SOME ASPESCTS OF EUROPEAN CLIMATE POLICY

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Abstract: ***Being heavily energy dependent, it is not much of a surprise that Europe pays special attention to reducing the use of fossil fuels. Each one of the ten new member states is characterized by relatively low per capita energy consumption and relatively low energy efficiency, and the share of renewables in their energy mix tends to be low, too. The paper examines the problem, when the policy measures create a decrease in environmental capital instead of an increase. In this case it hardly seems justified to talk about environmental protection.***

The authors describe a case of a rapeseed oil mill which would not be of too much interest on its own but given that almost all similar plants went bankrupt, there are some important lessons to learn from its survival. The enterprise the authors examined aimed at establishing a micro-regional network. They completed a brown-field development to establish a small plant on the premises of a former large agricultural cooperative. By partnering with the former employees and suppliers of the sometime cooperative, they enjoyed some benefits which all the other green-field businesses focusing on fuel production could not. The project improved food security, energy security and population retention as well.

Keywords: renewable energy, game theory, sustainable development in rural regions, EU climate policy

I. UNRESOLVED PROBLEMS IN EUROPE AND IN HUNGARY

We have examined the Hungarian legislation and environmental performance from an European perspective The IMD in Switzerland publishes yearly a competitiveness report, in which they evaluates the country's performance in many dimensions. Based on the ranks we can create clusters according the difference between the overall and the environmental performance. There are five group of European countries:

To the first group belongs countries like Sweden, Austria, Switzerland, where the overall performance is good and the environmental performance is excellent. In this countries not only the so called eco-efficiency is high but the environmental assets like arabic land per capita and the urbanisation level are favourable. So they have good environmental assets. (The ecological footprint is not too big.)

To the second group belong countries where the overall performance is in harmony with the environmental performance like Denmark, France, Germany, Italy. In all this countries the favourable natural environment is combined with a relatively lower level (in European term) of population density and urbanisation.

The third group contains countries like Hungary, Spain, Poland where the environmental performance is much better than the overall performance, what is the "gratis effect" of the under development and the favourable natural circumstances (fertile soil, low urbanisation level etc.)

The fourth group contains totally different countries with relatively good overall but weaker environmental performance like Norway, UK, Belgium, Netherlands, Ireland. In this group the problem mainly not the week environmental management, in most cases the high population density and/or the overgrowth economy (high per capita energy consumption), the high level of urbanisation are typical.

The fifth group of countries, where both the overall performance and the environment are unfavourable. In this cases, the environmental infrastructure is weaker like in Greece, or in the Czech Republic.
It would be a mistake to over evaluate the reliability of the above mentioned data, but interestingly one can see some correlation
Historically EU environmental policy has mostly had the declared objective of integrating environmental policy with other sector policies. The relatively "autonomous" role assigned to environmental policy does not necessarily lead to a weak system, although it does mean that if the economy as a whole fails to support the objectives set forth by that policy, then environmental policy is doomed to failure.

EU environmental policy has moved from direct 'command and control' regulations to the declared objective of subsidiarity and, by now, it is employing the entire gamut of control mechanisms, the system of 'voluntary agreements' being one of its more recent additions. Early government policies, as almost all measures at the birth of the environmental protection, were reactions to specific crises. In other words, like the measures themselves, environmental policy at that time was 'reactive' in character. While 'end-of-pipe technologies' will most likely remain irreplaceable for some time to come in areas such as environmental rehabilitation, sewage or waste treatment, a 'reactive environmental policy' is always the result of a backward political system. In Hungary, the biggest problem, besides a poorly developed institutional structure, is a distrust of already functioning institutions.

