- priority given to RRE and biofuel in EU,</li> </ul> | <ul style="list-style-type: none"> <li>- numerous transport biofuel substitutes, including traditional fuel and alternative and New generation fuel( heading towards hydrogen generation)</li> <li>- bariery rozwoju sektora biopaliw transportowych stwarzane przez uczestników sektorów paliw tradycyjnych i sektora motoryzacyjnego,</li> <li>- relatively high price of transport biofuel production in EU in comparison e.g. spirit in Brazil or to costs of output of the barrel of crude oil (8-12 USD/barrel)</li> <li>- problems with EN14214 norm in case of biofuel produced for own use (limited advantageous ecological effect)</li> <li>- insufficient profitability or lack of it(production profitability appears in case of larger production scale)</li> <li>-improving the image of 1<sup>st</sup> generation biofuel</li> </ul> |

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| <p>establishing the quantity aims</p> <ul style="list-style-type: none"> <li>- the 2003/30/EC directive recommendations have not been fulfilled in Poland so far, in EU- on the average level</li> <li>- dynamic evolution of ester sector in Poland , in EU and in the world</li> <li>- creating the legal condition for producing transport biofuel by farmers or own purposes, mercantile or the B10 fuel(20% of esters)</li> <li>- new excise directive will guarantee at least four years of reduction</li> <li>-the wide promoting action is planned to happen (including special act of law)</li> <li>- Poland has the large biomass resources in contrast to EU</li> <li>- biodiesel is being more interested in than bioethanol (in case of esters- sector is in growing phase; in bioethanol case –shaped and rejuvenated phase- the try of switching into one phase technology)</li> <li>- changing the position of biofuel in social perception(biofuel is backed by authorities, largest companies produce biofuel, biofuel car racings, models of car adjusted to biofuel are produced in most car companies, favourable image created in media)</li> <li>- a support of the whole political arena for biofuel</li> <li>- the governmental and EU support for R&amp;D initiative concerning transport biofuel</li> <li>- EU and Polish government financial</li> </ul> | <p>demands incurring high costs necessarily</p> <ul style="list-style-type: none"> <li>- uncertainty of sale constance, seasonal sale in case of esters</li> <li>- uncompleted legal environment ( revision of the excise directive causes anxiety).</li> <li>-unsatisfactory RRE promotion,</li> <li>-energy and fuel companies monopoly (controlled access to distribution channels) - development of large companies (out of the region) basing on bio-material (reducing the province to material producer only)</li> <li>- dynamically evaluating market of biocomponents able to eliminate ‘small material producers’</li> <li>- import of biocomponents to biofuel production</li> <li>- higher competitiveness of producers from other regions</li> <li>-limited access to fund for biofuel market development</li> <li>- not efficiently developed business supporting structure</li> <li>-unsatisfactory cooperation between economy practice and theoretical works</li> <li>- low fund on the R&amp;D area in Poland in contrast to other EU countries</li> </ul> |
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|---|--|
| <p>support for biofuel production( rants on the score of energy plant cultivation</p> <ul style="list-style-type: none"> <li>- supporting the local initiatives and creating condition to development of enterprising in rural areas</li> <li>- stable or even growing prices for rape and rape oil</li> <li>- relatively large costs of traditional fuel(gas, diesel oil) and the harmful influence on environment of theirs combustion</li> <li>- vast amount of by-products after traditional fuel</li> <li>- growing interest in energy carriers from renewable resources</li> <li>-small rate of biocomponents in fuel being sold in Poland</li> <li>-dynamically growing market of biocomponents</li> <li>-overproduction of food (necessity of using the agricultural products differently from eatables)</li> <li>- tools of Common Agricultural Policy for supporting multifunctional development of rural areas and alternative source of income</li> <li>- supporting the research on biofuel</li> </ul> |  |
|---|--|

On the basis of information collected, it is concluded that the biofuel production chain in the Podkarpace region exists already; it needs only to be strengthen and finalized (the lack of final link-ester factory)



## 6. Strategy identification

On the basis of numerous factors (more opportunities than threats, and more strengths than weak factors) one can state, that in case of the Podkarpackie province, the MAXI-MAXI strategy is suitable. Main features of maxi-maxi strategy for rape transport biofuel sector are: strong developmental expansion, capturing new markets and sectors, innovations, investing, creating the condition of competitive supremacy, and promoting.

## 7. Chosen elements of strategy of transport biofuel sector development in the Podkarpackie province.

**Table: elements of strategy of rape biofuel production chain in Podkarpacie region**

| <b>Descriptive variables</b>          | <b>Expansion strategy</b>   |
|---------------------------------------|---|
| <b>The strategy aims</b>              | <p>-The long term development of transport biofuel sector (rape fuel: oil and esters), using the favourable notational and international (EU) legal conditions, sharing the financing of development too.</p> <p>-The biodiesel sector is not finalized and needs to be completed-lack in the production area.</p>  |
| <b>Additional aims(profits)</b>       | <p>-possibility of obtaining additional profits by farms</p> <p>-possibility of creating new work positions</p> <p>- ecology aspect</p> <p>- making better use of production potential</p>  |
| <b>Attitude towards activity risk</b> | <p>-acceptance of medium risk; quite comfortable condition while the government undertakes the vast part of financial responsibility</p>  |
| <b>The investment range</b>           | <p>-Large outlay- ester production on open market</p> <p>-Small outlay- oil and ester production for own purposes</p> <p>-Farmer-investor lack funds, obtaining funds from special credit lines, national budget or EU grants (taking advantage of existing competent organization e.g. OAE, agricultural market government agency, etc.).</p> <p>-Vast investments are necessary into:</p> <ul style="list-style-type: none"> <li>- R&amp;D area (cooperation with research centres e.g. Technical University, RADZIKOWA FILIA PEŁNA NAZWA)</li> </ul> |

|  |  |
|--|--|
|  | <ul style="list-style-type: none"> <li>- gradual narrowing of the sector and in time specializing as a result(scale effect)</li> <li>-R&amp;D – the cost of obtaining new varieties of rape</li> <li>- education of the farmers (rape is demanding plant for professional cultivation)</li> <li>-more efficient and productive equipment for rape production and processing</li> </ul> |
| <b>recipients</b>                              | -Oil production for own purposes( esters in future) or for external recipient (e.g.Trzebinia refinery); local experts claim that it is advisable to limit the sale of rape-oil out of Podkarpackie province  |
| <b>Typical product and diversity decisions</b> | -Narrowing the diversity, oil of the particular quality-selected rape variety and a way of pressing  |
| <b>The price decisions</b>                     | -Prices will be established due to the product quality   |
| <b>The distribution decisions</b>              | -Taking advantage of already existing distribution channels, development of producer group, narrowing the vertical diversification ( whole amount of rape produced is used for the Pokarpackie province needs as rape oil, furnace oil, and, in time- when ester plants are built , esters   |
| <b>Typical sale promotion decisions</b>        | -Promotion at the local, national, and EU level;<br>-Intensification of the promotion in order to stimulate the demand, creating or improvement of production  |
| <b>trainings</b>                               | -R&D centres, branch experts, universities and colleges, Agricultural Advisory Centre, EU agricultural unions and organisations, vocational trainings from EU funds  |