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PROJECT REPORT:

***Biofuels, what are the issues for a trading
company ?***

Travail de diplôme réalisé en vue de l'obtention du diplôme HES

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Fait à Genève, le 3 octobre 2008

Jeremy GEHRING

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Executive summary

Biofuels are a way of diversifying our fonts of energy and reduce transportation environmental impact. In Europe, the emergence of this market is driven by policy. Biofuels can potentially bring solutions to energy market and give incentives to develop agriculture. But their development created a distortion on the markets and production sustainability is a serious issue. This makes the further development of biofuels uncertain and challenges trading companies willing to invest in this market.

In order to respond to the sustainability issue, criteria are being implemented to the supply chain and certification systems are being developed. In the short term only environmental criteria are implementable.

Through a qualitative ethnographic approach and an in-depth interview process, the research has peered into the stakeholder interests. It has been pointed out that an important part of the stakeholders was supporting the market. There is a lack of rational information concerning the potential of the industry and public opinion has build up a sceptical judgement. The study has pointed out that public opinion had an important role. Such beliefs will influence politicians. Therefore public opinion must be considered a key factor that makes the market uncertain and risky. For the moment this trend does not affect investors and market is growing. But in parallel to this the actors are asked to manage the sustainability issue, which represent a barrier to entry.

As soon as producers will be in measure to create sustainable products and as soon as agriculture will develop, public opinion will be in a position to support this market and let it grow. Sustainability is thus an issue that producers must control.

Traders willing to enter this market must therefore develop a management able to respond to this concern. The principal measure that must be taken is vertical integration. By controlling the production of the feedstock, trading companies can develop sustainable management of agricultural systems and integrate them to the supply chain.

Biofuels sustainability is above all an agricultural issue and all the stakeholders must join their forces in order to meet all the requirements and therefore make the society benefit from the potential of this technology.

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Introduction

Biofuels are presented as an alternative to the increasing demand of fuel and coming shortage of oil. It is also supposed to be a solution in terms of reduction of greenhouse gas emission. The EU and many other countries believe in this emerging technology and the European commission set through its legislation objectives to encourage the use of biofuels. This policy is the driver of this emerging market.

Recently society realised the global impact of biofuels. The commodities we use to produce biodiesel or ethanol reduce the global food stock and make price of food increase. The intensive culture required to supply the increasing demand of agricultural materials is also causing a lot of damage to the environment. This leads to the question: "Are biofuels a real sustainable solution for the energy market and transportation?" Many different lobbies are now applying pressure on The EU commission and the legislation will adapt.

The objective of this research is first to understand which factors will influence the future of this market in Europe and to foresee how the potential of first and further generations will develop in the coming years. The second purpose is to analyse what issues it represents for a trading company.

Through a qualitative ethnographic approach and in-depth interviews, this research compares the interests of the different actors and analyses what interests will influence the development of the market. In order to be sustainable, a market must take into account the issues of all the stakeholders. This research proposes a singular multi-stakeholder approach.

1. Context: Market overview

1.1 Biofuels policy framework:

In order to understand the context and the policy framework of the emerging biofuels industry, it is fair to highlight the directive of the European Parliament and of the council.

“The Community has long recognised the need to further promote renewable energy given that its exploitation contributes to climate change mitigation through the reduction of greenhouse gas emission, sustainable development, security of supply and the development of a knowledge based industry creating jobs, economic growth, competitiveness and regional and rural development.” (Commission of the European Communities: Directive of the European Parliament and of the Council on the promotion of the use of energy from renewable sources Brussels, 23.01.2008)

This proposal will meet the objective of reaching a 20% share of renewable energy in 2020 from which 10% will be realised through the use of biofuels in transport. In order this policy to be accepted; it was debated in the public consultation on the Energy Green Paper and the Strategic European Energy review. All the stakeholders of the market were consulted: Member states, citizens, civil society organisations, NGO's and consumer organisations. Out of this consultation, the commission could get a large support from the stakeholders for a stronger policy on renewable energies, including biofuels. The relevant arguments to promote the use of biofuels were the new economical growth perspectives, the reduction of GHG emission and security of energy supply. Negative effects related to pressure on biomass resources were also emphasized, as their exploitation may lead to shortages or unexpected environmental impacts. In order to control the external cost of the biofuels industry, the consultation proposed sustainability criteria that are currently being debated.

1.2 What solution can biofuels bring?

1.2.1 Energy market

The rising concern of biofuels is timely linked with the coming shortage of fossil fuel and increasing price of crude oil. Oil is not a renewable font of energy, and we must look for a sustainable alternative.

Biofuels are today's potentially most credible solution to reduce Europe's independence on oil. The EU is a net importer of oil and depends on oil producing countries, mostly Russia, Norway and Middle East. It is not an optimal situation in terms of security of supply. The first argument that is advanced to promote biofuels is the reduction of dependence on oil importations, using local biomass.

One of the most relevant advantages of biofuels is that it is the only ready-to-use technology that can bring an answer to the energy issue. Other technologies like hydrogen are not yet ready to be launched on the market at a large scale. Hydrogen requires huge investments of energy to be produced and is for now, economically not sustainable. For a long time, we are in control of the technology to produce fuel out of biomass. Biofuels are more accessible than any other technologies given that the industry can use the existing infrastructure, (e.g. fuelling station, tankers). Biofuels can also be used with any existing engine with no or little adaptation cost. Gasoline can be blended with ethanol up to 10 percent and fit in any gasoline-fuelled engines. Biodiesel can be used blended or pure in any diesel engine.

1.2.2 Reduction of greenhouse gas (GHG) emissions

Through the ratification of the Kyoto protocol, the EU assumes the policy of fighting against climate change by reducing GHG emissions. An important part of our emissions comes from transportation. There are three main mechanisms to reduce GHG emissions: improve energy efficiency, reduce energy consumption and diversify sources of energy into cleaner ones. The EU expects road transportation to increase, which will, with today's fuel technology, increase its GHG emissions. To meet the objective of GHG reduction the EU must diversify its fonts of energy and improve environmental energy efficiency. The European Community believes in this achievement and biofuels is one of the instruments that will give the EU the opportunity to diversify its font of energy into cleaner energies.

1.2.3 Agriculture market:

To compare biofuels with the oil industry the upstream phase is more intense in terms of labour. The upstream phase is cultivation. In order to be able to supply the industry with raw material, agriculture will have to develop. Further, this diversification into energy market will contribute to the multi-functionality of agriculture and give the rural economy new opportunities of growth in terms of investment income and employment. Referring to a European Commission Directive, 1% of biofuels in the EU total fuel consumption would create between 45.000 and 75.000 new jobs, most of them in rural areas. As the objective is to reach a 10%, the biofuels industry represents a great opportunity for agriculture and agribusiness. This opportunity mostly stands for emerging countries like Brazil, Argentina, Indonesia, Malaysia, as they possess a great potential of rural available land. In Europe it is a great argument of admission to the Union for countries with a high potential of agriculture, like for instance Ukraine.