In the table below we collected the major characteristics of the **two 'basic approaches' to environmental policy on the macro level**:

characteristics of...	"reactive env. policy"	"preventive env. policy"
government control	sector-specific, ministry of the environment	the env. ministry playing an integrative, co-ordinating role
problem management	differentiated by env. media and nature of pollution	integrated, holistic
control tools	command and control: penalties, product charges, user charges, subsidies	environ-friendly tax system, voluntary agreements, EMAS, early warning and emergency systems, educational campaigns
foundations of environmental economics	Pigou's theory of the internalisation of negative externalities	Coase, and theory of institutional economics
typical activities of env. bureaucracy	inspection, punishment, licensing, damage control	planning, co-operative problem solving, professional expertise
technical solutions for the protection of the environment	"end-of-pipe" technologies	cleaner production and consumption methods
financing	central budget, allocated funds	private sector, local government, foundations
measuring effectiveness	env. expenditures in % of GDP, % of pollution reduction	welfare indicators (ISEW, HDI), biodiversity index, public awareness, changed life-style
time-line of results	temporary, superficial, appearing in the short run	lasting results, appearing after some delay
participation of stakeholders	within a closed circle, 'greens' are the enemy	broad-based, civic groups as partners
environmental sector	developed env. industry and counselling system	educational programmes, information systems, clean technology advisors

Remarks: the table contains only those tools and theories that have already seen practical application.

The two extreme positions are never manifested in their pure form in practice, they always overlap at some point; the phenotype of the system is determined by the frequency of occurrence and the weight of constituting elements.
The transition between the two stages of development is full of contradictions. On macro, as well as micro level, development is hindered by existing structural factors. On the micro level, managers are reluctant to risk replacing well functioning (e.g. profitable) technologies under given circumstances, an understandable position when seen from the point of systems-theory. On the macro level, at the same time, the environmental policies of developed nations are rather ineffective. Although environmental trends in efficiency point in a positive direction, there are no signs of real improvement in absolute terms. It is precisely the failure of the system that should spur change on the macro level, yet it is the present structure itself that resists any movement. And the failure of 'reactive environmental policy' is evident both in the legal and economic spheres. In practice, even rigorous theory resists application. In addition, a number of elements making up EU environmental

policies cannot stand up to theoretical analysis. For instance, some of its basic assumptions, such as the principle of 'polluter pays', can only be accepted on moral grounds, but often lacks economic rational. It is well known that on occasion protection against harmful effects by the 'victim' would be more economical, in which case the principle of 'polluter pays' harms the Pareto optimum.
It would be easy to prove with numbers that in Hungary development projects, financed by incomes from fuel product charges (i.e. catalytic converter programme, the phase-out of two-stroke engines) have contributed to increased motorisation and the decline of mass transit and, instead of reducing, have actually boosted per capita fuel consumption. If we consider anticipated difficulties attending the recycling of used auto parts, coming up in a few years, the programme's environmental equation is even more discouraging. Many may assume that we are mismanaging these programmes. The problem lies somewhere else, however; it is the entire concept of 'reactive environmental policy' that creates these unintended results.

In all developed countries governments reacted to environmental problems with encouraging the emergence of an independent environmental ministry. In institutional terms this has led to a contradiction. Environmental policy which, we are convinced, should be integrated into economic and other sector policies, is segregated and downgraded, eventually becoming one of several sectors of the economy. Turning environmental issues into an industry is a natural 'developmental deficiency', the result of a functional division of labour. Environmental policy should attempt, more than anything else, to slow economic expansion, to work out and support, with the help of pressure groups, economic activities that reach their target by reducing per-unit fuel consumption and raw material requirement, while keeping economic activity within the regenerating capacity of the natural environment.

Due to its separate function, the success of the ministry of environment is measured by the size of redistributed resources (budget revenues) it receives and the effectiveness of its lobbying efforts. However, in this context its vested interests lie in propagating pro-expansionist forces. Does it mean that voices questioning the legitimacy of an independent environmental ministry are correct? With the present administrative structure the elimination of the environmental ministry would be a mistake; its presence strengthens efforts to protect the environment, competing successfully with other areas (i.e. health care, social welfare, etc.) for the scarce resources.

As a result of these contradictions the environmental ministry and the protection of the environment do not necessarily share the same interests. A reactive environmental policy actually favours the emergence and implementation of sector interests. The environmental bureaucracy, the nascent and growing environmental industry all strengthen the ministry's lobbying power, making more funds available for environmental protection (end-of-pipe variety) which, in the final analysis, do end up benefiting the environment itself.

