CASS
BUSINESS SCHOOL
CITY, UNIVERSITY OF LONDON
EST 1894

Group Coursework Submission Form

Specialist Masters Programme

Please list all names of group members: 1. Moreno Arroyo, Daniel 2. Tucci Castro, Martin 3. Tipikin, Vitalii	4. Kourtesis, Michail 5. Yang, Zeyong **GROUP NUMBER:** **15**
MSc in: Energy/Shipping, Trade and Finance	
Module Code: SMM624	
Module Title: Research Methods for Trade and Finance Professionals	
Lecturer: Amir Alizadeh, Nikos Nomikos, Nikos Papapostolou, Panos Pouliasis and Michael Tamvakis	**Submission Date:** 02/04/2017

Declaration:

By submitting this work, we declare that this work is entirely our own except those parts duly identified and referenced in my submission. It complies with any specified word limits and the requirements and regulations detailed in the coursework instructions and any other relevant programme and module documentation. In submitting this work we acknowledge that we have read and understood the regulations and code regarding academic misconduct, including that relating to plagiarism, as specified in the Programme Handbook. We also acknowledge that this work will be subject to a variety of checks for academic misconduct.

We acknowledge that work submitted late without a granted extension will be subject to penalties, as outlined in the Programme Handbook. Penalties will be applied for a maximum of five days lateness, after which a mark of zero will be awarded.

Marker's Comments (if not being marked on-line):

Deduction for Late Submission: _____ **Final Mark:** _____ %

2017

Construction and Operation of a Biodiesel Plant in Russia

MSc Energy/Shipping, Trade & Finance 2016/2017

SMM534 Research Methods for Trade and Finance Professionals

Cass Business School

Group 15

Vitalii Tipikin

Martin Tucci

Daniel Moreno

Michael Kourtesis

Zeyong Yang

Contents

Executive Summary

Russian Biofuels & Co, a subsidiary of Cass PLC, is proposing the board of directors to proceed with the following business opportunity: a construction of a biodiesel plant in Russia. Having scrutinised the commodity's market, we have observed a gap in the countries of the European Union and Sweden in particular, which is anticipated to have a steady increase in biofuels consumption.

We seek to construct the plant in the Saint-Petersburg region due to it great rapeseed production potential and optimal transportation infrastructure available, including a strategic port and a well-developed rail network. Apart from the main product – Biodiesel - which is expected to be produced from rapeseeds, we anticipate to have an additional stream of cash flows achieved by selling by-products, mainly glycerol and rapeseed meal. The targeted market for these goods is Moscow area.

The plant has a maximum capacity of 60 million litters of Biodiesel B100 per year. However production will start with 38 million on a conservative scenario, and will be transported once every two months via ship to port of Gothenburg, Sweden.

Initial investment required from CASS PLC are USD 17,500,000. Based on the market research and sector analysis our CFO has prepared our projected financial statements and several ratios to help the board of directors analyse the feasibility of this investment opportunity. Having run a scenario analysis, we obtained an expected NPV figure of $ 23,795,612 for the 15 year project and expected IRR of 25%, which exceeds the company's cost of capital significantly. The payback period of the initial investment is 3 years and 3 months.

Finally, some exit strategies has been considered in case CASS PLC decides to sell or share a portion of the business with new investors in the long term.

1. Project Description and Justification

1.1. Introduction to biodiesel industry – Overview

Renewable energy is traditionally perceived as the solution for the global problem of energy sustainability and oil dependency. After the oil crises and price shocks from 1970's and onwards the world showed great interest in the adoption and evolution of renewable fuels, which unlike fossil fuels can regenerate. Consequently, liquid biofuels would contribute to the savings of decreasing fossil fuels reserves and help meet the rising demand for energy consumption that is projected to grow by 48% by 2040 as the U.S. Energy Information Administration reports (2016).

The EU is the world's largest biodiesel producer with the first biofuel developed and used in the EU in the transport sector in 1990s. Increasing oil prices, the Blair House Agreement and generous tax incentives, mainly in Germany and France, drove the rapid expansion at that time. In addition, the EU biofuels goals set out in the "Renewable Energy Directive" has further pushed the use of biodiesel. On April 6 2009, the European Council has adopted "The EU Energy and Climate change package", including the "Renewable energy Directive" (Official Journal of the European Union, 2009) which required implementation of:

1. 20 % reduction of Green House Gases compared to 1990 levels.
2. 20 % improvement in energy efficiency compared to forecasts for 2020.
3. 20 % share for renewable energy in the EU total energy mix with a minimum of 10% target of renewable energy consumed by the transport sector.

Today the demand for biofuels continues to be highly influenced by domestic policies in conjunction with sustained fuel demand across the world.

1.2. History of the Business

The business activity of producing biodiesel in Russia is intended to fill the market gap that was observed in certain countries of the EU in terms of Biofuels, and will provide a financial opportunity for investors willing to join this promising industry. The business will generate cash by selling biodiesel to EU countries, Sweden in particular. Additionally, by-products, mainly glycerol and rapeseed meal, will be sold separately in the local market and provide a significant extra cash flow for the company.

2. Market analysis.

2.1. Overall

Biodiesel is the most traded biofuel in the EU representing about 80% of the total transport biofuels market. OECD agricultural report (2016) states, the world production is estimated to increase from 33.2 million litres in 2016 to 41.4 million litres in 2025 (App. Figure 1). The European Union's production for 2017 is predicted to be 14,155, thus showing a 35% increase since 2010 and 3.35% since 2016. Although imports of biodiesel have fallen dramatically: from 2,400 (million litres) in 2010 to 545 in 2017 (European Biodiesel Board, 2016), there is still a high potential for producers to penetrate the market and fill in this gap. It should be noted that the imports are predicted to increase by 15 million litres compared to 2016 figure (App. Figure 2).

Today, according to Global Agricultural Information Network (2016), biodiesel consumption is driven almost exclusively by Member State mandates and to a lesser extent by tax incentives. In 2016 the main consumers of biodiesel within the EU were France – 3.27 (million litres), Germany – 2.39 and Italy – 1.32. From the conducted market research, it becomes evident that there is a steady growth in its consumption today. The forecasted consumption increase of 2.8% - 315 million litres in 2017 is attributed to the mandates increase in Sweden, Spain, Portugal, Netherlands, United Kingdom and total diesel consumption in France. The biggest growth is expected in the United Kingdom, from 910 thousand litres to 1.02 million litres in 2017. Also, a substantial growth is anticipated in Sweden - 70 million litres (App. Figure 3). In addition, IEA (2016) "450 Scenario" states that the demand for biofuels and road biodiesel in particular will grow rapidly around the world, which will account for 20% of all liquid transport fuel by 2040. The lion share of this growth is attributed to the European Union (App. Figure 4).