1.3 What problem will biofuels create?

Now that biofuels are produced in an industrial way, and consumed at a relative large scale, Society starts to realise the externality of such a technology.

1.3.1 Competition with food and socio-economical impact

A problem that is argued is competition with food. The commodities used to produce biofuels are usually destined to providing the food industry. The more biofuels we produce the less commodities are available for food industry. As eating is the most fundamental need for humans, biofuels were heavily criticised. Their use is accused of increasing the price of food commodities. Jean Ziegler even considered the use of biofuels a “crime against humanity”. It is right that fuelling a car tank with corn or soybean poses an ethical problem. The correlation between the increasing price of food commodities and the increasing use of biofuels is not easy to interpret, as there are many other factors raising the price of food: the increasing demand of food in emerging countries, the increasing demand of feedstock for livestock, the increasing speculation on commodities, the reduction of food stocks, etc. It is rational to think that biofuels have a part of responsibility in the increase of price as it reduces the available stocks. But it is not easy to estimate how much they contribute. A good example that contradicts this is the rice market. Rice price also increased dramatically between 2007 and 2008 and it is not used in any biofuel. Even if we prove that there is not a significant relation between the increasing price of food commodities and the increased use of biofuels. Biofuels will suffer critics from NGO’s for ethical concerns and their impact on society.

1.3.2 Environmental impact

Many environmental lobbies use to call biofuels “agrofuels” as we cannot really label them with a “bio” title. In fact biofuels are clean out of the car. But we must not ignore the external cost in terms of environment. In order to meet the rising demand of feedstocks, world commodities output must increase and agriculture needs to be more efficient. To increase agro production we dispose of two levers. We can first intensify the crops on the available lands, and secondly make more lands available. Both of these techniques are causing damages to the environment. To intensify crops we use

more chemical products or GMO's. Ground suffers from chemicals and GMO's contaminate other crops. To make more land available, green areas are reduced. As most commodities come from tropical zones, the majority of those areas are rain forests and are considered the lung of the earth, contributing to the oxygen production. Rain forests are also the principal habitat of biodiversity. In Malaysia and Indonesia, Farmers argue that they deforest in order to plant palm trees and pretend not contributing to global warming. But even if the CO2 emission balance is neutral, they reduce dramatically the biodiversity.

1.4 Biofuels recap

World energy market tends to diversification, as its principal font of energy will get scarce and expensive. The EU also needs to diversify its font of energy in order to increase its energy independence. Biofuels are the short-term most available solution. The EU, through its policy, encourages the development of this industry and drives the market. However, stakeholders expect the actors to control the impact of the increasing use of biomass. They want this technology to develop, economically, environmentally and socially in a sustainable way.

2. Problematic: "What are the issues for a trading company?"

Many actors perform on the market along the supply chain: biomass producers, biomass processors, transporters, distributors. Between all these steps actors are connected via traders, that basically meets supply and demand. Biofuels market exists and is developing. Biomass is being produced, processed and biofuels are being transported and distributed; which means that there is an opportunity for a trading company to intervene.

This emerging market is facing many issues, which make its growth uncertain and complex to understand. It is necessary for a trading company to develop an analysis of the following questions, in order to be able to take the right decisions in the future in terms of strategy:

- Estimating the potential of the market opportunity
- Identifying and analysing the key developing factors and risks and controlling them
- Defining the key resources to command and fundamental skills to develop

This industry is for now not clearly regulated. As explained, producing biofuels out of biomass is extremely expensive regarding the external costs. The importance of controlling the impact makes the stakeholders expect a strong regulation on biomass production. Sustainability issue will be a key factor of the potential and a trading company willing to invest in this market must understand and control the concept of biofuels sustainability. In order to be sustainable a market must be efficient from an economical, environmental and social point of view. From another approach, a sustainable and lasting market is a market in which the interests of all the stakeholders are taken into account. A trading company must integrate the expectations of the stakeholders, as they drive the market. This concern will lead the research process.

3. Literature review

Before carrying out the research it is necessary to draw up the literature review in order to understand the actual course of the market. Criteria definition and implementation is the first step to define and control the impact of biofuels. Criteria must respond to the expectation of the public consultation and all the stakeholders interests must be taken into account. But they must not represent heavy barriers to trade as they could bring to a dispute with WTO.

According to the “Sustainability criteria and certification systems for biomass production final report” of the Biomass Technology Group (BTG) 2008, hereunder is a summary of the sustainable criteria proposed by stakeholders, confronted to the WTO rules. At this step, the scope is to estimate the level of trade barrier that would represent the sustainable principles and show which are in the short term acceptable. The need of controlling impact is urgent and only main factors can be retained in the short term.

-GHG savings

“The GHG balance of the biomass production and application must be positive. Biomass production must not lead to important carbon sinking in the vegetation and in the soil.”

- Implementation workable regarding WTO rules as human, animal and plant life protection is a global environmental problem and biofuels impact directly on GHG emission.

-Avoiding competition with food

“The production of biomass for energy must not endanger the food supply and local application.”

- Implementation not workable regarding WTO rules, as it is difficult to define the impact of biofuels on food market.

-Protection of biodiversity

“Biomass production must not affect protected or vulnerable biodiversity and will where possible have to strengthen biodiversity.”

- Implementation workable regarding WTO rules, as protection of biodiversity is a measure to protection of human, animal and plant life.

-Protection of local environment

“In the production and processing of biomass the soil and soil quality must be retained or even improved”

“In the production and processing of biomass ground and surface water must not be depleted and the water quality must be maintained or improved”

“In the production and processing of biomass the air quality must be maintained or improved”

- Implementation difficultly workable regarding WTO rules. Local environment is an issue that WTO considers. But such criteria will certainly be rejected by the concerned developing countries.

-Promoting positive local economic effects

“The production of biomass must contribute towards local prosperity”

- Implementation not workable regarding WTO rules. It is retained that this criteria is not quantifiable. Even concerned third countries, would reject this principle as “positive effect” would create differences between social circumstances and this could be retained for trade limitations.

-Avoiding unacceptable labour and indigenous people rights violations

“The production of biomass must contribute towards the social well-being of the employees and the local population”

- Implementation difficultly workable regarding WTO rules. The BTG distinguishes between the negative effect on human rights and other social issues. It is retained that avoiding negative effects on human rights is acceptable. Other social issues are considered to be far reaching the biomass discussion and need to be analysed separately.

A first conclusion can be made out this short analysis: all the criteria are not acceptable in the short term, as they will represent heavy barriers to trade and may not be accepted by the WTO. The criteria that may be retained in the coming legislation are the ones concerning the environment. It does not mean that social criteria will never be implemented in the future. For now, the EU needs to find a quick solution in order to start regulating the production of biomass. Social criteria are in the short term not workable and bring to a dispute with WTO. They are not quantifiable and the impact of biomass production on society is not easy to interpret. Anyway they can be implemented as “voluntary criteria”, if there is demand for socially clean produced biomass.

What must be retained from this first analysis is that producers must be able to control their environmental impact in the short term in order to anticipate the coming legislation. This will be developed further.

