

FEASIBILITY STUDY PROJECT ALGAEFARM



Index

1. PROJECT OPERATOR	3
1.1. Operator	3
1.2. Constructor	3
1.3. Financing partners / Investors	3
2. TARGET OF THE PROJECT	3
2.1. Economical possibilities	3
2.1.1. Nutritional supplement	3
2.1.2. Vegetable oil	4
2.1.3. Press cake	4
2.2. Industrial management possibilities	4
3. THE MARKETS	4
3.1. Nutritional supplement	4
3.2. Vegetable oil	5
3.3. Press cake – protein containing animal feed	5
3.4. Press cake – bioethanol production	5
4. COMPETITION	5
4.1. Nutritional supplement	5
4.2. Vegetable oil	6
4.2.1. Juridical basic conditions for vegetable oil	6
4.3. Press cake	7
5. ALGAEFARM	7
6. LOCATION	8
7. INFRASTRUCTURE	8
8. FINANCING REQUIREMENT	8
9. FUTURE ENERGY SOURCE BIOHYDROGEN	9
9.1. History	9
9.2. Disadvantages of the present hydrogen production	9
9.3. Advantages of the biological hydrogen production	10
9.4. Hydrogenase	10
9.5. Economy	10
9.6. Conclusion biohydrogen	10
10. BUSINESSPLAN	11
11. SUMMARY	17

1. PROJECT OPERATOR

Project operator is a pool consisting of

Operator,
Constructor,
Financing partners / Investors

1.1. Operator

For the construction and operating of the algae farm an operator's company is founded. An experienced management is entrusted with the implementation of the project. The management has cultivated a lot of contacts in this branch with numerous participants (plant operator, investment builder, scientist...) in Central Europe. Through their extensive experiences and the understanding of the raw material markets and outlets, combined with connections with potential customers, as well as the ability to guarantee the financing for this project, as well as the *know-how* in the plant design and interpretation, is provided, that investments can be moved successfully in a profitable acting algae farm.

1.2. Constructor

The constructors are international acting enterprises and offer partial solutions for the following areas: renewable energy, energy supply, sewage technology and water treatment / hydrosystems, as well as arrangements for the common food industry.

1.3. Financing partners / Investors

Our financing partners / investors are established in the sectors of renewable energy, biogenic fuels, alternative food and on it specified venture capital company's and distinguish themselves to be future-oriented on the one hand and to be capital-strong, on the other hand.

2. TARGET OF THE PROJECT

2.1. Economical possibilities

2.1.1. Nutritional supplement

Spirulina belongs to the type of the cyanobacteria, former called blue algae. A distinction is drawn between 35 kinds. Including for example, *Spirulina platensis*, *Spirulina fusiformis*, *Spirulina maxima*... In spite of all could not be cleared by scientific side yet whether these 35 kinds possibly do not belong, nevertheless, all same kind. A tip to it offers *Spirulina*, because they change, as a function of the nutrient loading and pH factor of the water, their figure. For the growth of 1 kilogram *Spirulina* mass 1.5 kilogram carbone dioxide (CO₂) are converted into 1 kilogram of oxygen (O₂). Under these conditions the production of high-quality food becomes beside the climate also positively influenced.

The dry, green colored preparations show, regarding to their source, a composition difference:

- Proteins: 55–67 %
- Carbohydrate: 10–19%
- Fat: 7–15%
- Mineral substances: 5–9%

In the proteins are all essential amino acids, beta carotene, a preliminary stage of the vitamin A, vitamin B and E, as well as high calcium values, iron values and magnesium values included.

2.1.2. Vegetable oil

Basically the application of renewable energy is achieved not only to the decrease of issues, it also creates new jobs.

By the, in future, increased application of biogenic fuels, on the basis of vegetable oil, energy imports will be also necessary in lower magnitude, what protects the energy supply of the European Union again.

2.1.3. Press cake

At the production of vegetable oil, after squeezing the seed, nuts, algae or fruits, press cake remains as a by-product. Depending on the raw material and according to its quality, the press cake will find different use. It can be used, for example, as protein feed, fertilizer, as a raw material for fermentation gas, as a raw material for the bioethanol production or as a solid fuel. We devote ourselves to the use of the press cake, because we targeted the entire utilisation of all by-products at the oil production. A production process without rubbish.

2.2. Industrial management possibilities

Based on the factors

professional construction,

business analysis,

market knowledge,

it is the target of the project to reach the break even point within 18 months business operation to achieve sustained the profit zone.

3. THE MARKETS

3.1. Nutritional supplement

Nowadays worldwide between eight and nine million tons of algae will be harvested yearly, by which a part is processed to cattle feed, fertilizer or cosmetics. So about 300 000 tons comes, for example, in Japan per year into the food market. The final sales price of 1 kilogram *Spirulina*, as food supplement in powder form, is about 50 Euro.

3.2. Vegetable oil

Due to the EU-DIRECTIVE 2003 / 30 / EC the vegetable oil market for the biodiesel production has in 2010 a volume of at least 11 millions metrical tonnes (EU-25) what corresponds with our retail price of 500.00 Euro / mt for about 5.5 Billion Euro market value.