2.2. Competition.

Historically, the biggest suppliers of biodiesel to EU have been Argentina, which is also the world's leading exporter (OECD, 2016) and Indonesia, accounting to 90 percent of total imports. However, in November 2013, the EC published regulation 1194/2013 imposing the anti-dumping duties on imports of biodiesel originating from these countries, thus the taxation ranged from 6.8% to 10.6% on Argentinian biodiesel and from 0% to 9.6% on Indonesian respectively (GAIN, 2016). As a result, imports from both countries have fallen considerably in 2013 and almost ceased in 2014. The market gap was partially filled with domestic EU production and the rest covered by Malaysia, South Korea, India, and Brazil.

2.3. Constraints

Biodiesel imports are constrained by the sustainability requirements laid down in the Renewable Energy Directive: since 2013, all biofuels must achieve greenhouse gas savings of at least 35 percent. Russian Biofuels & Co will be using rapeseed oil as a feedstock, which has 38% default GHG savings (App. Figure 5) and therefore satisfies this constraint.

Another challenge is the increasing production capacity of biodiesel using hydrogenated vegetable oils (waste oils and fats) in the EU. In 2015, HVO production was estimated at 2.3 billion litres and predicted to grow to 2.9 billion litres in 2017 (GAIN, 2016).

Moreover, SWOT analysis has been performed in order to fully identify the internal and external factors affecting the business. Please refer to Appendices, Figure 6.

3. Products

3.1. Biodiesel

Biodiesel is a fatty acid methyl ester produced from agricultural feedstock, such as vegetable oil (most common feedstock today), animal fat and recycled cooking oil (App. Figure 7). Biodiesel produced from rapeseed is the most suitable for cold weather countries such as Sweden (App. Figure 8) (Bornstein and Bowen.). Our selling product will be Biodiesel B100 which is pure Biodiesel. It can substitute petroleum diesel, or more frequently it is mixed with it in different proportions according to the type of engine where it will be used.

In contrast to ethanol prices which are closely related to crude oil prices, biodiesel prices are closely linked to the vegetable oil prices. Today, Biodiesel selling prices in Germany who is the main EU producer and main competitor are around USD 880 / mt (App.Figure 9). Price in Argentina is around USD 770 / mt but its subject a 10.6% of anti-dumping tax. In order to be competitive, we have estimated a CFR Sweden port price of USD 859 / mt, which ensures competitiveness, profitability, and prevents us from dumping risk.

According to OECD (2016), World biodiesel prices expressed in nominal terms are expected to increase 22% by 2025 (App. Figure 1)

Production process

The production of this fuel starts with grinding rapeseed seeds and extracting oil. At proper settings, the plant's machine can pull out about 40% to 55% of the seed weight in oil (Clemow, 2013). Then it's moved to the storage tank before passing through a vertical-leaf filter. The filter screens the oil

and removes sediments that might be presented in the mixture. Lastly, the processor converts the filtered oil into raw biodiesel. To convert the oil into biodiesel, oil is mixed with methanol and a base catalyst, usually sodium or potassium hydroxide. After the removal of the production by-product glycerol, the resulting biodiesel can be used in most diesel engines, without the need for engine modification. According to Graboski and McCormick (1998), biodiesel tends to give similar engine performance as conventional diesel fuel while reducing emissions of particles, hydrocarbons and carbon monoxide.

Plant Specifications

Investment in the plant consist mainly of:

1. A number of tanks where the raw materials, final product and sub-products will be stored, as well as some crucial facilities required for the proper operation of the plant, for example grain silos.
2. Screw presses that squeeze oil from rapeseeds. They have a production capacity of one tone per hour and are fully automatized.
3. A cooling tower system, a steam generation system, air and electrical distribution systems and other biodiesel processing equipment will be installed.
4. Railroad trucks will be laid down to connect the plant to the main rail network.
5. A wastewater treatment facility will also be put in place maintaining our commitment with sustainable production

The plant has a maximum production capacity of 60 million litres of Biodiesel B100. We assume production will begin at 38 million litres, with the intention of increasing volume once the business is fully established. In order to reach this base production level, 95,000 tonnes of rapeseed are required. Biodiesel will be produced by the “Dr Pepper” method: one litre of rapeseed oil, 0.2 litre of methanol and seven grams of potassium hydroxide will yield one litre of biodiesel. Figure 10 of the appendix presents the scheme of the production cycle.

Finally, the plant will require a stable supply of natural gas and electricity, and will be operating 24/7, 350 days per year. To meet the objective three working shifts will be employed (8 hours each).

Raw Material

Rapeseed is the main input for the production process, representing approx. 90% of the total annual costs. Prices in Russia range from ₽19,000 (USD 334) to ₽26,000 (USD 457) per ton (agroserver.ru). However, we will endeavour to communicate with local farmers and negotiate preferential prices for large volumes and term supply contracts. For this reason, reference price used in the financial statements is USD 334/mt.

Bloomberg reports current prices for rapeseeds in Western Europe of around €412 (App. Figure 11). However May 2019 future contracts trade at €370 (App. Figure 12), indicating a backwardation market. This could lead to price reductions on main European markets including Russia, hence reducing the company's cost of sales.

As for another input feedstock – methanol, its prices is estimated to be around ₽17,000 ($299) with the delivery being done via railway service. The price of catalyst - potassium hydroxide currently stands at $700.

3.2. By-Products

Glycerol

Volume of glycerol produced typically yields 10% of the total biodiesel volume produced. It is essentially an alcohol, known as Hygroscopic, which physical and chemical properties make it suitable to be used as a feedstock in many industries as summarized in Figure 13 of the Appendix. Major end use industries such as pharmaceuticals and foods & beverages are sustaining the demand for this product, which is anticipated to grow. In 2016 Europe consumed 800 kilo tons of it (App. Figure 14). As for the market share is it estimated to exceed $ 3 billion by 2022, thus growing by 7.9% since 2015 (GBM, 2016).

Considering the magnitude of Russian industrial market we will sell glycerol internally, particularly in Moscow area which is the most demanding. Glycerol prices differ depending on it pureness. The five years average price in Europe has been considered as a reference (App. Figure 15), with a discount for selling a less pure product (90%) in local market. Reference price is USD 318 / ton delivered in Moscow.