4. Development:

4.1 Research objective

As described, the objective of this research is to make an opinion about the potential development of biofuels, which will be useful for any company willing to invest on the long term in this market. Referring to the biofuels lifecycle we can consider that it is at the growing stage. The uncertainty of the introduction phase is behind as we consider biofuels to be a potential technology to reduce our dependence on oil. It is now fundamental to estimate at which stage the market will reach a maturity phase. In other words, what can we expect from biofuels in terms of alternative to fossil fuel and investment opportunity.

In today's context biofuels industry cannot develop on its own. Because of the stakeholder's pressure, other considerations must be taken into account. The implementation of sustainable criteria was analysed here over. It is now necessary to understand why such criteria are pertinent and how stakeholders are applying pressure on the market decision makers.

The output of this study will enable a company investing in biofuels to understand the actual situation of the market, to be aware about the role of the key factors that will lead the market development and to have an idea of the possible direction the market will take.

4.2 Methodology

This section is willing to explain the method used in this research, in order to field the problematic. As the biofuels industry is emerging, most of the available articles come from specialised press or newspapers and were just used for a first approach and introduction of the context. To make this research unique, the author chose to collect its own information out of the fieldwork. Therefore, it is necessary to develop and use a qualitative research method which will be based on the analysis of in-depth interviews. The scope is to collect information from different stakeholders of the industry and to measure the relevance of their stakes in order to comprehend which interests will be considered and retained in the future framework.

The first step is to define the use of the stakeholder concept. A stakeholder is a party that has a certain interest in a company or organisation. In this research I consider the biofuels industry an organisation having an impact on several involved parties. It is therefore relevant to identify these parties and their interests.

The notion of interest must be differentiated between direct interests and indirect interests. What I understand with the direct notion of interest, is what the party expects from the industry in terms of performance or revenue. They expect from the industry positive fallouts on their well-being. On the other hand there are parties that do not want to suffer the negative fallouts of the industry they expect the industry to respect their interests. I consider these parties to have indirect interests.

Let's now segment all the stakeholders and point out their objectives and own interests regarding the biofuels industry.

Stakeholder	Objectives and interests regarding biofuels
European environment	Reduction of GHG emissions
Producing countries environment	Biodiversity protection Avoiding soil, air and water contamination
Global environment	Positive GHG balance
Local societies	Job opportunities Agriculture development Respect of labour condition and child labour Life condition due to environment deterioration
Global society	Control the impact of the increasing price of food
NGO's	Make actors aware about the issues Influence public opinion
Developed governments (EU)	Security of energy supply Reduction of dependence on imported oil Meeting the Kyoto protocol objectives Meeting public opinion
Developing governments	New industry opportunity
Producers, traders and scientists	Business opportunity Investment security and profit Agriculture technology researches incentive
Oil companies	Diversifying their font of fuel Meeting legislation Not to lag behind
Final consumers	Fuelling their car tank at a reasonable price Communicate about sustainability

Figure 1: stakeholder segmentation - GEHRING Jeremy 2008

4.3 Research strategy

The information that will be collected out of these interviews is the core of this research. The analysis will essentially be based on. This section is willing to explain the strategy developed in order to obtain relevant and singular information. To understand the stakeholder behaviours regarding their interests on this market an ethnographic approach has been retained. This approach will permit to answer the qualitative questions: “Why do the stakeholders have an interest in this market?” and “How the stakeholder is pushing its interests forward?” In the Figure 2, stands a table differentiating the ethnographic approach from the scientific approach, revealing thus the appropriateness of this choice. Compared to the scientific approach, the ethnographic approach does not take into account an exhaustive sample among a population. The interest of the in-depth interview process is to concentrate on a representative sample in order to collect opinions and positions. The scope is to draw up an hypothesis, analysing the interests of the stakeholders through their personal feelings about the concern. It is relevant to analyse what stakeholders feel about a market as these same persons perform on it. Their state of mind influences their behaviour and the development of the market.

Characteristic	Scientific approach	Ethnographic approach
Questions that can be answered	What, how much	Why, how
Associated methods	Survey, experiment, database	Direct observation, interviews, participation observation
Data type	Predominantly numbers	Predominantly words
Findings	Measures	Meaning

Figure 2 Characteristics of two research approaches (Mayor and Blackmon 2005, p. 140)

4.4 Data collection and data analysis per stakeholder

For confidentiality reasons, the following used names are fictive.

4.4.1 Environment:

Liliane Turney, Gland – Switzerland, NGO

What is your role in the biofuels development?

Our role is to provide main actors with facts, knowledge, studies in order for them to understand the issues related to environment. We do not lobby as we do not take part in the discussion in the EU. We intervene as experts in environment consulting.

Who are the main lobbyists for environment?

The main actors are WWF, Friends of the earth and Greenpeace. As these NGOs are mostly financed by individuals, they need to be active and be seen by their contributors. As our financing mostly comes from member-state, we do not have to be known and we can thus concentrate our efforts on the expertise.

What do you concentrate your effort on?

We put a lot of effort into convincing developing countries about the importance of environment in their ecosystems. It is ambiguous as for most of these countries agriculture represents their most important potential of growth. We created several High Conservation Value Areas. This step is clearly a constraint for developing countries. It is very difficult to implement such an ecosystem conservation process because of corruption. Developing countries do not ignore environment, but they have other more important issues.

Some criteria are more workable than others why?

In environment, it is difficult to define what to measure and therefore what to report on. Criteria concerning water or soil contamination are easy to measure and implement. But others like biodiversity, land use change, GHG balance, climate change are difficult to work on. Many studies are done and it is very subjective as you can approach these questions at different scales (local, regional, global) and different points of view. Therefore the cause and effect can be different according to a study or another. When we talk about biofuels environmental externalities, we talk about agriculture externalities that exist since ages. There is nothing new. Biofuels were introduced as a

sustainable alternative fuel. Feedstock production remains to be solved and it is not a biofuel problem it is an agriculture one. The increasing demand of feedstock for biofuels increases the deforestation and all the problems related. But to give an example: within global palm oil output, only 5% are used to produce biofuels. Implementing criteria for palm oil use in the biofuels industry is ineffective as the 95% will remain uncertified. Biofuels and food industry must collaborate as they drive the demand of feedstock.

GHG balance remains the most important criteria?

They are all important, but GHG is a criterion EU insists on. Biofuels is linked with the EU objective to reduce GHG emission, which is linked with the ratification of Kyoto Protocol. Other criteria come from the pressure of other actors. I do not think that setting a certain percentage of biofuels is effective regarding the environment sustainability. The objective of setting up to 10% of biofuels is clearly to develop a new industry. To reduce GHG emission, the EU should better have set objectives in terms GHG reduction and let the market find the way of reaching them.

How can a company investing in biofuels control its impact on the environment?

There are many ways for a company to control its impact and they have existed for a long time. Even if there has been a lack of investment in agriculture these last 20 years, culture intensification is not a new issue and farming industries know how to control part of their impact. The fact is that there is no incentive for them to put into practice cleaner culture.