	2005	2010	2015
Target	2%	5,75%	8%
Diesel consumption ¹	158,6 Mio. t	165 Mio. t ⁴	165 Mio. t ⁵
Biodiesel need	3,69 Mio. t	11 Mio. t	16,7 Mio. t
Floor area ³	2,63 Mio. ha	7,88 Mio. ha	11,92 Mio. ha

Source: Raw material potentials for the production of biodiesel, www.ufop.de, 2006

1 EUROSTAT (2002)

2 Basis: Heat value diesel: 43 MJ/kg, Heat value biodiesel: 37 MJ/kg,

3 Biodiesel income 1,4 t/ha

4 Acceptance: Increase diesel consumption 4%

5 Estimate

3.3. Press cake – protein containing animal feed

At the moment 80 percent of the protein need of the European Union had to be imported. These are 35 million tons in soy groats recompenses, with the costs of about 12 Billion Euro.

3.4. Press cake – bioethanol production

C₂H₅OH – that is the chemical formula of the material which is called colloquially simply alcohol. For chemically interested people it's also known as an ethyl alcohol or spirit of wine. The name bioethanol arises from the production process – the fermentation of sugar- and/or starchy-containing biomass.

The algae clades which produce more carbohydrates than oil can be transformed through fermentation into bioethanol.

4. COMPETITION

4.1. Nutritional supplement

In Central Europe there is one microalgae production plant in Klötze (Altmark). There exists the world-biggest, closed arrangement cultivation of *Chlorella vulgaris* which is pulled up as nutritional supplement.

In the USA some company's are already specialised in the utilisation of algae for nutritional supplement. Inter alia the *Cyanotech Company* which produces *Bioastin*.

Also in Asia exists about 80 algae farms, nevertheless, main attention lies on the food production from macroalgae.

4.2. Vegetable oil

In Europe is every farmer who cultivates oil plants on his fields is a competitor. Because, however, the hectare yield is substantially lower with the conventional oil plants, single farmers are no real competitors.

(De-) centralised oil mills are more likely competitors. However, they depend in their pricing on the world prices, for example rapeseed. We do not have this problem.

Import situation: By the EU-DIRECTIVE 2003 / 30 /EC for the biofuels which intend the obliging application of biofuels in all EU-countries some countries like Brazil, Malaysia or Indonesia, have strengthened steadily on the cultivation of palms for the palm oil production. This, ecologically critical produced, vegetable oil is substantially cheaper than all at the moment available oils like rapeseed oil or soybean oil, however, it can keep up neither in price nor qualitative with our algae oil.

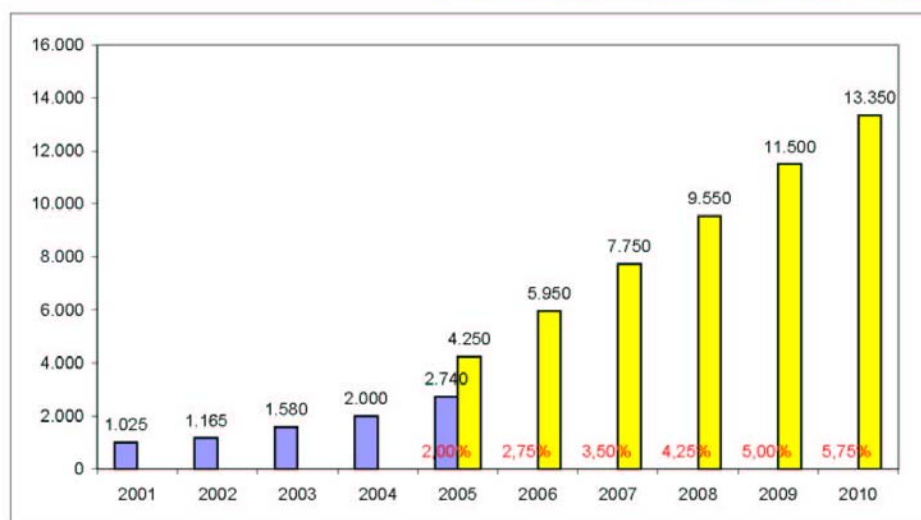
However, in the USA there are about 15 company's which are engaged in the cultivation of algae for the fuel production. Inter alia company's like *Algenol*, *Petro.Algae LLC*, *PetroSun Inc*, *Valcent Products Inc*, *Solazyme Inc*, as well as *Shell*.

4.2.1. Juridical basic conditions for vegetable oil

The biofuel directive EU-DIRECTIVE 2003/30/EC intends the obliging application of biofuels in the transport sector. As of 2005 two percent of a national mileage had to be covered, till 2010 this stake had to rise to 5.75 percent.

Biodieselproduction and Goals EU 25

Year	01.01.2001	01.01.2002	01.01.2003	01.01.2004	01.01.2005	31.12.2005	01.01.2006	01.01.2007	01.01.2008	01.01.2009	01.01.2010
Actual Quantity	1.025	1.165	1.580	2.000	2.740	2,00%	2,75%	3,50%	4,25%	5,00%	5,75%
Directive						4.250	5.950	7.750	9.550	11.500	13.350



4.3. Press cake

Through the fact, that at the vegetable oil production press cake results as a by-product, in Europe is every farmer who cultivates oil plants on his fields a competitor. Because, however, the hectare yield is substantially lower with the conventional oil plants, single farmers are no real competitors.

(De-) centralised oil mills are more likely competitors. However, they depend in their pricing on the world prices, for example rapeseed. We do not have this problem.

5. ALGAEFARM



With a cell diameter of approx. five to ten μm the spherical micro algae is comparable in its dimensions for instance with the red blood corpuscles (7.5 μm).