Rapeseed meal

During the production process rapeseed meal will be obtained from the Cold Press, which can be used to feed animals (livestock). The primary market for this product is also Moscow area where the livestock industry is located. Kazan and Novosibirsk are another perspective markets (App. Figure 16). With animal farms being the key consumers of press cake, the current state of the meat production industry was consulted. The volume of meat produced is expected to reach 330 million tons in 2021, a 6.7% increase from 2016 (App. Figure 17). Based on the last year average price of Rapeseed Meal of USD 204/mt (App. Figure 18) we have assumed a price of USD 218/mt, delivered in Moscow area.

4. Location

Russian Federation is a country in Eurasia. It has a population of 143.4 million inhabitants and a GDP per capita of $9,243. Russia is one of the biggest exporter of biofuels in the world. Yet,

bioenergy sector is undeveloped. The availability of arable land, which is the biggest in the world (App. Figure 19) and biomass resources, creates favourable conditions for biofuels and biodiesel in particular. Today, Republic of Chuvashia and Republic of Tatarstan are the leading producers of biofuels in Russia.

The plant is planned to be constructed in Saint-Petersburg area due to well-developed transportation infrastructure network: port of Primorsk, railway link and close location to Europe, which is presumed to be the main importer of biodiesel.

The total harvest of rapeseed in Russia in 2016 was 1,074.4 thousand tons of canola (Russian Ministry of Agriculture, 2016). Potential regions where the rapeseeds will be bought are the top two production areas: Tula region with the harvest of 74.8 thousand tons or Kemerovo region with the yield of 71.9 thousand tons in 2016 (App. Figure 20).

4.1. Transportation costs

Russian Biofuels is willing to deliver the production on CFR basis for which transportation costs have been included. The most efficient way to transport biodiesel to Western EU and Sweden is by ship.

A rate-per-ton-charter contract will be signed with one projected voyage each month from St. Petersburg, Russia to Port of Gothenburg, Sweden (App. Figure 21). The trading route lies in the “SECA” zone of the Baltic Sea, hence, the ship must be bunkered with marine gasoil instead of heavy fuel oil. However, the charterer, Russian Biofuels & Co in this case, is not responsible for the bunker with the rate-per-ton option.

To transport biodiesel from the production site to the port area, train services will be used. Freight rate is estimated to be $0.225/km (50 km in total). By-products will also be transported by train, with the final destination being Moscow (App. Figure 22, Figure 23). Total transportation costs can be found in Figure 24 of the appendix.

5. Corporate structure and Financing

Russian Biofuels & Co is a company incorporated in the Russian Federation. It is a 100% subsidiary of CASS Plc, a company duly registered in the UK and operating under the English law. Russian Biofuels & Co. The whole team, apart from the production manager and operators that will work directly on the production site, will be in the main office based in Saint Petersburg. CFO, Sales Manager, and Production Manager respond directly to CEO who is accountable to CASS Plc’s board of directors. Corporate structure is presented in Figure 25 of the appendix.

5.1. Capital Structure and Initial investment

Total investment will be USD 17,500,000 and will be funded entirely with CASS Plc funds for three main reasons. First, the willingness of CASS Plc to increase its operations in Russia's promising energy sector. Second, the borrowing rate in Russian Federation is quite high. Finally, Russia Biofuels & Co desires to keep the full control of the company's operations, which might not be achievable due to possible covenants if a loan is taken.

5.2. Cost of Capital estimation

Cost of capital was computed using the CAPM equation:

$$CoC = rf + \beta * (rm - rf - CRP)$$

- Risk free rate is the average of UK government's 10-year bonds issued in the last 10 years. This rate was 2.851 % (Bloomberg, March 2017)
- Return on the market was estimated as the average return of FTSE 100 over the last 10 years. This rate was 5.94% (ibid)
- Company's β was estimated as the average unlevered β of 10 companies operating in the biofuels sector (more than 50% of their revenue from this origin). Average β = 0.39 (App. Figure 26).
- A country risk premium has been included to contemplate the higher risk of the Russian Federation in comparison to main companies of companies used as benchmark. CRP = 8.239% (ibid)

$$CoC = 2.85\% + 0.39 * (5.94\% - 2.85\% + 8.23\%) = \mathbf{7.26}\%$$

5.1. Financial Evaluation and Ratio Analysis

Investment Decision Criteria

To analyse the viability of the project we computed the Internal Rate of Return (IRR), Net Present Value (NPV) and Payback Period, using discounted cash flows.

We have considered three scenarios with different production levels:
Scenario (1) assumes a constant production volume for the whole economic life of the plant. Scenario (3) assumes the plant will work at the maximum capacity from the beginning of the project. Eventually, it may require additional installation of equipment as well as no delays or breakdowns to occur. Finally, scenario (2) reflects an intermediate situation. Please refer to Figure 1 of the Appendices for a summary of the assumptions.

To derive the expected NPV and IRR of our project we have allocated probabilities for our pessimistic, moderate and optimistic production levels. These are 25%, 50% and 25%, accordingly. The computed expected value of $ 23,795,612 indicates that the project is profitable and worth undertaking.

As for IRR, here we have come across an IRR pitfall. A double sign change in the cash flows reduces the validity IRR evaluation method. Nevertheless, having put the implication aside, we have calculated the expected IRR, using the same weights. A value of 25% signposts that the rate of return of the project exceeds the company's cost of capital by 17.74%.

The Payback Period of this investment depends on the level of output. The longest payback period is 6 years and 10 months; the fastest is 2 years and 3 months. The expected payback period for this project stands at 3 years and 3 months, which is quite good for the project of such scale. Thus, one may conclude that the undertaken evaluation has proved the project to be profitable with high potential to generate cash.

Ratios Analysis

Return on Equity (RoE) measures earnings performance. Generally, a return of equity of 15-20% is considered to be a good result. Russian Biofuels & Co expected RoE is 35%. Again, it confirms the profitability of this business. However, the RoE benchmark will differ among industries and even countries. Return on capital employed (RoCe), which is a financial ration that measures the efficiency with which the capital is exploited, is 44%.

We have also considered Assets Turnover ratio, which is an essential indicator of how effective the assets are utilised to generate revenues. In our case our assets are predominantly tangible, thus it is crucial for us to deploy assets efficiently. The expected ratio equals to 104%.

Finally, we have computed a Profit Margin ratio, which is 9.6%. It implies that Russian Biofuel & Co have a net income of $0.096 for each dollar of total revenue earned. Ideally, this number should be improved. In order to achieve a greater result, the net profit figure must be increased, for instance by reducing cost of sales.