What is your opinion on biofuels future?

Today's biofuels generations are not efficient enough and will not last ages. Anyway at a local scale, using local surplus has a potential. Third generation, based on algae has a much better yield and does not interfere with agriculture.

→ Main environmental problems are related to production of the feedstock and depend on the agriculture process. To control biofuels environmental impact, we must integrate sustainable management of agricultural system on the upstream phase of the supply chain.

4.4.2 Society:

Mahmoud Diakite, Conakry – Guinea, computer technician

What do people say in Guinea about biofuels?

Most of the people do not know about biofuels. Information does not circulate and illiteracy makes people ignorant. The persons I can talk with are not convinced about biofuels potential. There is here a South African company investing in corn plantations for ethanol production. This could be positive in terms of job opportunities but working conditions are tough and employees are not union members. Agriculture is being developed, but local people do not directly benefit from this, as the output is exported.

Have food prices increased in Guinea?

Yes, dramatically. A kilo of bread increased from 250 up to 2500 Guinean Franc. People do not understand why. The only economical factor they complain about is oil price.

Mariana and Fernando Carmassi, Bragado - Argentine Pampa, horse trainers

Since the rising of biofuels concern what has changed in your region?

The region we live in is the principal soy grower of Argentina. Since 20 years the agriculture has developed tremendously. Soy is easy to grow and the ground around Bragado is very fertile. Now that soy is used in biodiesel, the culture is getting more intensive and we start to feel its effects.

How has your life been affected?

Local environment has been mostly affected which had an impact on our life. Roundup and insecticides have disrupted the biodiversity. Butterflies and toads are disappearing; ants have developed and do not suffer from insecticides; dead fishes float on the ponds. We are afraid of the water quality and do not let our horses watering in the brooks. In the well, which provides the village with water, we need to draw from 30 meters instead of 5 meters to get clean water. When fields are treated with insecticides, our eyes sting for several days. Our professional activity has also been affected. It is very difficult to grow the grass on the polo ground and there is no more available land to winter the horses. But we are mostly afraid for our two daughters; the

environmental situation is not reassuring. We would feel much more secure in an uncontaminated country.

What do people say in your region about biofuels?

Most of the people do not talk about biofuels. A lot of them do not even know that the soy produced in the region will be transformed into biofuels. People only talk about their own interests and are not informed enough. They do not look for the reasons of the changes. If there is something to complain about, it is the government. There is a lack of education in terms of ecology. In general people do not realise their impact on the environment. They can cut down a 200 years old eucalyptus to grow 400 square meters of soy. They do not care about environmental issues, they have others problems. Growing soy in order to survive and bring up their kids.

Do you consider biofuels to be positive in terms of Job opportunities and agricultural growth?

Unemployment has decreased in the region and most of the jobs created are related to agriculture. Anyway, working conditions are insecure and salaries are not adapted to the high inflation rate.

How about food price?

Since 3 years food has increased a lot, mostly meat which is our basic food. The "Asado" kilo has increased from 7 to 17 peso. Because of the intensification, land to grow cattle is getting scarce and meat production has decreased. Other products like tomato and dairy products also increased dramatically. Some people boycott these products. They complain about the government incompetence more than on competition between energy and food markets.

Do you feel that biofuels producers are attentive to your interests?

It is ambiguous as they provide the community with jobs and on the other hand they deteriorate our environment. But in any case, there is no way of bringing them to justice as all the lawyers of the region are involved in agriculture.

Pablo Blanc, Buenos Aires – Argentina, agricultural engineer

Do you consider biofuels to be positive for your country?

Yes, it brought many growth opportunities, and it represents a new way to giving value to our agricultural output. Biofuels increased the demand of soy which is our principal output. In Argentina, when agriculture goes, economy goes.

How about job opportunities?

Biofuels production does not require an important workforce. Jobs have been created, but it is not a major factor of positive fallout.

What do people say in Buenos Aires about biofuels?

The public opinion in Buenos Aires is rather pessimistic regarding biofuels. They think that it will intensify soy crops and have a negative opinion about soy cultivation. But in Argentina agriculture uses cutting edge technology processes. Their opinion is distorted. Most of the farmers are aware that they must take care of the ground they cultivate and do not carry out monocultures as we think. There are many ways of cultivating in a sustainable way and these methods are implemented.

How about food crisis?

In Argentina some people suffer from it. But I do not think that there is a connection between biofuels and the food crisis. I think importing countries suffer much more than us. As grain exporter, our government keeps watch over grain prices and intervene to control any increase in the internal market.

Denis Brisebois, Belo Horizonte – Brazil, favela priest

What do people in the favelas know about biofuels?

They do not directly know about biofuels concern, as most of them do not have a car. In Brazil, ethanol exists since a long time. It has another position that in Europe. We consider it a cheap substitute to fossil fuel. Only upper classes can afford price of gasoline. It is a mark of social accomplishment. In Brazil all what comes from overseas is considered better. That is why our ethanol is depreciated by people, even if it is positive for the country in terms of energetic independence. In the favelas, people do not care about the issues related to biofuels or ethanol industry, they usually do not

understand the causes and effects of a system. Some people do not have the mental capacity, but it is mostly a lack of will to understand how things work.

Among the favelas, have biofuels industry brought job opportunities?

Most of the people in the favelas work in the city. Sugar cane crops are far away from the cities. Some people do not have the choice and leave their families for several months to work in the crops. Most of the time, they do not come back and stay working in tough conditions. This splits many families up. From an economical point of view, ethanol created a lot of jobs. But the most in difficulty people do not enjoy it.

Are there many children working in the plantations?

It is hard to say. President Lula has a strict position about child labour and sanctions are very heavy. But Fazendas are so vast and are very isolated. It is very difficult to control working conditions. Moreover corruption is present and Police do not always carry out its core mission. We often here about the toughness of working conditions some people even consider it slavery.

How about food crisis?

Food price has significantly increased and food is an important part of the family expense. However there are no people starving in the favelas, there is enough mutual aid between them and the government also provides them with basic ingredients. But people are tired of being dependant they suffer at a psychological level from this situation. The sugar cane use is not a real problem for our food market as it is not part of our basic food. Meat, rice or other cereals have increased but they are not related to our ethanol industry.

Solène Chappuis, Lausanne Switzerland, NGO spokesperson for biofuels

What is your opinion about the emergence of biofuels industry and how about developing countries?

It is more an opportunity for agribusiness than for developing countries. It is true that local agriculture is being developed, but does not only have positive consequences. In Western Africa, investing companies take advantage of the weak land law and appropriate lands to grow biofuels feedstock. It gives job opportunities, but local societies do not benefit entirely from this opportunity. We also notice difficult working

conditions. I do not trust in the certification system for now. There is still a lot of effort required to provide the biofuels industry with a clean production of feedstock.

Developing countries provide EU biofuels markets with feedstock; can we imagine them developing their own biofuels industry?