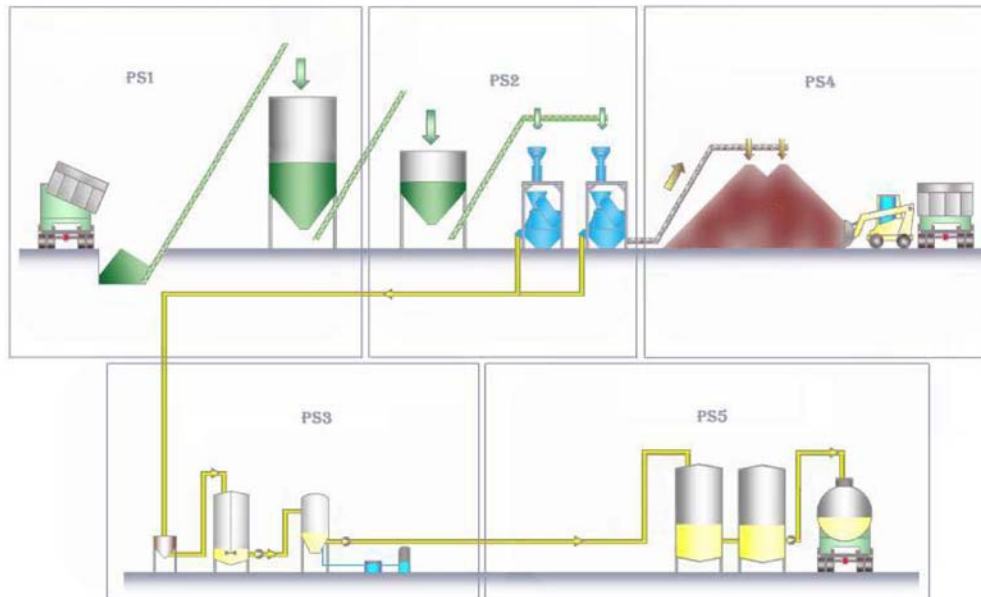
At micro algae their high reproduction rate is particularly remarkable. One individual mother cell splits within 16 - 20 hours in four daughter cells, which itself multiplies again within the next 16 - 20 hours according to the same sample. Regarding to the possible biomass yield per m^2 and time unit the micro algae is superior many times over to all well-known agricultural crops. For the harvest the water with the microalgae had to be pumped through filters and centrifuges and the so won algae mud had to be dried afterwards with hot air.

Dry algae mass originates from it. This product had to be dried, if it should be processed as food supplement once more and had to be pulverised and had to be bottled in suitable containers afterwards, when required.

If the dry algae mass is processed to vegetable oil and press cake, this happens as follows:

- the algae mass (PS 1)
- will be moved in a press (PS 2),
- after the pressing the vegetable oil is centrifuged several times, dried, degumed, filtered, (PS 3),
- finally stored in suitable tanks (PS 5),
- during the press cake is moved to a storage silo (PS 4).

PRESS SHOP



6. LOCATION

The eligible area had to be flat. The location will be within the European Union and near a railroad station. Due to the low property prices, the favorable manpower and the flat tax, a location is planned in the Slovakian Republic.

Other production units within the Slovakian Republic, in Hungary, in Romania, in Bulgaria and in Portugal are in our short term strategy and are implemented within 18 to 24 months.

Minimum requirements:

~55 hectare acreage

~2000 sqm production unit

~3000 sqm for handling and storage

7. INFRASTRUCTURE

A connection with various supply units like electricity and gas are not urgently necessary, because the required electricity can be generated independent.

Disposal costs are cancelled.

However, the water supply is indispensable.

8. FINANCING REQUIREMENT

The whole financing requirement for the project is 15 million Euro.

9. FUTURE ENERGY SOURCE BIOHYDROGEN

9.1. History

In 1939 noted *Hans Gaffron*, who was active at the University of Chicago, that certain green algae switched over now and again from the oxygen production to the hydrogen production. *Gaffron* has never found out the reason, just like as few scientists after him.

In the 1990s discovered *Anastasios Melis*, scientists at the University of California, that with sulphur lack the algae begin to change their normal photosynthesis and to generate hydrogen. He also discovered that the enzyme *Hydrogenase* is responsible for this. However, this enzyme loses his function if it comes to contact with oxygen. *Melis* discovered that with sulphur lack the internal oxygen flow is disturbed in the algae creates a sphere in which the enzyme *Hydrogenase* can develop, and so algae become hydrogen producers.

The use of hydrogen as an energy source underlies especially in its physical properties. With about 120,000 kJ/kg hydrogen has a huge higher weight-related heat value (energy density) than fossil energy sources like coal (29,400 kJ/kg), petrol (43,200 kJ/kg) or natural gas (49,700 kJ/kg). Covered to the volume, nevertheless, liquid hydrogen lies with 8,600 MJ / m³ only at 20 percent of the energy density of coal, 22 percent of petrol and 41 percent of natural gas. The energy density of gaseous hydrogen lies, even under high pressure of 100 bar, still far under it. The high energy density still makes the use of hydrogen as an energy memory and energy-transport-media extremely efficient. Furthermore forms with its combustion in aerial-fed engines beside comparatively very small quantities of nitrogen oxids, excluding steam. By the production of electric energy of hydrogen and air in fuel cells (catalytic combustion) is the end product water.