Main results are summarized in the following table:

	Investment Decsision Critereia			Ratios			
	Probability	NPV	IRR	RoE	RoCe	Assets Turnover	Profit Margin
Pessimistic	25%	4,360,593	7%	25%	31%	121%	9.5%
Moderate	50%	28,705,217	27%	38%	48%	94%	9.7%
Optimistic	25%	33,411,420	38%	40%	50%	107%	9.7%
Expected		**23,795,612**	**25%**	**35%**	**44%**	**104%**	**9.6%**

6. Insurance and Tax

6.1. Insurance

Grain operation, production, transportation and storage of biofuels, involves several risks that need to be mitigated. Main policies for that purpose will include:

- *General liability* covers the business in the case of claims arising from injuries, accidents, or negligence.
- *Property insurance* typically covers losses caused by fires, lightning strikes, hail, windstorms, explosions, theft, vandalism, etc.
- *Workers' compensation insurance* protects employees and company from injuries at work.
- *Business income insurance* covers unexpected events that may temporarily interrupt operations.
- *Land cargo insurance* covers the land transportations by trucks and other utility vehicles.
- *Marine cargo insurance* covers transportation carried out by sea or by air from damage due to cargo loading/unloading, weather contingencies, piracies and other relevant issues.

6.1. Tax

Local Taxation

Route of Trading: Russia local taxation – Export tax – European Country

- *Corporate tax, Including Capital Gains Tax, Valued Added Tax (VAT):* The standard rate of tax is currently of 20% of which of 2% of it is normally paid to the federal budget and 18 % to the budgets of constitute entities of Russian Federation.
- *Regional Tax:* Resident enterprises and foreign companies that own property within the territory of the Russian Federation are liable to property tax (maximum 2.2%).
- *Local Tax:* Land tax is payable at a rate of 0.3% on agricultural and residential land and 1.5% on other types of land. (Anon, 2017)

Import taxes to European countries:

When importing goods from outside the European Union (EU), import duties apply. Also VAT and in some cases excise duty, third party tax, consumption tax and others.

Import declaration: Goods that enter the customs territory of the EU from a non-EU country are referred to as 'non-Community goods'. Before these goods can be marketed within the EU, they should first be released into free circulation. It is seller's responsibility to pay the third party tax, which is about 6.5%. (Taxation and customs union, 2017) (Duty Calculator, 2017). A reduced duty or zero duty may be temporarily applied to the imports of certain raw materials and semi-finished products that are in short supply in the EU but this can't be determined beforehand.

Total tax rate:

- 20% (Corporate Tax)
- 2.2% (Region Tax): value of the property x 2.2%
- 1.5% (Local Tax): value of the land x 1.5%
- 6.5% (Third Country Part Tax): Value of the product we are going to import to European country x 6.5%, its included in the cost of sales.

7. Risk Factors

Country Risk

The main risks identified by Coface for the Russian Federation are the increased rentier nature of the economy, a weak private banking sector, weak infrastructure aggravated by very low level of investment, declining demographics, and persistent deficiencies in the business climate ("Russian Federation / Economic Studies - Coface"). Additionally, after 2014th conflict with Ukraine, sanctions have been imposed by the EU and the US on Russia, which in part contributed to the collapse of the Russian rubble. As of today, Minsk agreements have not been fulfilled, which lead to the sanctions extension until July 2017 (Consilium.europa.eu, 2017). Conducting the proper due diligence, we believe these sanctions won't affect the production or export of biodiesel.

Currency risk

Although the main trading flow will be with Sweden, which despite being an EU member has its own currency – Swedish Krona, foreign sales will be paid in US Dollars being an accepted international currency. There is a risk of Russian rubble to appreciate, hence leading to an increase in cost of sales because most of our expenses are incurred on the territory of Russia.

This risk associated with fluctuations of the currency exchange rate will be eliminated through hedging. The derivatives available to the company are futures, swaps and options available on FOREX. The exchange rates will be regularly evaluated and depending on the state of the currency appropriate actions will be taken.

Credit Risk

Counterparty risk, especially if the market is characterised by monopsony can lead to financial distress in case the customer fails to meet their obligations. To avoid this, Russia Biofuels & Co will endeavour to attain letters of credit, standby letters of credit and credit insurance whenever possible.

Market Risk

Lunkova (2010) notes that although biotechnology has started capturing attention in Russia, it still lacks a strong biofuel strategy. She adds that the current legal framework constrains the use of this source locally and that a strong and effective energy policy must be urgently accepted. There is a

strong tendency of regional biofuel production to be export oriented due to the barriers discussed earlier. Evidence suggests that only few regions, e.g. Novgorod and Leningrad regions have created local programs for biofuel use.

Risks associated with the security of feedstock supply are of significant importance, for example adverse weather conditions affecting the harvest for prolonged periods. For this reason the company will be using rapeseed as feedstock because “rapeseed is the most suitable oil crop for the Russian climate for biodiesel production”, - Lunkova (2010) says.
On the demand side main risks are related to the changes in prices of competing fuels, the presence of subsidies from the EU to protect local biofuels production, and more severe sanctions against Russian exports.

Operational Risk

The institute of Chemical Engineers has identified certain process risks associated with the biofuel projects. According to the ICHEM, great attention is paid to financial and environmental risk whereas the risks on production are not well understood and dealt with. Hazards such as fire, explosion and overpressure releases, runaway/uncontrolled reaction, toxic and steam flashes are the biggest risks (ICHM, 2011).

8. Exit Strategy

Depending on the circumstances our company may implement certain strategies in order to further develop our business, or abandon it. Some of the possible actions include:

1. *Leverage the company.* By doing so, the company may enjoy the benefits of the tax shield. However, that may lead to forgoing some of the independency in decision making process.
2. *Go public.* Initial public offering is the process by which the company sales its shares to the general public. Eventually, the enterprise transforms from privately held to the public one. The primary goal of it is to raise capital to fund investments and increase liquidity. In addition, capital markets are believed to be an essential part of company’s strategy to provide growth opportunities as well as boost performance. Moreover, IPO’s offer an alternative to raising cash through issuing debt obligations.
3. *Merger & Acquisition.* This implies that Russian Biofuels & Co will either join a competitor to form an alliance or buy the rivalry firm. This strategy may be implemented to benefit from new market share or acquiring some R&D innovations and patented ideas. However, this strategy is considered to be risky, hence a proper due diligence should be undertaken.
4. Sell the company to the interested investors.
5. If things go extremely bad, one may opt to file for bankruptcy, which eventually will lead to entity liquidation.