In contrast, the lobbying power of a preventive environmental policy is considerably more limited. Improvements in the environment in this case are not simply due to the efforts of the environmental sector. In a preventive system the environmental industry remains weak and lacks independence, fewer budgetary resources come available for environmental projects and the ministry loses some 'respect' which, in the public eye is tied to the size of its budget. It is hardly reasonable to expect the environmental ministry, after early successes promoting the interests of its sector, to support a 'preventive environmental policy' that, while increasing its socio-political influence and efficiency, would ultimately leave it in a 'weakened position'.

Looking at the problem from the point of system-theory and sector interests, it is clear why in their response to the EU questionnaire different ministerial departments were motivated in painting such a negative picture of the state of the environment. At the same time the positive image presented concerning enforcement issues and the development of the institutional system is equally unrealistic. The discrepancy in responses on the state of the environment and institutional structure

can be explained quite easily: for ministry officials the state of the environment is something beyond their control, caused by outside forces, by 'polluters'. The establishment and improvement of institutional structures (including legal instruments) is the responsibility and competence of the Ministry of the Environment and Regional Policy, its own 'brain-child', as it were. This is only to be expected; every institution has a more critical view of others' work and is inclined to put its own achievements in a better light.

NGOs are also pressuring the ministry to present the state of our environment in an unfavourable light. NGOs too have a vested interest in interpreting environmental indicators in dramatic terms. The bureaucracy, that once sharpened its claws in bargains over planning targets and regulatory policy and, lately, in budgetary skirmishes, hopes to take a larger 'bite' out of redistributed revenues and anticipated EU subsidies.

The negative image on the state of the environment, more than anything else, makes EU bureaucrats wonder how all needed infrastructure development and environmental rehabilitation projects could be financed. The favourable image on the institutional system, on the other hand, raises doubts about its efficiency - if the system works so well, why is the environment in such a poor state.

II. EU EFFORTS TO CONTAIN THE IMPACTS OF CLIMATE CHANGE

Being heavily energy dependent, it is not much of a surprise that Europe pays special attention to reducing the use of fossil fuels and to exploring and promoting the employment of renewable energy sources. In order to fight climate change, member states made the following commitments for 2020 at the European Council Summit of 8-9 March 2007[2]:

- Reduce carbon-dioxide emissions by 20 percent
- Improve energy efficiency by 20 percent
- Increase share of renewable energy in the EU energy mix to 20 percent
- Increase the share of biofuels to 10 percent

The decision was criticized even before it was made. Not only for being premature and lacking any and all background calculations but also because these amounts are simply not sufficient from a climate change point-of-view. Green NGOs (like Friends of the Earth) claim a 60-70 percent reduction in emissions is needed. According to the above-cited WETO project, Europe will only achieve 10 percent by 2050. The 20 percent reduction thus even contradicts the EU's own professional forecasts and what is more, is quite marginal in importance considering climate change. The best we can say about these commitments is that they might indicate that the EU believes climate change to be a real threat and that they are ready to make efforts to avoid a catastrophe. The Copenhagen Climate Conference did not bring anything new to the table, either. The only thing the world's countries could agree on was that they should keep making the necessary efforts.

European emission reduction achievements have been very contradictory. Table 2 shows commitments vs. actual data on the energy consumption and carbon dioxide emissions of fifteen countries (using a ranking of the top thirty).

[2] Data source: Presentation of Professor István Láng at Corvinus University of Budapest, April 2009.

TABLE 2: ENERGY CONSUMPTION RANKING OF CERTAIN EUROPEAN COUNTRIES (from amongst the first 30) SOURCE: Eurostat

	Per capita consumption	Consumption per unit GDP	Distance from carbon dioxide emission target	Share of renewables
Austria	19	5	18	4
Belgium	25	18	10	15
Bulgaria	6	29	5	28
Czech Republic	16	28	1	17
Denmark	17	4	11	2
Estonia	16	28	1	24
Finland	28	25	21	3
France	23	11	18	14
Germany	22	10	8	7
Hungary	8	17	9	26
Ireland	20	3	29	16
Italy	11	1	15	9
Latvia	3	20	2	22
Norway	27	12	19	10
Poland	5	22	6	20

It is quite apparent that the commitments mentioned, while requiring serious efforts from some of the countries, do not constitute a problem at all to some others.
Surprisingly enough, Finland, though usually considered a pioneer of environmental protection, lags far behind – not only because of its high per capita consumption but also because of its per unit GDP consumption. Something similar applies to Norway, as well, even though both countries boast very favorable advantages concerning renewable energy production thanks to their hydropower resources.
These rankings also confirm the well-known fact that rich countries tend to have higher per capita but lower per unit GDP energy consumption while the exact opposite applies to poor states.