Yes, most of them have the resources and it would be very interesting for non-oil-producing countries. But developing countries are trusteeship. Their investment strategies are developed by the World Bank and International Monetary Fund that support developed country industries of which biofuels industry.

What is your role as an NGO?

We provide local societies with expertise and information. We also facilitate talks between local societies and governments. We do not have a direct and concrete power to support stakeholder interests at the hands of authorities. Our role is to make people aware about the biofuels issue and drive public opinion. We can influence both, developing and developed countries public opinions. We are not considered as actors in this market, but our involvement has an impact on politics.

How about the food crisis?

There is a real structural problem. Subsidies distort the food market and it makes developing countries dependant to our exportation. They did not therefore develop enough food producing crops. With the increasing price of international food, developing countries will get back to their local production. Biofuels had relative impact on the food market. It is not the main factor of the food crisis, but it is so absurd that we can consider it the icing on the cake.

→ The social issue is ambiguous. Biofuels could be positive for developing countries people, but social criteria must be implemented. It is an opportunity of growth for producing countries as it develops their agriculture. Biofuels reputation suffers because of the food crisis. It is not among the main factors, but public opinion considers the biofuels an aberration. NGO's are the spokespersons of society but they do not have a direct power. Their role is to influence public opinion about sustainability issues. In general biofuels concern is misunderstood by society.

4.4.3 Governments:

Alain Vaucher, Nyon – Switzerland, former member of the council of state and president of Western Swiss federation for energy

What leads politics to support biofuels in Europe?

Energy is an important issue for politicians. Biofuels is a way to diversify our fonts of energy and also a way to decrease our dependence on imported oil. These are the fundamental reasons why politics support this industry. Other economical factors also drive the biofuels policy like preserving automotive industry and developing agriculture.

What is relevant today?

Politicians must take into account the interest of all the parties, but the main factor that drives the political decisions is the public opinion. It is the weakness of today's democracy. Public opinion is driven by Media that use to amplify real facts. In biofuels Media insist on the negative impact of the first generation, I do not think that the public could understand the real reasons of this industry development.

How can public opinion impact on biofuels?

Political decisions must reflect public opinion. I am rather pessimistic regarding the future of biofuels as they suffer a bad reputation from public and policies could no longer support the development of biofuels. I think that some European countries will reduce their objectives or strengthen their policy on the feedstock use in biofuels production.

What is your opinion about the food versus energy debate?

Biofuels have a significant impact on some commodities, like corn which is used in the USA at 25% in ethanol. Biofuels have a part of responsibility but the food crisis is a structural problem. Countries that suffer food crisis did not develop their agriculture in order to be food independent. A lot of developing countries concentrate their production on high commercial value commodities like cocoa or coffee rather than on food producing crops, though most of these countries are vulnerable to price increases. Anyway the rising price gives the incentive to more investment in agriculture and situation should improve.

What future for biofuels?

Biofuels are valuable in the short term. They will relax our fossil fuel consumption and we will be in measure to consume more petrol for the material industry. But they will especially allow a transition to other technologies and new fleet of car. I am confident that before 2020 there will be a drastic change in energy for transportation mostly electric cars and hydrogen. I do not think biofuels will reach the EU objectives. They will last but not grow significantly, as we will switch to other technologies.

As a politician how do you consider the reduction of consumption lever?

Reduction of consumption is essential. But as politicians we have to support our industries and pursue a policy of free market economy based on economical growth. We cannot impose consumption restrictions. People must have the possibility to make choices. We must involve people and encourage them in order to consume fuel in a more efficient way.

→ Politics support the biofuels industry. In Europe they are the market driver through legislation and mandatory. Politics reflect public opinion, which is a key factor of biofuels development. Politicians must support any economical growth strategy and biofuels are a growth factor for agriculture.

4.4.4 Producers, traders and scientists:

Louis Bonneville, Switzerland, biodiesel Producer

Can you present your company?

Eco energy was funded in 1994 and employs 2 people. We are the Swiss biodiesel production leader with 3mio litres, representing 30% of the Swiss biodiesel consumption and 0.15% of the diesel consumption.

Can you explain your production process?

We control two steps of the supply chain the crushing and esterification phases. We receive the rapeseed in bulk and process it. Out of this process, we obtain biodiesel and rapeseed meal. The process is, compared to oil refinery, very simple. The investment represents 4 millions of francs.

What gave you the incentive to invest in biodiesel?

In the 90's there was an agricultural surplus in Switzerland. We therefore found another way to use our product. We funded this enterprise with about 1000 local farmers. We set agreements with them in order to hedge our supply of feedstock. Using the surplus we increase the demand and therefore price went back up. It was also a way to control prices.

Who are your main clients?

At the beginning they were the local farmers. Since 6 years we diversified our distribution to public services and transport companies that do their own blending. These companies bet on a green communication and low price energy. It is also cheaper to use biodiesel and some clients profit the climate cent incentive.

How do you feel the demand in Switzerland?

The "scandal effect" is now weakening. We feel the demand present and we could sell more biodiesel. It is just a question of price. In general Biodiesel is 15 cents cheaper than fossil diesel. If we still control the feedstock price and crude oil remains at a high level. Local demand will even increase, we feel confident.

Do you only use local feedstock?

Most of our input comes from Switzerland sometimes we import some from France, but nowhere else. We only use rapeseed. About 6% of the rapeseed production is used in

biodiesel. In Switzerland the legislation is strict and we cannot import Palm oil or Soy oil to produce biodiesel. I received offers for jatropha seeds from Africa, but I find inefficient to import raw material from far away. They rather should do their own jatropha biodiesel in Africa. Biodiesel is efficient at a local scale. Switch to another feedstock would not require any heavy investment; we would just have to adapt the process. But for now, we do not plan to use any other feedstock than rapeseed. We are convinced that it is the most efficient way of producing biodiesel in Switzerland within the actual framework.

How about legislation in Switzerland?

In Switzerland we do not have directives with objectives to reach like in the EU. There is no legislation driving the market. For now the Swiss production is limited at 20 millions of litres and it is not even reached. Importation is heavily taxed. That is why Biodiesel does not represent a big market compared to the EU.

How about traceability?

We can obtain all the certificates we need from the farmers. But once that several lots are mixed together; it is no longer possible to regain the traceability. If we discover afterwards, that among the lots one sample was not meeting the requirement, like for instance GMO's, the whole production is not acceptable.

What is your opinion about biofuels future?

In Switzerland we dispose of a strong regulation that makes our biodiesel sustainable and we do not interfere with international markets and related problems. Anyway the rapeseed production is limited in Switzerland to avoid monoculture and to support food producing crops, only part of the rapeseed can be used into biodiesel. But even with this restriction the potential is not fully used there are many hectares of rapeseed that can be used in biodiesel production. The Swiss market can grow even within the actual framework.

Pascal Vermillon, Geneva – Switzerland, biofuels trader

How do you consider the potential of biofuels compared to oil?