9.2. Disadvantages of the present hydrogen production

Hydrogen is only a energy carrier. To its production energy is used. Due to of its big responsiveness hydrogen on the earth hardly seems unbound, and there are no natural fields which could be opened. So the hydrogen must be won through energy-costly segmentation procedures. A distinction at the production is drawn between the input of primary energy sources and secondary energy sources. The primary-energetic hydrogen production occurs above all of hydrocarbons, mainly natural gas, oil and coal. The energy, which is necessary for the decomposition, is provided *autotherm*, through the combustion of a part of the input energy source. As *autotherm* in the industrial chemistry reactions are called, if *exotherme* and an *endotherme* reactions run parallel, so that the whole process runs off external heat input. The secondary-energetic production of hydrogen happens predominant via electricity, the electrolysis. The electrolysis is independent of the kind of the used primary energy source and demonstrate therefore the main pillar of a regenerative hydrogen energy industry. Therefore electricity from hydroelectric power plants, tidal power stations or wind power plants can be pulled up for the hydrogen production.

- H₂ is won by refinement from fossil sources.
- The production of methane needs expensive platinum catalysts.
- The process needs more energy than in the fuel cell can be produced.
- Through the production of one ton H₂ three tons CO₂ will be released.

9.3. Advantages of the biological hydrogen production

Algae, which can form hydrogen gas with the help of solar energy, are ideally suited for the environmentally friendly production of hydrogen. Only their, to the photo-synthetic water splitting coupled hydrogen production, appears a cyclic system, where though the use of the product (hydrogen) as an energy source only the substrate of the reaction (water) will be released.

- The substrate (H₂O) and the energy source (sunlight) are very cheap and are available indefinitely.
- The product (H₂) is nontoxic, can be stored and is environmentally friendly.
- The system is cyclic, that means that the use of the product (H₂) regenerates the substrate (H₂O).
- CO₂ neutrality, because through the photosynthesis of the algae a huge amount of CO₂ will be bounded.

9.4. Hydrogenase

At his investigations to the fermentation processes in the river mud, the German biochemist *Hoppe-Seyler* discovered at the end of the 19th century that bacteria take up molecular hydrogen as well as they release. Since that time, the *hydrogen metabolism* at micro-organisms was scrutinized. In 1931 the enzyme, which was involved in these processes, received the name *Hydrogenase*. During the next years could be in series of experiments on bacteria and algae, *Trichomonades* and *Ciliates* detected. Also in some mushrooms, mosses and higher plants, *Hydrogenaseactivity* could be measured. Through the possible contamination through bacteria the results are contended. The enzyme *Hydrogenase* catalyzes the oxidative splitting of molecular hydrogen to protons and electrons, as well as the reductive generation of hydrogen from protons.

9.5. Economy

An algae farm, in the size of Texas, could produce enough hydrogen to supply the whole world. An algae farm, with an expansion of 25 000 square kilometres, has the ability to cover the whole mileage of the USA. This is less than just a tenth of the surface which takes the soya production.

9.6. Conclusion biohydrogen

As soon as the technology was optimised in the areas of storage, transport and supply, we have the necessary production surfaces to take a market-dominating position in the energy market.

10. BUSINESSPLAN

<i>Businessplan algae farm</i>					
<i>Output 36000 mt (metric tons) algae mass (100 mt / day)</i>					
<i>Output 900 metric tons nutritional supplement - 17550 metric tons vegetable oil – 17550 metric tons press cake</i>					
Capital costs	1.st year	1st quarter	2nd quarter	3rd quarter	4th quarter
Algae farm	€ 9.800.000,00				
Algae press	€ 154.500,00				
Filter	€ 7.920,00				
Vacuum Dryer	€ 39.000,00				
Desmarming unit	€ 150.000,00				
Storage	€ 1.000.000,00				
Centrifuges	€ 200.000,00				
Building area 600000 m2	€ 400.000,00				
unforeseen circumstance	€ 3.248.580,00				
<i>Capital costs (Cc)</i>	€ 15.000.000,00				
<i>Costs algae/ fertilizer</i>	€ 7.000.000,00	€ 1.750.000,00	€ 1.750.000,00	€ 1.750.000,00	€ 1.750.000,00
Personnel costs					
Executive producer - 1 person	€ 40.000,00	€ 10.000,00	€ 10.000,00	€ 10.000,00	€ 10.000,00
Operation staff - 10 persons	€ 300.000,00	€ 75.000,00	€ 75.000,00	€ 75.000,00	€ 75.000,00
Laboratory staff - 1 person	€ 30.000,00	€ 7.500,00	€ 7.500,00	€ 7.500,00	€ 7.500,00
<i>Personnel costs</i>	€ 370.000,00	€ 92.500,00	€ 92.500,00	€ 92.500,00	€ 92.500,00
Cost of operation					
Maintenance 1,5 % of CC	€ 225.000,00	€ 56.250,00	€ 56.250,00	€ 56.250,00	€ 56.250,00
Insurance 0,7 % of CC	€ 105.000,00	€ 26.250,00	€ 26.250,00	€ 26.250,00	€ 26.250,00
Savings 0,83 % of CC	€ 124.500,00	€ 31.125,00	€ 31.125,00	€ 31.125,00	€ 31.125,00
Costs for edv 0,47 % of CC	€ 70.500,00	€ 17.625,00	€ 17.625,00	€ 17.625,00	€ 17.625,00
<i>Cost of operation</i>	€ 525.000,00	€ 131.250,00	€ 131.250,00	€ 131.250,00	€ 131.250,00
Revenues					
Selling price nutritional supplement 15.000 / mt	€ 13.500.000,00	€ 3.375.000,00	€ 3.375.000,00	€ 3.375.000,00	€ 3.375.000,00
Selling price vegetable oil € 500 / mt	€ 8.775.000,00	€ 2.193.750,00	€ 2.193.750,00	€ 2.193.750,00	€ 2.193.750,00
Selling price press cake € 400 / mt	€ 7.020.000,00	€ 1.755.000,00	€ 1.755.000,00	€ 1.755.000,00	€ 1.755.000,00
<i>Revenues</i>	€ 29.295.000,00	€ 7.323.750,00	€ 7.323.750,00	€ 7.323.750,00	€ 7.323.750,00