These trends are not changed between 1997-2007 (Figure 1) and are not too much of a surprise, but according to Figure 1 and Table 2 the aforementioned ”uniform” commitment of the EU states is rather hard to interpret.

Each one of the ten new member states is characterized by relatively low per capita energy consumption and relatively low energy efficiency, and the share of renewables in their energy mix tends to be low, too. This situation clearly calls for energy policies which improve both energy efficiency and the share of renewables in the energy mix. It is not only carbon emissions but also energy security and the non renewable character of fossil fuel reserves which justifies increased interest in opportunities to employ biomass or wind energy. Many consider the renewable energy industry a potentially lucrative area for investment.

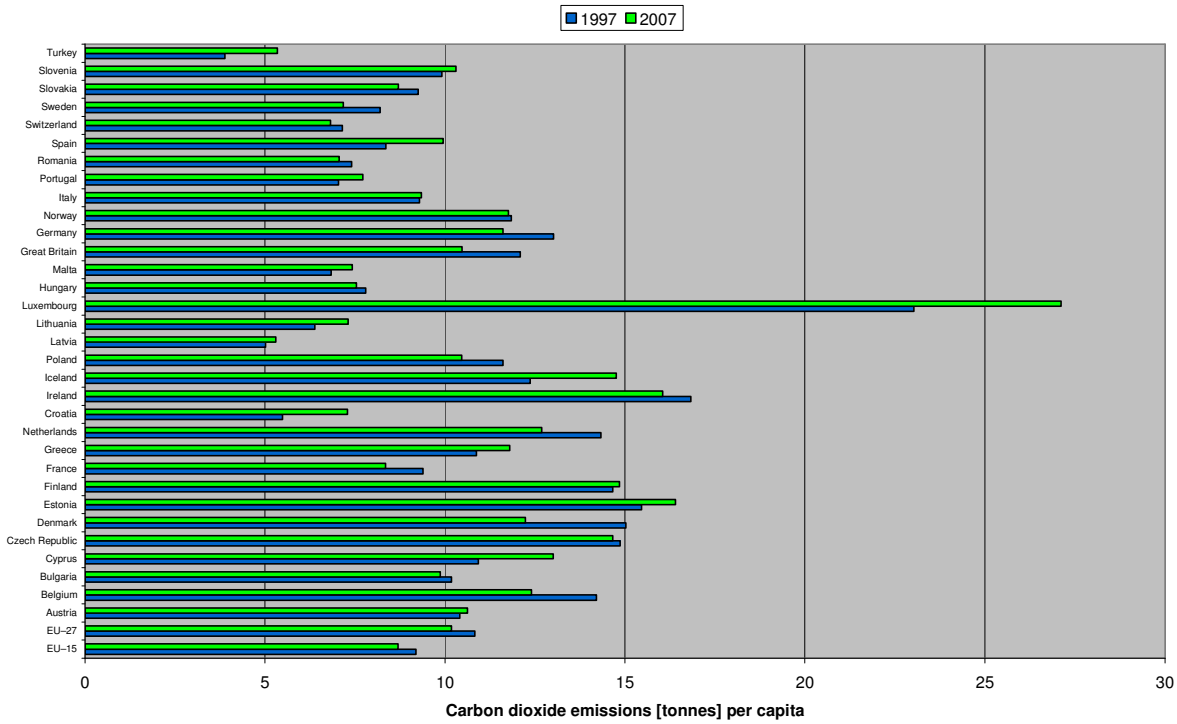

FIGURE 1: CHANGES IN COUNTRIES' PER CAPITA CARBON DIOXIDE EMISSIONS BETWEEN 1997-2007 SOURCE: Eurostat

III. DECISION DILEMMAS ABOUT RENEWABLE ENERGY SOURCES

All green NGOs find it desirable to support the spread of so-called "green energy", though there are debates about the exact details. Some opt for wind power, some for biofuels while others demand increased subsidies for geothermal energy production.