Biofuels will not substitute fossil fuels. Anyway biofuels will reach a small but relevant share within the fuel market. Thanks to this technology oil peak is delayed. Biofuels represent a short term solution. It is necessary to develop this industry to create a

market which is now driven by the EU directive. Today's biofuels generation is questionable in terms of efficiency. But energy market needs to go through this first step in order to be able to build other biofuels generations.

What interests do oil companies have in biofuels?

First it is not their core business and biofuels are more linked with agriculture market. The fundamentals are different. For most of the oil companies biofuels are a constraint as they have to provide fuel pumps with blended fuels and they do not control the fundamentals of agribusiness. Anyway some oil companies turn this constraint into opportunities. They bet on a green communication strategy like BP.

Investing in biofuels represent an important investment?

It is fair to understand about the supply chain steps and then talk about investment strategy as you can invest at many different steps. To illustrate with biodiesel production, we can retain four main steps: feedstock growing, where the plant is grown and harvested; crushing, where the plant is transformed into oil; esterification, where oil is mixed with alcohol; and blending, where are mixed different types of biodiesel to meet fuel specifications. As the technology is very simple, the investment is not that important in terms of money and the payback goes quick. The most important is not only to own a biodiesel plant but to have control of the input. This means owning the feedstock production and processing phase, or at least building strong relations and agreements with growers and crushers. Usually biodiesel plants are located near the fields in order to have control of the feedstock.

How about sustainable criteria implementation?

Nowadays oil majors do not buy any biodiesel if they do not meet specific sustainable criteria. Oil majors run a reputation risk. So we do not trade biofuels that do not meet required sustainable specification. The easiest way to control the implementation is to integrate the upstream phase of the production. It permits to control the risk related to the certification and to hedge on the price of the feedstock.

William Jackson, Lausanne – Switzerland, Director of an energetic laboratory

Do you consider the EU directories achievable?

They are achievable. I think we can find the resources even within the first generation. There are several issues related to the development of this industry. But from a

scientific point of view this objective is valid and will bring solutions to energy market and environment. It will depend on the way we produce biofuels, but I feel confident that we will find producers meeting the expectations of the market. The effort is put into controlling the sustainable criteria. On the long term, the objective is not extensible. We estimate the maturity level at 10%-15%. More would create significant negative fallouts.

Is it valuable to trade biofuels at a global level?

Yes, but in general the feedstock must be processed into biofuels in the growing country. It is worth to export Brazilian ethanol even environmentally. The market is very sensitive to the sustainability issue and will have to be transparent. I do not imagine the biofuels trading similar to commodities trading. In order to guarantee traceability, the supply chain would have to be short and the market will organise via bilateral transactions. Traders must integrate criteria and therefore control all the steps of the supply chain. Blending will be very difficult for traders, because of the lost of transparency. The international market will require specific logistics, which is costly, but products certifiable will profit from fiscal advantage. For now legislation is not strict but we expect a much stronger policy in terms of criteria integration.

Reputation of biofuels is not very good will it improve?

These last two years biofuels had an important impact on markets and public opinion. But it is a first reaction as we created an imbalance. We are in a transition period Agriculture will adapt to the emergence of this new demand. This situation makes agriculture attractive and drives investments.

What is the scientific issue?

From a scientific point of view, it is worth to develop this industry. Thanks to biofuels a lot of researches are carried out and agriculture is being revitalized. The interest is to find a way of producing biomass out of poor lands. We put a lot of efforts in Jatropha. For now, we have very little experience to estimate its potential.

How about other technologies for transportation?

We must prepare for a multi-option solution. First improve engine performance, and in a second time, bet on electricity and hydrogen. I think these coming technologies will be efficient in 2050. Fuel is still going to have an important place in energy market.

→ It is an opportunity for producers, traders and scientists and they are confident about the development. Their investments and research create a market and develop agriculture. Biofuels trade is worth at a local and global scale, but criteria implementation is a key factor that traders must control. To control this, they must integrate vertically. The market must be transparent to benefit from tax incentive and respond to public opinion demand.

4.4.5 Oil companies

Markus Walder, Zurich – Switzerland, Director of a Swiss oil company

Biofuels represent an opportunity or a constraint for an oil company?

It can be an opportunity but the rules need to be the same for all competitors. In Switzerland we do not have mandatory like in the EU. In Switzerland the incentive is only economic. As we only play in the downstream phase, it is a way of diversifying our font of energy. But it remains a niche. In the EU it is more a constraint as oil companies must incorporate a share of biofuels according to legislation.

What is the potential of biofuels for your business?

It is very limited. Biofuel supply is not guaranteed. As distributors we do not control the production, and cannot hedge the supply. We provide the Swiss market with some biodiesel, but the blending pumps are an expensive investment for a very small volume. Our biodiesel clients are mostly public transport companies willing to communicate on environmental issue, we do not sort out any energy sustainability problem. Anyway, according to market price, it can be economically interesting for them.

How can you control sustainability criteria?

To obtain a certified biofuels it is necessary to segregate it through the whole supply chain, which means than it must never be mixed, or processed with other any feedstock or biofuels. This would require a specific logistic and it is economically not affordable. I do not think anybody would afford such a cost. We import our Biodiesel mostly from Europe. As importers, we know about the origin of the product, but not about the origin of the feedstock. It depends on the market availability and we cannot control this.

What is your position about the food versus energy debate?

I do not think that biofuels had a significant impact on food prices. The only significant impact was on corn in the US as quantities used are much more important than in other commodities. I feel more like other factors related to our way of consuming drive food prices up.

How do you anticipate peak oil?

Personally, I do not believe in peak oil. It is a measure of price. As long as oil price remains on this increasing trend, oil production will adapt. It gives incentives to more extraction. Oil resources are limited but biomass is also limited as we need it to feed the world. I do not consider biomass a sustainable font of energy either. Oil consumption for transport is not going to decrease these next 20 years. Anyway in heating there will be a significant change. There are more alternative and only 3% of the new buildings are built with an oil heating system.

How about the fleet of car?

Most of the cars will still run with fossil fuel. Alternative font of energy will play a big role. First the fonts of energy will diverge and many technologies will compete. On the long term, the technologies will converge into the most efficient and homogenous one. That is what makes fossil fuel so efficient now; you can drive from Zurich to Beijing and find the same product all along the way. The next technology will have to be homogenous and so will remain the fleet of cars.

→ Oil companies do not really consider biofuels a market opportunity. In EU legislation imposes them to blend biofuels with fossil fuel. In Switzerland it depends on the demand, but it is limited. It does not represent an important market compared to their core business. But they must control this market in order not to lag behind. Oil companies are confident that oil will be the most important font of fuel and energy for transportation for the next 20 years.

4.4.6 Car manufacturers

Nicolas Pasquier, Morges – Switzerland, car retailer

What issue do biofuels represent for automotive industry?

Car manufacturers do not talk about biofuels. I do not think they believe in this technology, at least in Europe. They do not plan to adapt significantly their motors to more specific needs for biofuels. They concentrate their RD efforts in the energy use efficiency. The trend is about downsizing the motors and reducing the fuel consumption.