9. References

Bornstein, Joseph, and Curt Bowen. *BIODIESEL: Producción Y Aplicaciones*. 1st ed. Whitman Direct Action. Web. 1 Apr. 2017.

Businessinsider.com (2017). *Rapeseed price in Euro. Markets Insider.* [Online] Available from: http://markets.businessinsider.com/commodities/rapeseed-price/EURO [Accessed 11 March 2017]

Coface.com (2017). *Russian Federation: Economic Studies - Coface.* [Online] Available from: http://www.coface.com/Economic-Studies-and-Country-Risks/Russian-Federation [Accessed 14 March 2017]

Consilium (2017). *Russia: EU prolongs economic sanctions by six months.* [Online] Available from: http://www.consilium.europa.eu/en/press/press-releases/2016/12/19-sanctions-russia/ [Accessed 13 March 2017]

Culshaw F., Butler C. (1992). A review of the potential for biodiesel as a transport fuel. *ETSU-R-71 publication*, HMSO, London.

DutyCalculator (2017). *Import duty and taxes explained in a nutshell - DutyCalculator Help Centre.* [Online] Available from: https://www.dutycalculator.com/help_center/Import-duty-and-taxes-explained-in-a-nutshell/ [Accessed 15 March 2017]

Dworakowska, S., Bednarz, S. and Bogdal, D. (2017). *Production of biodiesel from rapeseed oil.* [Online] Available from: https://sciforum.net/conference/wsf/paper/631/download/pdf [Accessed 13 March 2017]

Eia.gov (2017). *International Energy Outlook 2016-World energy demand and economic outlook - Energy Information Administration.* [Online] Available from: https://www.eia.gov/outlooks/ieo/world.cfm [Accessed 11 March 2017]

European Biodiesel Board (2016). *Statistics.* [Online] Available from: http://www.ebb-eu.org/stats.php [Accessed 13 February 2017]

European Union (2009). Directive 2009/28/EC of the European Parliament and of the Council of 23rd April 2009 of the promotion of the use of energy from renewable sources and amending and subsequently repealing directives 2001/77/EC and 2003/30/EC. *Official Journal of the European Union.*

FAO investment centre (2014). *Russian Federation: Meat sector review.* [Online] Available from: http://www.fao.org/3/a-i3533e.pdf [Accessed 18 March 2017]

Fas.usda.gov (2017). *Russia: Livestock and Products Annual; USDA Foreign Agricultural Service.* [Online] Available from: https://www.fas.usda.gov/data/russia-livestock-and-products-annual-0 [Accessed 12 March 2017]

Global Agricultural Information Network (2016). *EU Biofuels Annual 2016.*

[Online] Available from: http://dx.doi.org/10.1787/agr-data-en [Accessed 2 February 2017]

Global Market Insights (2017). *Glycerol Market size worth $3.04bn by 2022.* [Online] Available from: https://www.gminsights.com/pressrelease/glycerol-market [Accessed 14 February 2017].

Graboski, M.S., McCormick, R.L. (1998). *Combustion of fat and vegetable oil and derived fuels in diesel engines*. Prog. Energy Combust. Sci. 24, 125-164.

Gray, R. (2016). Russian Federation Oilseeds and Products Annual 2016. [Online] Available from: https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Oilseeds%20and%20Products%20Annual_Moscow_Russian%20Federation_3-21-2016.pdf [Accessed 15 March 2017]

Grubinger, V. (2007). *On-farm oil seed production and processing.* [Online] Available from: https://www.uvm.edu/pss/vtcrops/articles/EnergyCrops/Oilseed_Final_Report_5-15-2007.pdf [Accessed 11 March 2017]

Nair, S. (2011). *Identifying and managing process risks related to biofuel projects and plants.* [Online] Available from: http://www.icheme.org/~/media/Documents/Subject%20Groups/Safety_Loss_Prevention/Hazards%20Archive/XXII/XXII-Paper-49.pdf [Accessed 01 March 2017]

Nationwide.com (2017). *Insurance for your biofuel company from nationwide.* [Online] Available from: https://www.nationwide.com/biofuels.jsp [Accessed 10 March 2017]

PKF (2016). *Russia: tax guide 2015-16.* [Online] Available from: http://www.pkf.com/media/10026040/russia-tax-guide-2015-16.pdf [Accessed 29 March 2017]

Prensa, D. (2017). *Bioenergy information.* [Online] Available from: http://www.agroindustria.gob.ar/sitio/areas/bioenergia/informes/ [Accessed 17 March 2017]

Rufil consulting (2017). *VAT refund in Russia.* [Online] Available from: http://rufil-consulting.com/services/accounting-taxes/vat-refund-russia/ [Accessed 5 March 2017]

SRUC (2017). *Blue prints for profitable farm production in post-CAP-reform Scotland.* [Online] Available from: https://www.sruc.ac.uk [Accessed 17 March 2017]

Taxation and customs union (2017). *Calculation of customs duties - taxation and customs union - European Commission.* [Online] Available from: http://ec.europa.eu/taxation_customs/business/calculation-customs-duties_en [Accessed 21 March 2017]

Transparencymarketresearch.com (2013). *Glycerol market - global industry analysis, size, growth and forecast 2012-2018.* [Online] Available from: http://www.transparencymarketresearch.com/glycerol.market.html [Accessed 13 March 2017]

Tyson, K., Bozell, J., Wallace, R., Petersen, E. and Moens, L. (2004). *Biomass oil analysis: research needs and recommendations.* [Online] Available from: http://www.nrel.gov/docs/fy04osti/34796.pdf [Accessed 02 March 2017]

10. Appendices

Main Assumptions of the project

1. Lower cost of Raw Material in the local market than commodity price because of the proximity to the rapeseed production area.

2. Due to “cold press” extraction process, the production yield of rapeseed flower is 56% rapeseed meal, 40% rapeseed oil and 4% residues.

3. The biodiesel production process is “Dr. Pepper” Method.

4. The plat will develop three different level of production: 38 million litters, 49 million litters and 60 million litters.

5. Glycerol production is equal to the 10% of the total Biodiesel produced, which level of pureness will be 80%.

6. The plant is working 24 hours, 7 days per week, 350 days per year.

7. The depreciation of the plant is calculated in 15 years.

8. Biodiesel is going to be sold in EU, mainly Sweden market and the final price is based in the Incoterm Cost & Freight (CFR) for which transport costs have been included.