In table 3. we describe three cases which tend to divide the public. "Stakeholders" (entrepreneurs, government, NGOs and others) are all part of a so-called "decision game" and, not having read the book of János Neumann[3], they believe that the objective of the "game" is to win. Whereas one should rather decide first what kind of game they are actually playing. In our examples, the stakeholders and especially the government and the NGOs believe the game to be about environmental protection. Those in support of wind turbines, of increasing the mandatory bioethanol or biodiesel mixing rate and of the natural gas program are acting for a good cause by supporting environmental protection. Both the government and NGOs are convinced that the purpose of using renewable energies is to slow down the exhaustion of natural resources and to reduce the emission of greenhouse gases. Both of these objectives can be related to sustainable development and environmental protection. Thus the decision "game" appears to be about environmental protection. But is it really? Let us take a look at what the environment "gains" and how

[3] János Neumann and Oskar Morgenstern published their book „Theory of Games and Economic Behavior" more than sixty years ago in 1944. Even on its 60th anniversary it was only a very small group from the professional elite who celebrated the authors even though their work has revolutionalized economic thought. There have been many works from many authors on the economic applications of game theory ever since – but even today, it is the 'imperative to win' that springs to one's mind when games are being discussed. But the most important thing about any game is to know what type of game one is playing. Concerning environmental protection and sustainable development, it is very important for us, environmental economists, to ask ourselves the question: do we know what type of game we are playing?

environmental conditions improve through the use of wind power, bioethanol or a natural gas program.

TABLE 3: ENERGY AND CLIMATE CHANGE RELATED "GAMES" BETWEEN NGOS AND THE ECONOMY

Replacing fossil fuels or reducing their negative effects	**NGOs believe the game to be about…**	**The game is actually about…**
1. Biofuels	Renewable energies to slow down resource exhaustion, reduce carbon emission	Rural development, energy security
2. Wind generators	Renewable, no carbon dioxide emission	Utilization of drought areas, local energy production
3. Natural gas program	Improve energy efficiency, reduce air pollution	Supply security, reduce urban air pollution

It is apparent from Table 3 that "environmentalist" arguments for the natural gas program, biofuels or wind power plants are rather weak ones. Remember: all three solutions have received or are still receiving state subsidies which are labeled 'environmental'. Though any one of them might be useful under certain conditions, all three solutions are marginal innovations only, thus none of them should qualify for unconditional support irrespective of location, time and social conditions. Cost-benefit analyses could yield either a positive or a negative present value depending on the actual parameters. In all cases, results heavily depend on the framework within which they are evaluated.

If and when the measures introduced because of a given decision result in a decrease in environmental capital instead of an increase then it hardly seems justified to talk about environmental protection. The fault lies in the definition of the game itself – in the above cases and in many other situations as well. Mentioning pro-environmental arguments for bioethanol or biodiesel as renewable sources of energy is not exactly reasonable. 'Environmental protection' and 'automobilism' are paradoxical concepts already. One could, however, look into the effects of bioethanol production on employment or rural development and it is quite possible that both cultures along with their upstream industries could qualify for subsidies in that very framework.

The issue of renewable energy sources might be considered an "energy security decision game", accepting the self-sufficiency rate and import dependence to be strategic questions, thus the construction of wind turbines might turn out to be a reasonable choice in this very game. As an environmental protection decision game, however, no sound solution exists to this problem. If we wanted to turn the aforementioned solutions into economically sound choices, we would soon get to the issues of, in the case of bioethanol, GMOs and industry-like production systems, which are taboo to environmentalists (for good reasons, most probably). Wind turbines would lead us to thinking about water reservoirs like the one planned at Prédikálószék (plans for the hydroelectric power station Bős-Nagymaros included a pumped storage reservoir here in a site of natural beauty in Pilis mountains), and today's "greens" would for sure not be very enthusiastic about it either. All the above leads us to one conclusion: before participating in meetings to make decisions, we really

should consider what type of "game" we are playing and whether we have the necessary competence for the role. Since if we do not know the game or if it is not us who should be sitting there but we still happen to win - that will only bring trouble on all of us.