Overall costs	1.st year	1st quarter	2nd quarter	3rd quarter	4th quarter
Costs algae/fertilizer	€ 7.000.000,00	€ 1.750.000,00	€ 1.750.000,00	€ 1.750.000,00	€ 1.750.000,00
Personnel costs	€ 370.000,00	€ 92.500,00	€ 92.500,00	€ 92.500,00	€ 92.500,00
Cost of operation	€ 525.000,00	€ 131.250,00	€ 131.250,00	€ 131.250,00	€ 131.250,00
Overall costs	€ 7.895.000,00	€ 1.973.750,00	€ 1.973.750,00	€ 1.973.750,00	€ 1.973.750,00
Gain/loss calculation					
Revenues	€ 29.295.000,00	€ 7.323.750,00	€ 7.323.750,00	€ 7.323.750,00	€ 7.323.750,00
Minus overall costs	€ 7.895.000,00	€ 1.973.750,00	€ 1.973.750,00	€ 1.973.750,00	€ 1.973.750,00
Yield	€ 21.400.000,00	€ 5.350.000,00	€ 5.350.000,00	€ 5.350.000,00	€ 5.350.000,00
CC-amortization 5 years	€ 3.000.000,00	€ 750.000,00	€ 750.000,00	€ 750.000,00	€ 750.000,00
Gross yield	€ 18.400.000,00	€ 4.600.000,00	€ 4.600.000,00	€ 4.600.000,00	€ 4.600.000,00
minus taxes	€ 3.496.000,00	€ 874.000,00	€ 874.000,00	€ 874.000,00	€ 874.000,00
Company profit	€ 6.252.000,00	€ 3.726.000,00	€ 3.726.000,00	€ 3.726.000,00	€ 3.726.000,00
Fixed interest rate 8 %	€ 1.200.000,00	€ 300.000,00	€ 300.000,00	€ 300.000,00	€ 300.000,00
Profitsharing 50 %	€ 7.452.000,00	€ 1.863.000,00	€ 1.863.000,00	€ 1.863.000,00	€ 1.863.000,00
Investor's profit	€ 8.652.000,00	€ 2.163.000,00	€ 2.163.000,00	€ 2.163.000,00	€ 2.163.000,00

Running expenses	2nd year	1st quarter	2nd quarter	3rd quarter	4th quarter
<i>Costs algae/ fertilizer</i>	€ 7.000.000,00	€ 1.750.000,00	€ 1.750.000,00	€ 1.750.000,00	€ 1.750.000,00
Personnel costs					
Executive producer - 1 person	€ 40.000,00	€ 10.000,00	€ 10.000,00	€ 10.000,00	€ 10.000,00
Operation staff - 10 persons	€ 300.000,00	€ 75.000,00	€ 75.000,00	€ 75.000,00	€ 75.000,00
Laboratory staff - 1 person	€ 30.000,00	€ 7.500,00	€ 7.500,00	€ 7.500,00	€ 7.500,00
<i>Personnel costs</i>	€ 370.000,00	€ 92.500,00	€ 92.500,00	€ 92.500,00	€ 92.500,00
Cost of operation					
Maintenance 1,5 % of CC	€ 225.000,00	€ 56.250,00	€ 56.250,00	€ 56.250,00	€ 56.250,00
Insurance 0,7 % of CC	€ 105.000,00	€ 26.250,00	€ 26.250,00	€ 26.250,00	€ 26.250,00
Savings 0,83 % of CC	€ 124.500,00	€ 31.125,00	€ 31.125,00	€ 31.125,00	€ 31.125,00
Costs for edv 0,47 % of CC	€ 70.500,00	€ 17.625,00	€ 17.625,00	€ 17.625,00	€ 17.625,00
<i>Cost of operation</i>	€ 525.000,00	€ 131.250,00	€ 131.250,00	€ 131.250,00	€ 131.250,00
Revenues					
Selling price nutritional supplement 15.000 / mt	€ 13.500.000,00	€ 3.375.000,00	€ 3.375.000,00	€ 3.375.000,00	€ 3.375.000,00
Selling price vegetable oil € 500 / mt	€ 8.775.000,00	€ 2.193.750,00	€ 2.193.750,00	€ 2.193.750,00	€ 2.193.750,00
Selling price press cake € 400 / mt	€ 7.020.000,00	€ 1.755.000,00	€ 1.755.000,00	€ 1.755.000,00	€ 1.755.000,00
<i>Revenues</i>	€ 29.295.000,00	€ 7.323.750,00	€ 7.323.750,00	€ 7.323.750,00	€ 7.323.750,00
Overall costs					
Costs algae/fertilizer	€ 7.000.000,00	€ 1.750.000,00	€ 1.750.000,00	€ 1.750.000,00	€ 1.750.000,00
Personnel costs	€ 370.000,00	€ 92.500,00	€ 92.500,00	€ 92.500,00	€ 92.500,00
Cost of operation	€ 525.000,00	€ 131.250,00	€ 131.250,00	€ 131.250,00	€ 131.250,00
<i>Overall costs</i>	€ 7.895.000,00	€ 1.973.750,00	€ 1.973.750,00	€ 1.973.750,00	€ 1.973.750,00
Gain/loss calculation					
Revenues	€ 29.295.000,00	€ 7.323.750,00	€ 7.323.750,00	€ 7.323.750,00	€ 7.323.750,00
Minus overall costs	€ 7.895.000,00	€ 1.973.750,00	€ 1.973.750,00	€ 1.973.750,00	€ 1.973.750,00
Yield	€ 21.400.000,00	€ 5.350.000,00	€ 5.350.000,00	€ 5.350.000,00	€ 5.350.000,00
CC-amortization 5 years	€ 3.000.000,00	€ 750.000,00	€ 750.000,00	€ 750.000,00	€ 750.000,00
Gross yield	€ 18.400.000,00	€ 4.600.000,00	€ 4.600.000,00	€ 4.600.000,00	€ 4.600.000,00
minus taxes	€ 3.496.000,00	€ 874.000,00	€ 874.000,00	€ 874.000,00	€ 874.000,00
<i>Company profit</i>	€ 6.252.000,00	€ 3.726.000,00	€ 3.726.000,00	€ 3.726.000,00	€ 3.726.000,00
Fixed interest rate 8 %	€ 1.200.000,00	€ 300.000,00	€ 300.000,00	€ 300.000,00	€ 300.000,00
Profitsharing 50 %	€ 7.452.000,00	€ 1.863.000,00	€ 1.863.000,00	€ 1.863.000,00	€ 1.863.000,00
Investor's profit	€ 8.652.000,00	€ 2.163.000,00	€ 2.163.000,00	€ 2.163.000,00	€ 2.163.000,00