9. Glycerol and Rapeseed meal are going to be sold to local industry located in Moscow area.

10. Biodiesel prices take into account the German sale prices to the market less a discount with a value around the 4%.

11. The production is send every two months to our external customers.

12. The sales are cashed in two months and the costs are paid in 1 month.

13. Insure equals to 10% of the CAPEX.

14. Inflation doesn’t affect sales and raw material prices for being goods tradeable in international commodities markets. Expenses will increase in line with Russian projected inflation rate of 5%.

Figure 1 – World Biofuels projections

		Average 2013-15est	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
BIODIESEL												
World												
Production	mln L	31.1	33.2	34.5	35.3	36.7	37.9	38.8	39.6	40.2	40.8	41.4
of which vegetable oil based	mln L	25.2	26.3	26.6	26.9	27.5	28.4	29.0	29.3	29.5	29.8	30.1
of which waste based	mln L	2.4	2.9	3.4	3.7	4.2	4.4	4.7	5.1	5.4	5.8	6.0
of which biomass based	mln L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Consumption	mln L	30.3	33.5	34.7	35.5	36.9	38.1	39.0	39.8	40.4	41.0	41.6
Exports	mln L	4.0	2.2	2.6	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.6
Price[3]	USD/t	93.9	72.1	71.9	73.7	76.8	81.5	85.9	87.3	87.1	88.4	88.4
Developed countries												
Production	mln L	18.1	19.4	19.9	20.3	21.1	21.7	22.0	22.3	22.4	22.4	22.4
Consumption	mln L	19.9	20.7	21.5	22.0	22.9	23.4	23.7	24.0	24.0	24.1	24.1
Net trade	mln L	-1.8	-1.3	-1.6	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Developing countries												
Production	mln L	13.0	13.9	14.6	15.0	15.5	16.3	16.8	17.3	17.8	18.4	18.9
Consumption	mln L	10.4	12.7	13.2	13.5	14.0	14.7	15.3	15.8	16.4	16.9	17.5
Net trade	mln L	2.6	1.1	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4
OECD[2]												
Production	mln L	18.7	20.1	20.7	21.1	22.0	22.5	22.9	23.1	23.2	23.3	23.3
Consumption	mln L	20.3	21.3	22.2	22.7	23.5	24.1	24.5	24.7	24.8	24.8	24.8
Net trade	mln L	-1.7	-1.2	-1.5	-1.6	-1.6	-1.6	-1.6	-1.6	-1.5	-1.5	-1.5

Source: OECD/FAO (2016)

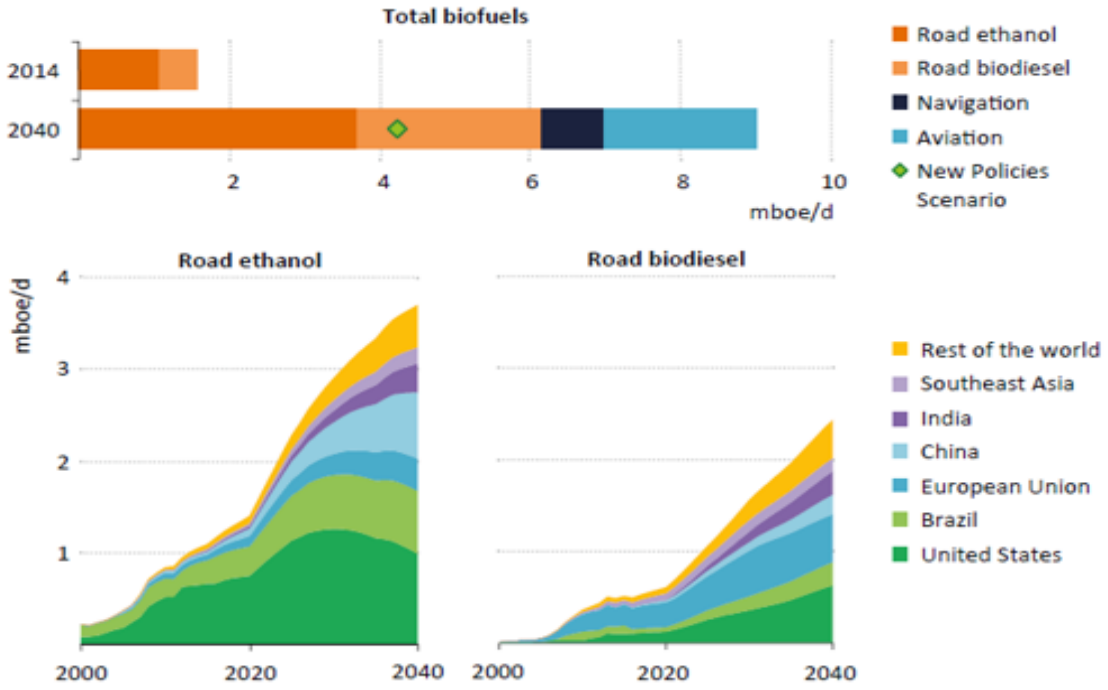
Figure 2

Table 7. Biodiesel & Renewable Diesel (HVO) (Million Liters)								
Calendar Year	2010	2011	2012[r]	2013[r]	2014[r]	2015[e]	2016[f]	2017[f]
Beginning Stocks	807	528	562	820	534	550	555	560
Production	10,707	11,041	11,082	11,983	13,341	13,535	13,680	14,155
>of which HVO production	430	467	933	1,531	2,388	2,356	2,558	2,865
Imports	2,400	3,164	3,293	1,393	632	538	530	545
Exports	117	100	116	416	183	243	320	260
Consumption	13,268	14,070	14,001	13,246	13,774	13,825	13,890	14,430
Ending Stocks	528	562	820	534	550	555	555	565

Figure 3

Table 10. EU Biodiesel/HVO Consumption Main Consumers (million liters)								
Calendar Year	2010	2011	2012	2013	2014	2015[e]	2016[f]	2017[f]
France	2,579	2,624	2,914	2,971	3,232	3,249	3,270	3,290
Germany	2,933	2,756	2,816	2,513	2,630	2,442	2,390	2,270
Italy	1,670	1,654	1,623	1,517	1,313	1,320	1,320	1,320
United Kingdom	966	1,034	636	977	954	909	910	1,020
Sweden	784	289	415	569	682	852	910	970
Spain	1,553	1,830	1,677	700	679	762	765	810
Poland	541	1,079	837	843	730	738	740	740
Austria	602	576	567	575	702	704	710	710
Portugal	219	395	358	352	373	381	390	470
Netherlands	423	222	270	250	317	341	360	400
Denmark	209	106	286	286	329	341	340	340
Others	1,596	1,436	848	2,222	1,855	1,860	1,860	1,940
Total	14,075	14,001	13,247	13,775	13,796	13,899	13,965	14,280