In Hungary, where there is hardly any wind according to scientific meteorological statistics, the actual installation of the already permitted wind power capacity of about 350 MW seems unavoidable, and investors' expectations are even estimated at several times this figure. Soon, the next "permit race" is about to start. An important question is: what would happen to the Hungarian energy system if, for some environmental/economic policy reasons, the government decided to leave alone the -apparently liberalized, but actually subsidy-driven- market?

As environmental economists, we are worried about subsidies for bioethanol and biodiesel production. No matter how hard we try to cover it up, these subsidies are definitely harmful from an environmental point-of-view. These subventions make fuel cheaper than it would be without them which indirectly fosters the expansion of automobilism – though it should rather be decreased worldwide, and even more so in Europe. It is a known fact that, in Hungary, the use of bioethanol as a fuel and bringing in wind turbines to the existing electricity system is only possible with strong and continuous state support.

The real price of energy itself is changing rapidly, yet recently we witnessed substantial price changes within relatively short periods of time instead of the usual few percent fluctuations. From USD 60 per barrel in February 2007 crude oil prices rose to USD 145 a barrel in July 2008. Then a downward trend followed with the price finally dropping to USD 30 in February 2009, yet again bouncing back to USD 70 per barrel by September 2009[4]. With oil prices above USD 100, pretty much any type of renewable energy seems competitive and rate-of-return calculations in the energy sector indicate incredible opportunities for innovation. Then energy prices had halved in a couple of weeks thus any previous calculations became invalid right away.

Accordingly, Europe and the world have seen the rapid spreading of corn and rape fields during the last two years. Processing plants also started to appear, and then the experiences of one single year turned previous evaluations upside down. And it was not only crude oil prices changing dramatically, but also, something "turned out" that has for long been known by many: biomass is sourced from where our food comes from, thus the two types of use are in competition. In 2008, bioethanol became very economic because of high crude oil prices and mandatory mix rates artificially fueled the market boom as well. Demand for corn-based bioethanol drove corn prices to heights which poor people could no longer afford, causing starvation in Mexico and in some other regions of the world. Sure enough, there are some who found other explanations. According to New Energy Finance, the use of grain for bio-fuel production "only" accounts for 8.1 percent of the total increase in food prices. As they put it: "In grains, during the period from 2004 to April 2008, global dollar prices increased by an average of 168 percent. The rising price of oil accounts for an increase of 32.5 percent and other inputs - such as land and labor costs - contributed 7.4 percent. Dollar depreciation accounts for a further 17.9 percent. Supply and demand imbalances account for the remaining 57.7 percent, with biofuels responsible for up to an 8.1 percent increase in global average grain prices (the impact on U.S. corn was clearly above average). The biggest issues were failure to improve yields to compensate

[4] Source: WTI Crude Oil Database: Cushing, OK WTI Spot Price FOB (Dollars per Barrel), http://www.eia.doe.gov/dnav/pet/pet_pri_spt_s1_d.htm

for global population growth, along with the failure of the Australian harvest". (LaMonica, Martin: 2008)

The evaluation we cited above did not really clear things up but rather provided further proof that averages tend to cover the truly important matters and that a universal energy policy cannot be right, not even in today's globalized world. An 8.1 percent average price increase does not seem too much, indeed, yet in some regions, it might very well be enough for some to die of hunger.

IV. Experiences from a successful alternative thinking business venture Energy production, rural development or …?

Back in 2007, the owners of an existing business decided to contribute to the EU renewable energies strategy: they founded a rapeseed oil mill for producing biodiesel raw material – a true model plant from a sustainability perspective. They employed an integrated approach to all the social, political and economic dimensions and ecological-environmental aspects and thus developed a tailor-made strategy for the given conditions. Sustainability was also accounted for in the location decision-making process. The primary objective was to find an agricultural region where a sufficient amount of rape could be produced in a 50-60 km range, as by minimizing transportation distance one can decrease both transportation costs and the burden on the environment.

