

Conditions of transport biofuel production and usage in Poland in contrast to UE

Executive summary of the Country Context Report¹

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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 sources (RES) has been increasing, including the transport biofuel made in biomass conversion process. The interest is resulted from a number of premises, most important of which are:

-Ecology aspect- increasing threat for natural environment as a result of common and intensive combustion of mine energy carrier or usage the derivatives in combustion process in combustion engines. The ratio of transport in global CO₂ emission and environment degradation is app. 18 % (passenger transport, other means of conveyance).

-Shrinking natural resources of mine carriers and its prize 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. The bargain power, economic and political status of countries rich in energetic carriers (Russia, Arabic countries) has been strengthening.

-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 and more over reinstate workplaces in country areas.

Since the beginning of mankind existence there has been increase in quantity of energy usage 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 granted high priority to renewable energy resources, including transport biofuel. In political law resolutions it is clear that EU has integrated approach towards solving the 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.

The quantive goals of biofuel usage in EU and Poland.

The part of transport in EU energy needs has been growing with relatively low abilities to product self-supplying with traditional, transport carriers, the crude oil derivatives (diesel fuel, gas). In 2000 the part of fuels used for transport was app. 32,4% (309 Mtoe) of total European demands (the final energy requirement). According to that, the large interest and urgent need appears towards searching the alternative transport fuel, with biofuel ranked among those. Biofuel is recognized as a fuel containing biocomponents. That is gas with over 5% addition of ethanol or at least 15% addition of ETBE, and crude oil with over 5% content of esters. The transport fuel containing smaller amount of biocomponents, under the current law, is not considered as a biofuel, but undergoes excise exemption that has been foreseen for biofuel.

One of the crucial element of 2003/30/EC directive were, so called, quantity aims of biofuel usage, accepted by EU board and outvoted by EU parliament. According to directive recommendation, the biofuel² (biocomponent) rate in transport biofuel usage structure of EU membership countries-“25”, when energy counted, supposed to come not less than 2,75% in 2006, and not less than 5,75% in 2010 (table 1)

Table 1. The minimal biocomponent share in total use of transport fuel according to 2003/30/EC directive demands, in energy (e) and volumetric (v) aspect.

specification	The year					
	2005	2006	2007	2008	2009	2010
Directive settlement-the part of bio-components (e)	2,00	2,75	3,50	4,25	5,00	5,75
Bio-ethanol (v)	3,20	4,41	5,61	6,81	8,01	9,21
ETBE (adjusted to a bio-ethanol) (v)	6,82	9,37	11,93	14,49	17,04	19,60
Esters (v)	2,12	2,92	3,71	4,51	5,30	6,10

The table 2 shows the fuel and biofuel usage in Poland and energy indicator of biofuel usage.

² The rate is adjusted to 100% biocomponent

Table 2. The transport fuel usage and biofuels share in Poland

The year	Transport fuel (In thousand of ton of gas equivalent)	Biofuel		The energy rate of biofuel in total fuel energy used
		Bioethanol (thousand of ton of bioethanol)	Biodiesel (thousand of ton of esters)	%
2000	7184	40,6	-	0,35
2001	7046	52,4	-	0,46
2002	7049	65,3	-	0,57
2003	7547	60,1	-	0,49
2004	7847	38,3	-	0,30
2005	7715	42,2	13,4	0,48
2006**	-	-	-	1,5