How about consumers?

They do not either talk about biofuels, when they buy a new car. The main criteria remain price, fuel consumption, security and comfort. They do not care about the kind of fuel the car consumes. What drives their choice is only the financial aspect, environmental one is only considered if it is economically affordable. We cannot make people consume in a clean way without any financial incentive. Fundamentalist exist but they are few. Buying a new car is an important investment for a family. We anyway encourage them to take eco-drive classes in order to consume fuel in an efficient way.

How do you imagine the fleet of car in the coming years?

I think the next step is electricity car. All the car manufacturers propose at least a prototype of 100% electric or hybrid car. But for now there is only one company producing at a relative large scale an electric car, that respond to all the criteria: Economically affordable (30.000 Euros), secure and comfortable. But the independence is compared to classic car very short. For the next ten years the trend will still be the downsizing of fossil fuel motors. After what electric and hydrogen will play a bigger role.

→ Car manufacturers do not believe biofuels and do not put particular effort in adapting their cars. The fleet of car is one of the key factors that will define the further need of fuel. The short term trend is to concentrate on the fuel consumption efficiency and the long term trend is to diversify into non using fuel cars.

4.4.7 Final consumers

Serge Rusconi, Geneva – Switzerland, Director of a recycling and transport company

What is your annual biofuels consumption?

We only consume diesel. Our annual consumption is 470.000 litres of which 64% (300.000 litres) are biodiesel. It represents 780 tons of CO2 savings. All our vehicles and machines run with biodiesel and we were the first company of the region to invest in a blending installation.

How did you decide to use biodiesel?

We are a forward-thinking company and consider the environment our principal asset. We therefore put a lot of effort in controlling our environmental impact. When we first invest in biofuels, it was economically not interesting. But our financial situation was able to afford such a decision. So at the beginning, it was only an environmental decision. Then we built a communication strategy based on biodiesel. Now biodiesel is even cheaper and we also enjoy the “climate cent”.

Where do you buy your biodiesel from?

The biodiesel we consume is produced in Switzerland with Swiss feedstock. It remains a local industry. It is produced out of Swiss rapeseed and do not influence global food market.

How about using other biodiesel?

For now we do not think about changing our biodiesel consumption. We have an agreement with the producer to hedge our supply. We would anyway study any other opportunity, but it must remain a Swiss or regional origin and must not interfere directly with food crisis. I would analyse the whole supply chain and external cost of any other Biodiesel, but remain pessimistic about alternative for now. Swiss rapeseed biodiesel is the most efficient.

Beyond using biofuels, do you also look for reducing the fuel consumption?

Yes, our drivers have taken eco drive classes in order to increasing the efficiency of our consumption.

How about other transport companies?

Lots of them also use biofuels, mostly public transport companies or Police. But they consume it at a ridiculous scale. It is just to boast of their environmental involvement. They do not even reach 5%, it is just about communication. They do have a significant impact on environment.

Do you have an exit strategy?

Yes, our blending pump is already amortised. We can switch immediately to full fossil diesel consumption.

What impact had the "biofuels scandal" on your strategy?

Unfortunately, we had to withdraw our slogan on our vehicles. It is a shame, because people do not make the difference between the global biofuels industry and the local biodiesel industry. But it did not have any impact on our consumption. We are confident that the technology we use is sustainable. For us it is not a question of image, it is question of personal convictions.

→ Fanatic environmentalist consumers exist. But they are few and do not consume whatever biofuels. The majority of the consumers use biofuels as a green communication tool. Since the negative public opinion, communication based on biofuels consumption is not effective. Consumers do not depend on biofuels they can switch immediately to fossil fuel.

5. Directorial recommendations:

5.1 Market potential: Biofuels still represent an opportunity?

After having studied the position of several stakeholders, in other words, people that perform on the market through different processes: investing, producing, objecting, buying, etc... This section is in measure to propose a singular and qualitative position on the potential of the biofuels market and the opportunity it represents for a trading company.

Biofuels can represent an opportunity for most of the stakeholders. It is therefore worth to develop this industry as many people around the world will benefit from it. Investments are being made, jobs are being created and demand is driven by legislation and lower prices than fossil fuels. This market exists. Most of the interviewed people feel confident with the future of the market. An exit strategy willing to backtrack the market would be difficult implementable as the market results to be an opportunity for most of the stakeholders. An exit strategy would also be extremely costly. The scandal created by the emergence of biofuels is weakening and socio-economical situation will adapt. Efforts are now put into controlling the impact, by setting sustainable criteria and certification systems. This shows that actors consider the challenge to be reachable.

Considering the actual fleet of cars, biofuels technology is an opportunity as it fulfils the need of an increasing market better than any other font of energy for transportation. On the long term, others technologies are expected to emerge and will interfere with biofuels. But as far as the EU legislation drives the demand through its directives, the threat is limited and the EU market will develop until 10%.

In order to assess biofuels potential it is necessary to study its lifecycle and segment them into the two generations (third generation is not taken into account). Lifecycle study is usually used a posteriori. But at this step, it gives an idea to draw a hypothesis and to understand which factor will make the market reach maturity and decline.

First generation is the very first step to launch the market and to assure the energy transition. Further, the opportunity lies in the use of more diversified feedstock. First generation has the potential to grow and reach a significant part of the 10% EU

objective. But first generation is a transition to second and further generations. As soon as non-food competitive material will be used at an industrial scale, first generation will reach maturity. In general, Biofuels will last until non-fuel technologies will be implemented with the fleet of car.

Against oil, biofuels potential is very limited. The EU objective will be hardly reached and transportation will still depend up to 90% on fossil fuel. Biofuels is an opportunity for agriculture and people involved in agribusiness will profit from this potential.

5.2 Evaluation of key developing factors and risk

In order to apprehend the future of the market and to control part of the factors that make it uncertain. It is fair to develop an analysis of the role of the key factors that will influence its development. Or in other word the factors that make the market risky and uncertain. This will permit to identify measures to take in order to develop a proactive strategy. This section does not take into account inherent trading risks like: logistic risk, country risk, price risk.

Public opinion

Public opinion is a key factor of development. In democracy, public opinion has a very important role to play. We can parallel, as example, the voting on a moratorium on GMO use by Swiss people in 2005. GMO development was consequently slowed down. We can imagine a similar moratorium on biofuels in a high level of democracy country. Such a measure would be dramatic for the development. But it is not likely as the vision of the biofuels negative impact is declining within public opinion. Public opinion is essentially driven by media communication that disseminates ideas among the individual opinions. Biofuels link together energy and food and are hot topics in public beliefs. This makes biofuels easy to critic and caricatures like Figure 3 drive a distorted opinion. Biofuels was the icing on the cake factor of the food crisis. It has been explained that the role of the biofuels was limited. This shows that their reputation suffers from media amplification, which is always easier when something is misunderstood. Most of the people do not understand the real situation of biofuels emergence. There is a lack of rational information and biofuels suffers from the reputation driven by more emotional information. But people must understand that we

are in a transition situation. Biofuels drives investments in agriculture which will develop. This must relax food markets in the coming years. If food crisis persists and people still consider biofuels a main factor. First generation will not develop further. The interviews show the importance of public opinion. In Serge Rusconi's had to withdraw his communication on biodiesel even if the product he used was not interfering with international food market. What people think and know has an important impact on the markets. I feel confident that situation will relax. It will take time as agriculture cannot develop immediately but it will in the coming years.