As for all business ventures, profit maximization was the primary goal – but social and environmental benefits were also taken into account, knowing that in the long run, these would actually bring even more serious benefits for the business as well.

The plant started its activities in the renovated buildings of a former agricultural cooperative. Today, it has six employees. Thanks to the processing of 5200 tons of rape annually and related logistics needs, downstream employment benefits are significant. The plant now has a processing capacity of 430 tons of rapeseed in a month, which yields 150 tons (170000 liters) of rapeseed oil and 280 tons of rape pellet.

The plant we have been presented is located in Transdanubia and produces crude rapeseed oil, a raw material for biodiesel production. If it was not for the law, this oil could well be used to fuel agricultural and other machines or a power generator, thereby providing for the electric energy needed by the plant itself (i.e. a rapeseed oil-fueled generator). Oil sales constitute the majority of the plant's income. Rape pellet may serve as livestock fodder or be used in pellet stoves as well. Ideally, rape production, oil milling, livestock farming and the energy production infrastructure should all be within a 60 km range. Calculations suggest that approximately 5000 hectares of rape acreage is what it takes to operate an economically sustainable system. In such a case, there is no need for long-haul transportation and crop rotation becomes possible.

Following heavy fluctuations, the rapeseed market stabilized in summer 2009. The price for rapeseed settled at HUF 63000 per ton. Considering price and cost levels from 2009, the plant can be operated economically (as 3 tons of rapeseed yield 1 ton of rapeseed oil and 2 tons of pellets): (1 [t rapeseed oil] x 620 [EUR/t] x 270 [HUF/EUR]) + (2 [t pellet] x 37.000 [HUF/t]) – 3 [t rapeseed] x 63.000 [HUF/t] = 52.000 [HUF]

According to estimates by Oil World (AgroLine, 2009), the EU harvested a record amount of rapeseed in 2009. In 2010 the rapeseed crop totaled 20.12 million tons which even exceeds the previous year's record figure of 18.91 million tons.

In spite of the above calculations, there is no reason for optimism, as it is uncertain how over-production will affect the market. Neither do we know how slow or fast our

emergence from the crisis will be and how that will influence the crude oil market, which, as we have indicated earlier, fundamentally determines rapeseed oil prices.

TABLE 4: FLUCTUATIONS IN THE PRICES OF CRUDE OIL, RAPESEED OIL AND RAPESEED AS A RESULT OF THE CRISIS (2007-2009)
SOURCE: Compiled by the authors based on data from rapeseed oil millers

	Crude oil price (USD / barrel)	Rapeseed oil price (EUR / t)	Rapeseed price (thousand HUF / t)
July 2007	75	580	50
July 2008	145	1100	110
Dec. 2008	35	600	70
Sept. 2009	70	620	63

Rapeseed oil prices are closely related to changes in crude oil prices as it is shown in table 4. In July 2007, rapeseed cost HUF 50.000 per ton, while it was already HUF 110.000 per ton at the time of harvest. This figure is not that surprising when compared to rapeseed oil prices which rose from EUR 580 per ton to EUR 1100 per ton following a similar trend (they fell back to EUR 600 per ton by 2009 and are now around EUR 620 per ton). Experience from the last three decades suggests that it is advisable to buy up at least 50 percent of one's annual rapeseed requirement at harvest, when it tends to be the cheapest. This is what the present plant did: they bought up 3000 tons at HUF 110.000 per ton.

As a result of the outbreak of the financial crisis in August 2008, the price of rapeseed plummeted to HUF 70.000 per ton by December 2008, thus the change in the cost of raw materials alone caused losses of HUF 120 million [3.000 t x (110.000 HUF/t-70.000 HUF/t) = 120.000.000 HUF].

The problem is that such businesses are very seriously affected by any change in the world in the economic environment. Everything which is somehow related to agriculture in the European Union is heavily influenced by the EU's subsidy policies. But changes in energy prices, which are influenced by the operation of the economy as a whole, might well be dominated by factors far more powerful than agricultural subsidies – for example, the crude oil price fluctuations between USD 145 and 35 we witnessed during the last one and a half years. This was a strikingly high level of variability for a time span of only eighteen months, no sign of which appeared in any of the forecasts.