Running expenses	3rd year	1st quarter	2nd quarter	3rd quarter	4th quarter
Costs algae/ fertilizer	€ 7.000.000,00	€ 1.750.000,00	€ 1.750.000,00	€ 1.750.000,00	€ 1.750.000,00
Personnel costs					
Executive producer - 1 person	€ 40.000,00	€ 10.000,00	€ 10.000,00	€ 10.000,00	€ 10.000,00
Operation staff - 10 persons	€ 300.000,00	€ 75.000,00	€ 75.000,00	€ 75.000,00	€ 75.000,00
Laboratory staff - 1 person	€ 30.000,00	€ 7.500,00	€ 7.500,00	€ 7.500,00	€ 7.500,00
Personnel costs	€ 370.000,00	€ 92.500,00	€ 92.500,00	€ 92.500,00	€ 92.500,00
Cost of operation					
Maintenance 1,5 % of CC	€ 225.000,00	€ 56.250,00	€ 56.250,00	€ 56.250,00	€ 56.250,00
Insurance 0,7 % of CC	€ 105.000,00	€ 26.250,00	€ 26.250,00	€ 26.250,00	€ 26.250,00
Savings 0,83 % of CC	€ 124.500,00	€ 31.125,00	€ 31.125,00	€ 31.125,00	€ 31.125,00
Costs for edv 0,47 % of CC	€ 70.500,00	€ 17.625,00	€ 17.625,00	€ 17.625,00	€ 17.625,00
Cost of operation	€ 525.000,00	€ 131.250,00	€ 131.250,00	€ 131.250,00	€ 131.250,00
Revenues					
Selling price nutritional supplement 15.000 / mt	€ 13.500.000,00	€ 3.375.000,00	€ 3.375.000,00	€ 3.375.000,00	€ 3.375.000,00
Selling price vegetable oil € 500 / mt	€ 8.775.000,00	€ 2.193.750,00	€ 2.193.750,00	€ 2.193.750,00	€ 2.193.750,00
Selling price press cake € 400 / mt	€ 7.020.000,00	€ 1.755.000,00	€ 1.755.000,00	€ 1.755.000,00	€ 1.755.000,00
Revenues	€ 29.295.000,00	€ 7.323.750,00	€ 7.323.750,00	€ 7.323.750,00	€ 7.323.750,00
Overall costs					
Costs algae/fertilizer	€ 7.000.000,00	€ 1.750.000,00	€ 1.750.000,00	€ 1.750.000,00	€ 1.750.000,00
Personnel costs	€ 370.000,00	€ 92.500,00	€ 92.500,00	€ 92.500,00	€ 92.500,00
Cost of operation	€ 525.000,00	€ 131.250,00	€ 131.250,00	€ 131.250,00	€ 131.250,00
Overall costs	€ 7.895.000,00	€ 1.973.750,00	€ 1.973.750,00	€ 1.973.750,00	€ 1.973.750,00
Gain/loss calculation					
Revenues	€ 29.295.000,00	€ 7.323.750,00	€ 7.323.750,00	€ 7.323.750,00	€ 7.323.750,00
Minus overall costs	€ 7.895.000,00	€ 1.973.750,00	€ 1.973.750,00	€ 1.973.750,00	€ 1.973.750,00
Yield	€ 21.400.000,00	€ 5.350.000,00	€ 5.350.000,00	€ 5.350.000,00	€ 5.350.000,00
CC-amortization 5 years	€ 3.000.000,00	€ 750.000,00	€ 750.000,00	€ 750.000,00	€ 750.000,00
Gross yield	€ 18.400.000,00	€ 4.600.000,00	€ 4.600.000,00	€ 4.600.000,00	€ 4.600.000,00
minus taxes	€ 3.496.000,00	€ 874.000,00	€ 874.000,00	€ 874.000,00	€ 874.000,00
Company profit	€ 6.252.000,00	€ 3.726.000,00	€ 3.726.000,00	€ 3.726.000,00	€ 3.726.000,00
Fixed interest rate 8 %	€ 1.200.000,00	€ 300.000,00	€ 300.000,00	€ 300.000,00	€ 300.000,00
Profitsharing 50 %	€ 7.452.000,00	€ 1.863.000,00	€ 1.863.000,00	€ 1.863.000,00	€ 1.863.000,00
Investor's profit	€ 8.652.000,00	€ 2.163.000,00	€ 2.163.000,00	€ 2.163.000,00	€ 2.163.000,00