*own calculations using not finite data** forecast

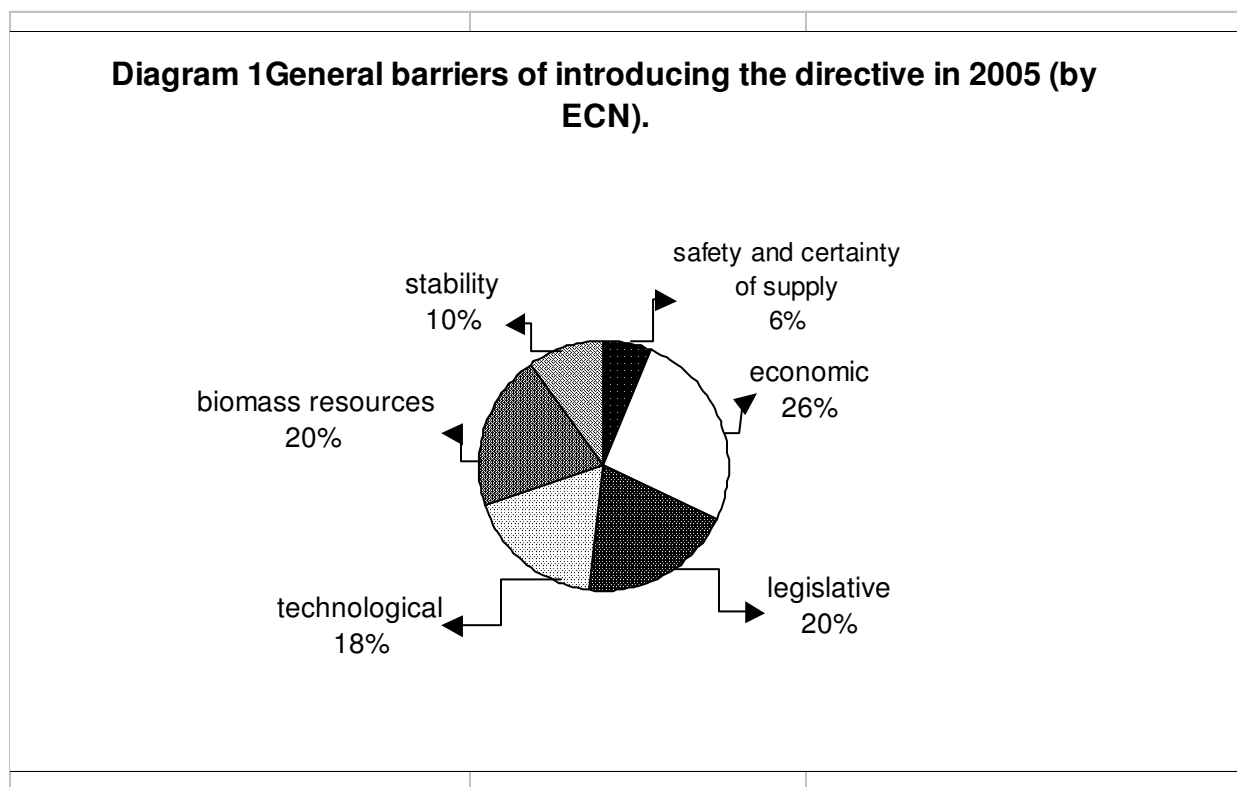
Almost half of percent (0,48 %), that Poland had reached in 2005, is only the fourth part of EU demands reflected in 2003/30/EC directive. However the directive has a suggesting character, and none of the membership countries did raise reservation according to its quantity aspect, some of the EU clerks signalize the possibility of consequences being imposed on membership countries-including new members- in case of not applying the directive recommendation.

During numerous conferences on transport biofuel the Economy Department and Agriculture and Rural Development Department representatives announced:

- in 2006 the biofuel(biocomponent) rate in transport fuel structure will be 1,5%(2,75% according to 2003/30/EC directive recommendation)
- in 2007-2,3%
- in 2010, the 5, 75%- the quantity aim of directive will be reached or even exceeded(which is the realistic prognosis, according to authors of this report, because of investments being realised, ready to use in 2007-2009, among others) .

Barriers to introducing the 2003/30/EC directive and using the transport biofuel.

The low usage of transport biofuel in EU countries resulted in research on barriers which have influence on the present situation³. Barrier has been divided into general barriers (diagram 1) and detailed barriers (diagram 2).



Main barriers are to be found in economy, law and fiscal, and technology aspect, and limited sources of biomass.