Fluctuations of the past three years have by far surpassed anything considered normal, even in the crude oil market – and they are completely new to the agricultural sector, as the costs of agricultural inputs used to be rather balanced. The price of biodiesel, however, is so closely bound to that of crude oil that any radical change in the latter ruins biodiesel initiatives as well. The majority of businesses in this sector are small enterprises, usually with strategic investors. The past two years have proved that businesses founded with the promise of high incomes and government subsidies in mind are doomed to quick failure when exposed to the vagaries of the rapidly fluctuating energy market. Such hectic market conditions could only have been survived by companies who had stable financial investors able to dampen these impacts and to hedge out some of the risks. Local entrepreneurs, having built their businesses on "agricultural potential", however, rarely have financial investment groups as investors. Because of their lack of capital, the immediate sale of the end product – rapeseed oil in this case – is an absolute must for them. Thus it may seem reasonable (only to the "sensibly minded" environmentalist, of course) to ask the question

"should production be considered 'local' if the factors for successful production are in the hands of global capital?"

The rapeseed oil mill we introduced would not be of too much interest on its own but given that almost all similar plants went bankrupt, there are some important lessons to learn from its survival. One of them is the existence of the aforementioned financial investor, allowing for a positive cash flow. Another point is that biomass energy production was not the sole purpose for founding this mill. Most rapeseed mills simply wanted to produce biodiesel raw material, thereby taking advantage of the EU policy prescribing the relevant mandatory mix rates, whereas the enterprise we examined aimed at establishing a micro-regional network. They completed a brown-field development to establish a small plant on the premises of a former large agricultural cooperative. By partnering with the former employees (now farming their own land) and suppliers of the sometime cooperative, they enjoyed some benefits which all the other green-field businesses focusing on fuel production could not. Its close relations with agricultural entrepreneurs guaranteed strong local support for the company. The project improved food security (livestock kept on controlled, locally produced fodder), energy security (public institutions heated with rapeseed pellet) and population retention (stable jobs) as well. This mutual cooperation is something rural people can make a living from. If they realize that livestock farming is worth considering, they might very well create the basis for the revival of rural farming activities. Cooperation provides for a win-win situation. Neither a rapeseed mill, nor livestock farming or biomass heating seems a promising project on its own, individually. As part of an industrial-ecological system, however, the undertaking as a whole can actually operate economically, and the countryside can also remain a place that is worth living in.

V. CONCLUSION

Recent years have showed us that the harmony between environment and economy lies with those smaller enterprises which offer significant employment opportunities and thus are desirable from a social point-of-view as well. Considering rural development purposes, bio-fuel production projects might well be worth supporting as they might provide employment for the rural population, improve population retention in these areas and aid in maintaining viable rural communities.

All the above leads to the conclusion that environmental issues require location- and time-specific decisions, thus international experiences alone are far from being enough. What is good for the US might cause starvation in Mexico. What seems favorable in Brussels might appear undesirable in Hungary, and, what is more, the use of land which perfectly fits the Great Hungarian Plain might turn out to be nonsense for the Transdanubian region. It might happen that rape production remains a rational choice both economically and ecologically for a couple of years, yet later on, it might become explicitly harmful along any one of these two dimensions, or maybe along both. This might seem to suggest leaving everything to chance or to the market (which are quite the same for many, by the way). But there is another possible conclusion: the need for flexible adaptation – a concept also re-discovered by literature, having received abundant coverage in recent years under the name 'resilience'.

Resilience stands for a decentralized or regionalized type of "planned economy", as opposed to the centrally-planned system we were used to until Hungary's transition –

memories of which we might happen to recall when faced with an EU bureaucracy trying to cope with its own managerial challenges. Walker Brian (2005)

The need for a sustainable relationship between nature and mankind requires us to focus on ecological flexibility as it primarily deals with the scale of opportunities between stabilization and destabilization: concerning our present development, concerning global environmental changes, the loss of biodiversity, degradation of ecosystems and concerning sustainable development.

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