Figure 4



Source: IEA WEO (2016)

Figure 5

	Typical GHG[1] savings	Default GHG[2] savings
Rape seed biodiesel	45%	38%
Soy bean biodiesel	40%	31%
Sun flower biodiesel	58%	51%
Palm oil biodiesel (Process not specified)	36%	19%
Palm oil biodiesel (process with methane capture at mill)	62%	56%
Corn ethanol, Community produced (natural gas as process fuel in CHP plant)	56%	49%
Sugar beet ethanol	61%	52%
Sugar cane ethanol	71%	71%
Waste vegetable or animal oil biodiesel	88%	83%

Figure 6 - SWOT Analysis

INTERNAL FACTORS	
STRENGTHS (+)	WEAKNESSES (-)
• High Yield in the production of rapeseed oil in comparison with other vegetable oils. • Rapeseed Biodiesel has the best features for working in cold weather conditions. • Proximity to rapesees producer area in Russia. • Local costumers for glycerol and rapeseed meal which imply low cost of transportation.	• Non previous experience in the Biofuel Industry. • Non previous commercial experience Russia. • Biodiesel needs to be mixed with Fossil Diesel.

EXTERNAL FACTORS	
OPPORTUNITIES (+)	THREATS (-)
• The increase in the European Union Biofuel Demand. • EU policies about the Climate Change and creation of the "Renewable Energy Directive". • Competitors are selling at very low prices but they are supporting anti-dumping. • Sweeden is the biggest biodiesel importer in EU. • Biodiesel prices are linked with vegetable oil prices.	• Four of the largest country producers in the production of biodiesel belong to the EU • High inflaction rate in the Russian market. • Argentine Biodiesel has the lowest price in the global market. • Worsening in Russian business climate

Figure 7

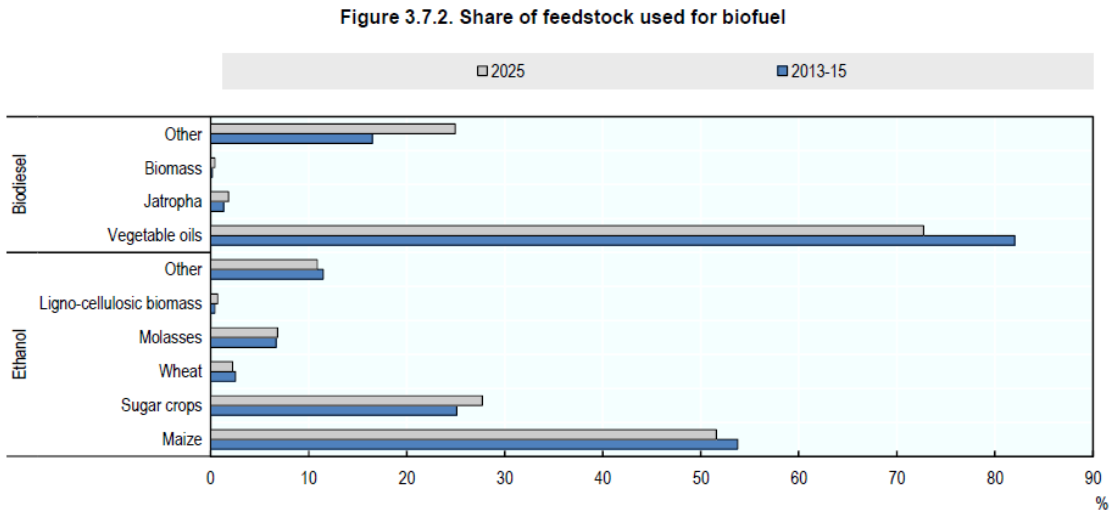


Figure 8

BIODIESEL OPERABILITY AT LOW TEMPERATURES			
B100 Derived from:	Cloudy Point °C	Gelatin Point °C	Cold Filter Point °C
Soya oil	2	-1	-2
Rape Oil	-3	-4	-4
Butter	14	11	11
Cooking Oil	42	12	11
Coconout Oil	7	6	6
Palm Oil	13	12	11
Pinion	7	6	6

Source: Dunn (2005)