Running expenses	4th year	1st quarter	2nd quarter	3rd quarter	4th quarter
Costs algae/ fertilizer	€ 7.000.000,00	€ 1.750.000,00	€ 1.750.000,00	€ 1.750.000,00	€ 1.750.000,00
Personnel costs					
Executive producer - 1 person	€ 40.000,00	€ 10.000,00	€ 10.000,00	€ 10.000,00	€ 10.000,00
Operation staff - 10 persons	€ 300.000,00	€ 75.000,00	€ 75.000,00	€ 75.000,00	€ 75.000,00
Laboratory staff - 1 person	€ 30.000,00	€ 7.500,00	€ 7.500,00	€ 7.500,00	€ 7.500,00
Personnel costs	€ 370.000,00	€ 92.500,00	€ 92.500,00	€ 92.500,00	€ 92.500,00
Cost of operation					
Maintenance 1,5 % of CC	€ 225.000,00	€ 56.250,00	€ 56.250,00	€ 56.250,00	€ 56.250,00
Insurance 0,7 % of CC	€ 105.000,00	€ 26.250,00	€ 26.250,00	€ 26.250,00	€ 26.250,00
Savings 0,83 % of CC	€ 124.500,00	€ 31.125,00	€ 31.125,00	€ 31.125,00	€ 31.125,00
Costs for edv 0,47 % of CC	€ 70.500,00	€ 17.625,00	€ 17.625,00	€ 17.625,00	€ 17.625,00
Cost of operation	€ 525.000,00	€ 131.250,00	€ 131.250,00	€ 131.250,00	€ 131.250,00
Revenues					
Selling price nutritional supplement 15.000 / mt	€ 13.500.000,00	€ 3.375.000,00	€ 3.375.000,00	€ 3.375.000,00	€ 3.375.000,00
Selling price vegetable oil € 500 / mt	€ 8.775.000,00	€ 2.193.750,00	€ 2.193.750,00	€ 2.193.750,00	€ 2.193.750,00
Selling price press cake € 400 / mt	€ 7.020.000,00	€ 1.755.000,00	€ 1.755.000,00	€ 1.755.000,00	€ 1.755.000,00
Revenues	€ 29.295.000,00	€ 7.323.750,00	€ 7.323.750,00	€ 7.323.750,00	€ 7.323.750,00
Overall costs					
Costs algae/fertilizer	€ 7.000.000,00	€ 1.750.000,00	€ 1.750.000,00	€ 1.750.000,00	€ 1.750.000,00
Personnel costs	€ 370.000,00	€ 92.500,00	€ 92.500,00	€ 92.500,00	€ 92.500,00
Cost of operation	€ 525.000,00	€ 131.250,00	€ 131.250,00	€ 131.250,00	€ 131.250,00
Overall costs	€ 7.895.000,00	€ 1.973.750,00	€ 1.973.750,00	€ 1.973.750,00	€ 1.973.750,00
Gain/loss calculation					
Revenues	€ 29.295.000,00	€ 7.323.750,00	€ 7.323.750,00	€ 7.323.750,00	€ 7.323.750,00
Minus overall costs	€ 7.895.000,00	€ 1.973.750,00	€ 1.973.750,00	€ 1.973.750,00	€ 1.973.750,00
Yield	€ 21.400.000,00	€ 5.350.000,00	€ 5.350.000,00	€ 5.350.000,00	€ 5.350.000,00
CC-amortization 5 years	€ 3.000.000,00	€ 750.000,00	€ 750.000,00	€ 750.000,00	€ 750.000,00
Gross yield	€ 18.400.000,00	€ 4.600.000,00	€ 4.600.000,00	€ 4.600.000,00	€ 4.600.000,00
minus taxes	€ 3.496.000,00	€ 874.000,00	€ 874.000,00	€ 874.000,00	€ 874.000,00
Company profit	€ 6.252.000,00	€ 3.726.000,00	€ 3.726.000,00	€ 3.726.000,00	€ 3.726.000,00
Fixed interest rate 8 %	€ 1.200.000,00	€ 300.000,00	€ 300.000,00	€ 300.000,00	€ 300.000,00
Profitsharing 50 %	€ 7.452.000,00	€ 1.863.000,00	€ 1.863.000,00	€ 1.863.000,00	€ 1.863.000,00
Investor's profit	€ 8.652.000,00	€ 2.163.000,00	€ 2.163.000,00	€ 2.163.000,00	€ 2.163.000,00