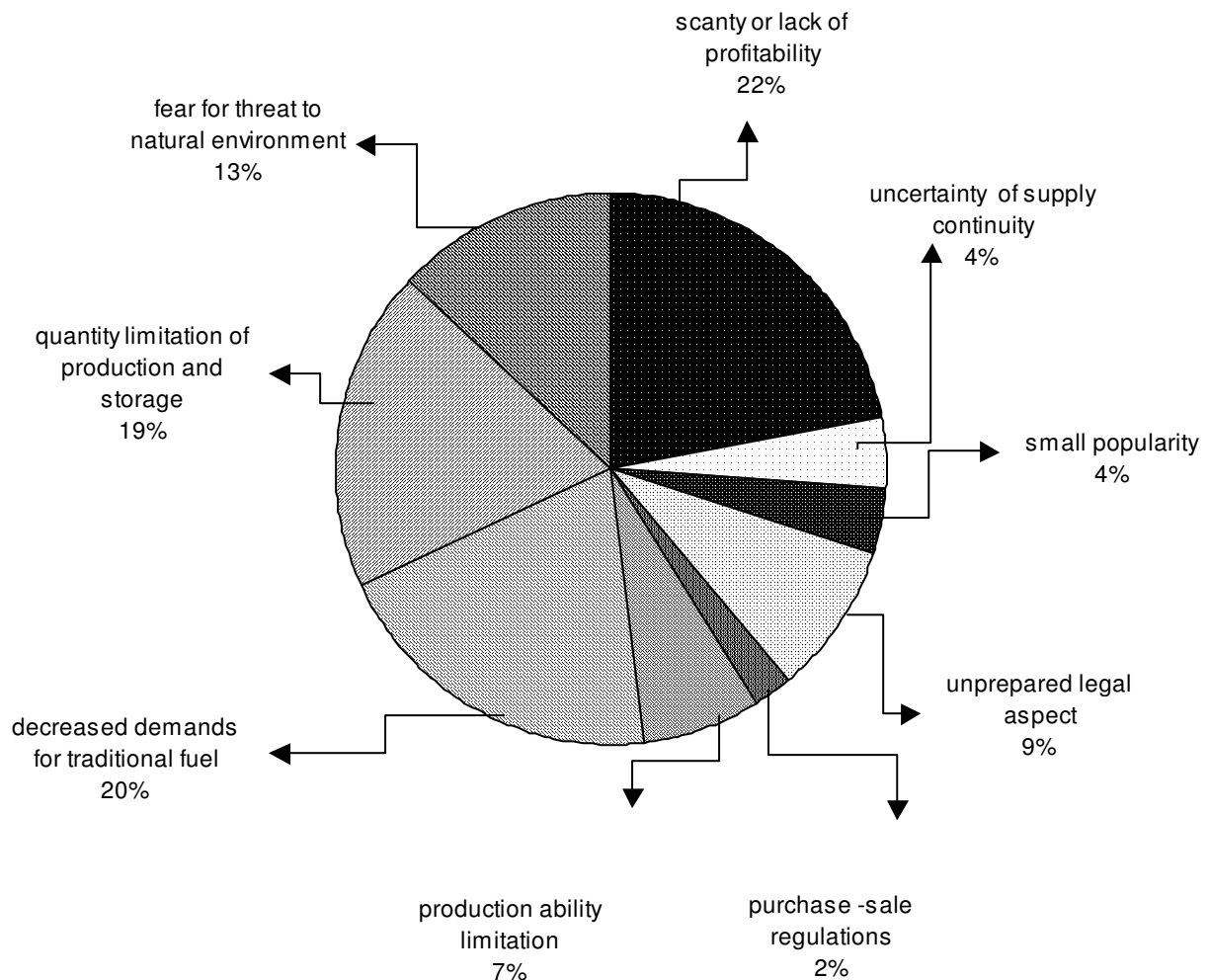
In Poland, the barriers are similar, but the biggest problem of biocomponent production sector seems to be the law and connected to it economy aspect. The material problem does not exist in Poland so far, for:

- there is a large supply for bioethanol production in Poland
- there is small demand on material (rape) for ester production in Poland, since the sector is in the initial and rise phase.

Detailed barriers to introducing the 2003/30/EC directive in EU are shown at the diagram below.

³Research done on EU countries that did not reach the recommended energetic rate of transport biofuel usage for 2004

Diagram 2 Detailed barriers of introducing the directive in 2005 (by ECN).



Global aspect.

The global aspect of transport biofuel sector in Poland changes gradually; new law regulations arise, controlling the production and the market; biofuel gains social acceptance due to its prize and environmental issues. Changes in Poland, as far as biofuel is concerned are partly imposed by international law regulations. The table below shows briefly changes in global aspect of transport biofuel sector in terms of Polish membership in the European Union.

Table.3 The global aspect of transport biofuel sector.

General aspect	Before Polish participation in EU	currently
Legal aspect	<p>Since 1999/2000 the arising phase; significant disturbances connected with liberal- and pro-consumer organisations reluctance towards biofuel act,</p>	<p>A number of law acts and directives has been created in conformity with EU regulations, allowing the biocomponent production and supporting the biofuel sector activity for market (large production plants) as well as for non-market producers(closed merchant groups, farmers, producer groups)</p> <p>A B10 fuel ha appeared on the Polish market(it contains 20% of esters in diesel oil); its legal sale is shaken not only in Poland but also in EU, although some countries were able to negotiate the sale of biofuel content between 5% and 100% of biocomponent (e.g. in Sweden –E85 contains 85% of bioethanol, used in flexible engines)</p> <p>The law connected with excise exemption will be changed soon; probably the excise reduction threshold will be lifted or the excise could be reduced in relation to the kind of biocomponent ; the period of reductions will be enlarged (now it is regulated annually by Finance Department, the proposition of guaranteed reduced excise period is at least four years).</p> <p>Creating the favourable legal and economy climate for biofuel at the government level for biofuel produced on a large scale (fulfilling the EN 14214 norm) as well as for those produced for own purposes, not fulfilling the EN 14214 norm(different legal regulation has been created , advantageous for both groups)</p>