Policy

The research has point out that EU policy gave the impulsion in order the market to emerge. Policy could also cut the fervour buy reducing the objective and cutting the tax incentive and market would rapidly collapse. Policy will directly depend on the public opinion. But politicians also need to carry out other missions like protecting their industries and hedge energy supply. As analysed before, EU policy still drives the market, through its objectives. Any withdrawal would be extremely costly as many investors and workers expect from biofuels. Policy will anyway get stricter regarding the use of biomass. If food crisis persists and public opinion applies pressure, the use of food commodities may be prohibited and first generation will collapse. The EU 10% objective is valid, but will be hardly reached. Sustainable criteria represent a barrier to entry and their implementation will retard its reach.

Fleet of car

The evolution of the fleet of car will influence the long term potential of biofuels. The energy used in transportation will define the further need of fuel and biofuel. This is a long term issue as the majority of the vehicles will run with fuel engine in the coming decades. The research point out that car manufacturers do not intend to switch technology in the short term. Most of their effort is put into making the fuel consumption more efficient. In Europe, they do not adapt their technology to more specific biofuels requirements. This also shows that they do not consider the biofuel potential important. Biofuels technology is in competition with non-fuel technologies, mostly hydrogen and electricity. As soon as these technologies will reach a significant share in the fleet of car, biofuels will reach the decline phase. But this is a long term issue.

Oil price

A last key factor is the evolution of oil price that is correlated with biofuels. On the long term oil price will remain at a high level. The expensive cost of fossil fuel will drive the demand of biofuels.

5.3 Proposal for commanding key resources and developing fundamental skills

Biofuel is a technology that responds to the demand of energy market. But the production of first and second generations entirely depends on the agriculture market and agriculture ecosystems. The issue regarding the control of sustainability is thus an agricultural concern.

As being intermediaries traders do not necessarily control the feedstock or biofuels production. They are however part of the supply chain and must therefore contribute to the traceability and transparency by moving towards the guarantee of criteria implementation, and thus making the certification process a feasible matter. The most efficient way to meet this requirement is to integrate vertically the production.

The first step that must be done is the investment in production plant. This is a measure that trading companies usually take. The second step is to control directly the feedstock production. This measure is relevant as from this point the company can develop a sustainable management of agricultural system. Such systems exist and are already used in some food producing crops. They must be integrated to the crops bound to biofuels.

The July 2008 review of the World Business Council for Sustainable Development (WBCSD) points out the Integrated Crop Management (ICM). This management system *“balances the economic, social and environmental dimensions of sustainable farming and sets a framework of agricultural practices. These practices comprise a wide portfolio of measures such as soil and nutrient management, crop choice and protection, biodiversity enhancement, and water, energy and landscape management.”*

By integrating such systems, a trading company will be in measure to provide transparency, to control sustainability and thus respond to the certification issue. This measure represents obviously a barrier to entry in terms of investment but it is a necessary proactive strategy as legislation will insist on these questions. Controlling the crops is also a way of hedging the feedstock price.

In addition to vertical integration strategy, a trading company must attend to the evolution of the previously identified developing factors.

A key factor that first generation biofuels investors must measure is the connection that people make between the use of feedstock for biofuels and food crisis. It has been pointed out that the influence of public opinion could have important impact on the market. It is necessary to apprehend the trend of public opinion in order to be able to withdraw if necessary.

Trading companies must also participate in the public discussion within political environment. This will permit to anticipate any political decision. Traders must then take into account the feedback from their in-house lobbyists and integrate a long term vision.

On the long term, it is necessary to pay attention to the evolution of the technologies used in the fleet of car as their emergence will lead the biofuels decline.

As soon as the company can provide the market with a sustainable product, it must communicate about the positive fallouts of the industry and thus influence in a positive way the public opinion.

As the market results uncertain it is worth for a company to put in place a way of getting out of this market and it is required to have an exit strategy.

Conclusion

Biofuel is a growing market and society can take advantage of its development. It is a very sensitive market as it touches several hot topics. At this first step, biofuels are misunderstood by society. Its emergence has distorted commodities markets and public opinion had a strong reaction. But markets will defuse and agriculture will develop, which will get situation back to normal. Compared to other fonts of energy, first generation of biofuels have a limited potential as biomass availability is limited and most of agriculture output must remain within food industry. Further generations will encourage research to create new ways of giving value to biomass.

Investing in biofuels at an international level is worth but it represents an important responsibility. Any companies willing to commerce biofuels must understand the issues and respect some conditions related to agriculture sustainability. Such systems exist and must be implemented to the supply chain.

Biofuels growth is just a new way of producing energy and will only bring a breath of air to relax energy market. It is not a long term solution. It is a human state of mind than gambling on technological tools rather than behavior factors. In unison with technological solutions, society must look up and moderate consumption.

Biofuels intend to be a sustainable industry and can be developed in this direction. Therefore it is essential to work within the whole agriculture value chain. This means that cooperation between all stakeholders is essential. To provide biofuels industry with sustainable products, agriculture engineers, NGO's, investing companies, politicians, and people must join their forces. The actual vulnerable agricultural situation shows the urgency to act, otherwise society will not profit from the biofuels market potential.

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Appendix

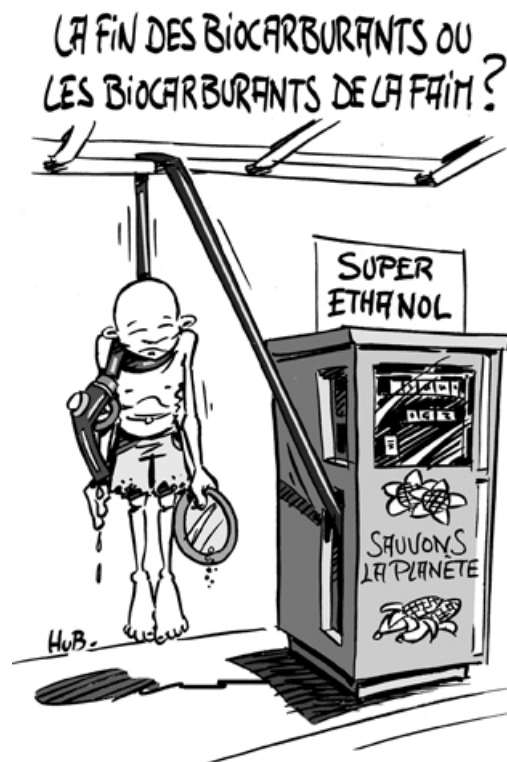


Figure 3 « Les biocarburants remis en question » HuB – www.agoravox.fr 11.06.2008