Running expenses	5th year	1st quarter	2nd quarter	3rd quarter	4th quarter
Costs algae/ fertilizer	€ 7.000.000,00	€ 1.750.000,00	€ 1.750.000,00	€ 1.750.000,00	€ 1.750.000,00
Personnel costs					
Executive producer - 1 person	€ 40.000,00	€ 10.000,00	€ 10.000,00	€ 10.000,00	€ 10.000,00
Operation staff - 10 persons	€ 300.000,00	€ 75.000,00	€ 75.000,00	€ 75.000,00	€ 75.000,00
Laboratory staff - 1 person	€ 30.000,00	€ 7.500,00	€ 7.500,00	€ 7.500,00	€ 7.500,00
Personnel costs	€ 370.000,00	€ 92.500,00	€ 92.500,00	€ 92.500,00	€ 92.500,00
Cost of operation					
Maintenance 1,5 % of CC	€ 225.000,00	€ 56.250,00	€ 56.250,00	€ 56.250,00	€ 56.250,00
Insurance 0,7 % of CC	€ 105.000,00	€ 26.250,00	€ 26.250,00	€ 26.250,00	€ 26.250,00
Savings 0,83 % of CC	€ 124.500,00	€ 31.125,00	€ 31.125,00	€ 31.125,00	€ 31.125,00
Costs for edv 0,47 % of CC	€ 70.500,00	€ 17.625,00	€ 17.625,00	€ 17.625,00	€ 17.625,00
Cost of operation	€ 525.000,00	€ 131.250,00	€ 131.250,00	€ 131.250,00	€ 131.250,00
Revenues					
Selling price nutritional supplement 15.000 / mt	€ 13.500.000,00	€ 3.375.000,00	€ 3.375.000,00	€ 3.375.000,00	€ 3.375.000,00
Selling price vegetable oil € 500 / mt	€ 8.775.000,00	€ 2.193.750,00	€ 2.193.750,00	€ 2.193.750,00	€ 2.193.750,00
Selling price press cake € 400 / mt	€ 7.020.000,00	€ 1.755.000,00	€ 1.755.000,00	€ 1.755.000,00	€ 1.755.000,00
Revenues	€ 29.295.000,00	€ 7.323.750,00	€ 7.323.750,00	€ 7.323.750,00	€ 7.323.750,00
Overall costs					
Costs algae/fertilizer	€ 7.000.000,00	€ 1.750.000,00	€ 1.750.000,00	€ 1.750.000,00	€ 1.750.000,00
Personnel costs	€ 370.000,00	€ 92.500,00	€ 92.500,00	€ 92.500,00	€ 92.500,00
Cost of operation	€ 525.000,00	€ 131.250,00	€ 131.250,00	€ 131.250,00	€ 131.250,00
Overall costs	€ 7.895.000,00	€ 1.973.750,00	€ 1.973.750,00	€ 1.973.750,00	€ 1.973.750,00
Gain/loss calculation					
Revenues	€ 29.295.000,00	€ 7.323.750,00	€ 7.323.750,00	€ 7.323.750,00	€ 7.323.750,00
Minus overall costs	€ 7.895.000,00	€ 1.973.750,00	€ 1.973.750,00	€ 1.973.750,00	€ 1.973.750,00
Yield	€ 21.400.000,00	€ 5.350.000,00	€ 5.350.000,00	€ 5.350.000,00	€ 5.350.000,00
CC-amortization 5 years	€ 3.000.000,00	€ 750.000,00	€ 750.000,00	€ 750.000,00	€ 750.000,00
Gross yield	€ 18.400.000,00	€ 4.600.000,00	€ 4.600.000,00	€ 4.600.000,00	€ 4.600.000,00
minus taxes	€ 3.496.000,00	€ 874.000,00	€ 874.000,00	€ 874.000,00	€ 874.000,00
Company profit	€ 6.252.000,00	€ 3.726.000,00	€ 3.726.000,00	€ 3.726.000,00	€ 3.726.000,00
Fixed interest rate 8 %	€ 1.200.000,00	€ 300.000,00	€ 300.000,00	€ 300.000,00	€ 300.000,00
Profitsharing 50 %	€ 7.452.000,00	€ 1.863.000,00	€ 1.863.000,00	€ 1.863.000,00	€ 1.863.000,00
Investor's profit	€ 8.652.000,00	€ 2.163.000,00	€ 2.163.000,00	€ 2.163.000,00	€ 2.163.000,00

11. SUMMARY

Project Algaefarm

Project operator/partner:

Pool consisting of:

- Operator
- Constructor
- Financing partners / Investors

Individuals:

- Operator team consisting of experienced people with economic-technical background and international practise
- Constructor with experience in the area renewable raw materials
- Investors with suitable capital background

Project size:

- About 15 million Euro for construction, building, property and infrastructure
- Targeted turnover about 29 million Euro p.a.
- Targeted result after taxes about 14 million Euro p.a.

Project output:

- 36 thousand metrical tons of dry algae mass

Location:

- Within the European Union, depending on square metre price (maximum 1 euro/square metre)

Logistics:

- Railroad station must be nearby

Production:

- Nutritional supplement
- Vegetable oil
- Press cake

Financing requirement:

- The whole financing requirement for the project is 15 million Euro



Headquarter:

Zámocká 30
81101 Bratislava

E-mail : office@kgrf.eu
Web : <http://www.kgrf.eu>