		There is a biofuel promotion law act to be created.
Social aspect	The media offensive against biofuel; social reluctance towards biofuel	<p>Acceptance of fuel with biocomponents due to lower prize, smaller environmental threat, possibility of production for own purposes in a farmstead if activity is registered, and possibility, although illegally—the user is supposed to pay excise tax to the appropriate tax office, of adding cheaper, raw oil to diesel oil</p> <p>Taking the growing energetic crisis into consideration and all that is mentioned above, the media do not attack the idea of substitution traditional fuel by biofuel in an aggressive way any more, instead it is presented as a business for chosen investors in our country, investing in the biofuel sector and for customers.</p> <p>There is a biofuel promotion system at the central level, and the act of law concerning the biofuel promotion created.</p> <p>Round the world biofuel is promoted by pop stars; there are biofuel racings organized, in Poland as well.</p>
International aspect	<p>Relatively low crude oil prize, in relation to biofuel/biocomponents</p> <p>The Kyoto report, later the 2003/30/EC directive,</p> <p>Recommending reaching the biocomponent usage ratio:2% in 2005, and</p>	<p>Significant increase in crude oil prize since the middle of the 2005, up to 70 \$ per barrel in 2006; increase of natural gas prize and other carriers; political disturbances, wars at the crude oil output areas.</p> <p>In EU membership countries gradual reaching the biofuel/biocomponent usage ratio included in the 2003/30/EC directive.</p> <p>The energetic audit, which is to do within the year, will show the kinds of sanctions are to be</p>

	5,75% in 2010.	<p>imposed against the countries that do not fulfil the directive commitments.</p> <p>Countries which are in possession of large amounts of crude oil, natural gas, coal, or uranium can wield strong influence on international and economic politics(e.g. embargo put on developed countries by Arabic Countries)</p> <p>The equal treatment of substitute fuel by European Committee: liquefied petroleum gas, natural gas, hydrogen(produced from biomass as well as from coal or uranium energy conversion)</p> <p>The natural environment impurities reduction profits.</p>
Political aspect	Every subsidies or excise reduction, indispensable for agriculture or biofuel development, were criticised by liberal organisations	All the political arena support for biofuel/biocomponents.
Technological aspect	<p>Bioethanol technology had been already settled in Poland; vast amounts of ethanol were added to fuel since postwar period; from the beginning of 90-ties the bioethanol had been used.</p> <p>The industrial production technology of esters had been bought from Germany.</p>	<p>Large interest of investors in ester production technology purchase exceeding the country production abilities of adequate quantity of material-rape</p> <p>The necessity of special kinds of rape for fuel sector.</p> <p>Problems with ester production of an appropriate quality and their storage for a longer time (EN 14214).</p> <p>Possible minor producers problems (up to 30 thousand tons of esters per year) with the quality of their product, which is to fulfil the EN 14214</p>

	<p>Start-up phase in 2004.</p> <p>Before some insufficient, R and D installation had been working (e.g. Mochelko).</p>	<p>norm.</p> <p>The seasonal type of use (during very low temperature season the use of esters is not possible, the ester containers should be heated during wintertime).</p> <p>One need to be very careful with methyl ester production for methyl alcohol used is poisonous</p> <p>The EU interests in biomass conversion into biofuel (biofuel of a 2nd generation) technology leading to hydrogen production in the future (including bio-hydrogen-the fuel of a 3rd generation).</p> <p>Possible disturbances connected with the biofuel production waste material on a large scale.</p> <p>New waste and semi-product management technologies are arising.</p>
Economic aspect	<p>Gradual growth of GNP and large budgetary deficit, unemployment reaches the 20 %</p> <p>Introducing biocomponents on a larger scale, using the excise reduction (1,5-2,2 z/l accordingly to the part of biocomponent in the fuel), results in national budget losses</p>	<p>The dynamics of GNP growth increase, decline of unemployment to 17%,an agriculture growth and financial support are one of the EU priorities, together with joint agricultural policy and biofuel investments.</p> <p>In some countries the biofuel investments are up to 50% subsidized with public assets; Poland tends to solve this problem as well.</p> <p>The excise exemption for biofuel limits the budgetary income but declines rural unemployment, increases profitableness, and gives chances to backward areas.</p> <p>According to Department of Finance representative the biofuel production profit exceeds the income budgetary losses.</p>

source: from own research