Figure 9 - German Biodiesel Prices vs EU average price

Figure 10

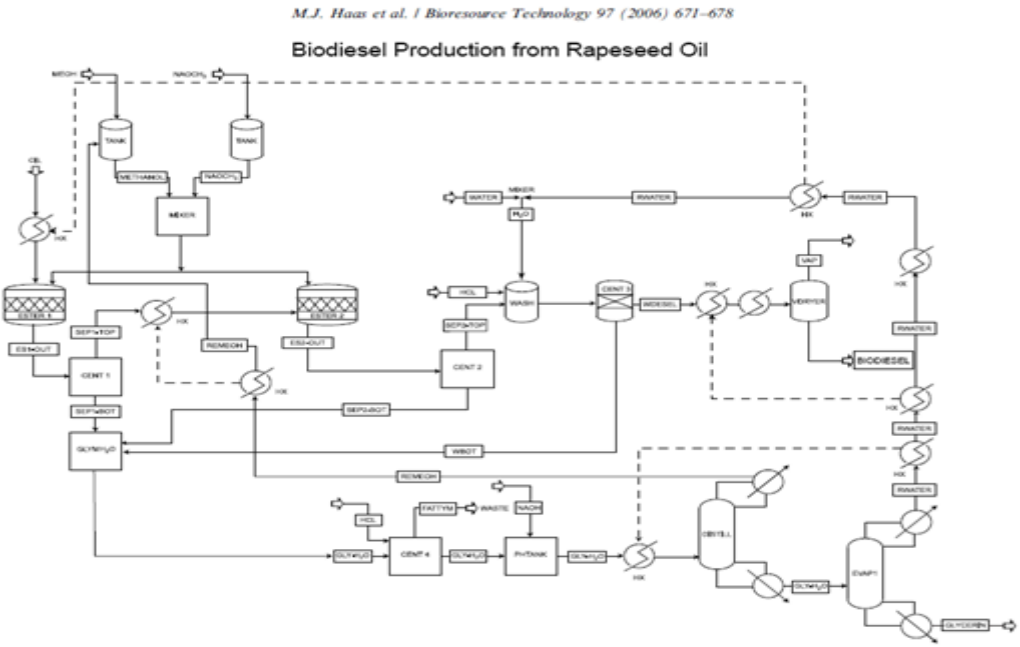


Figure 11

Figure 12

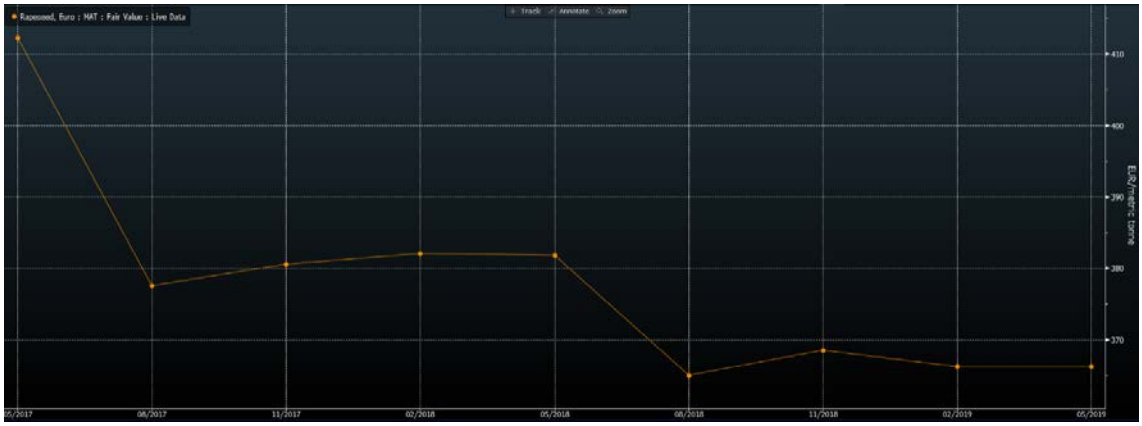


Figure 13

Figure 14

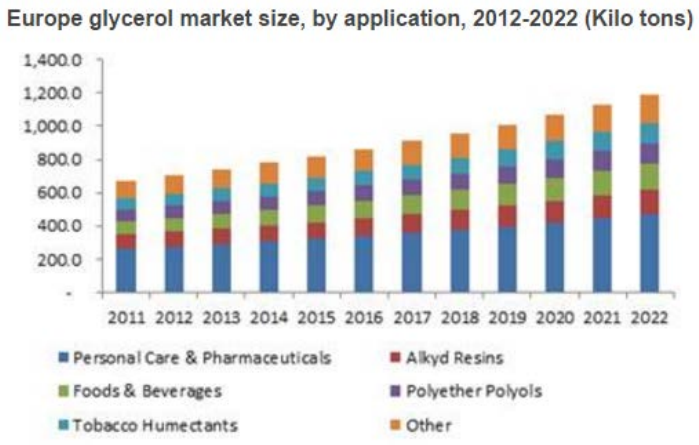


Figure 15

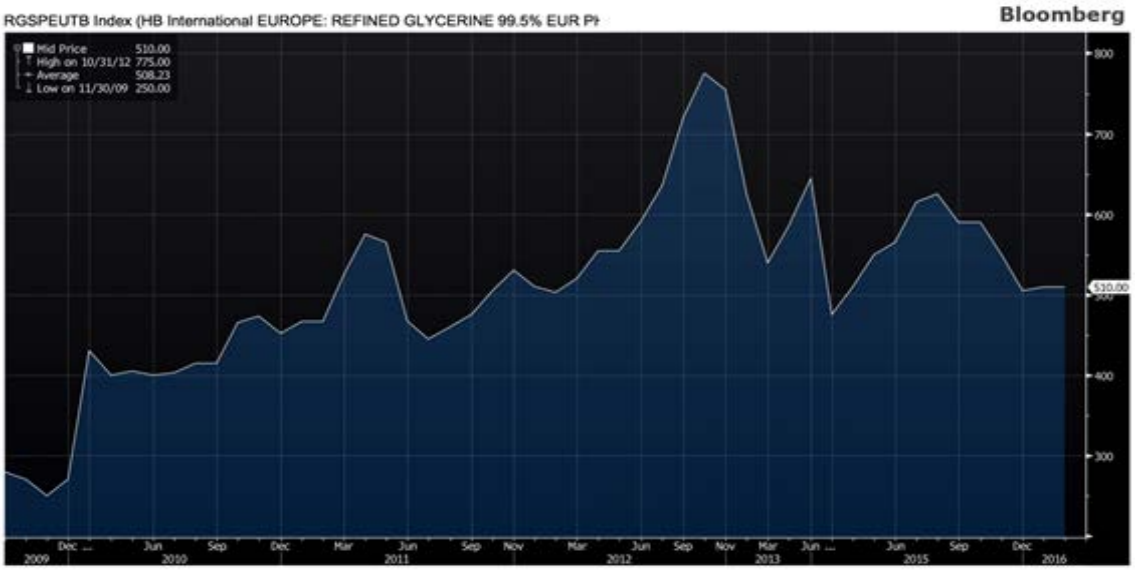


Figure 16

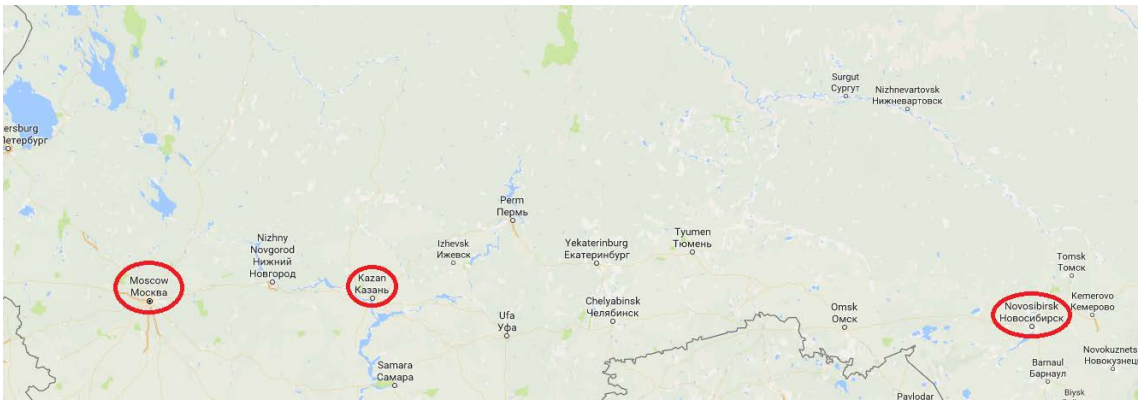


Figure 17

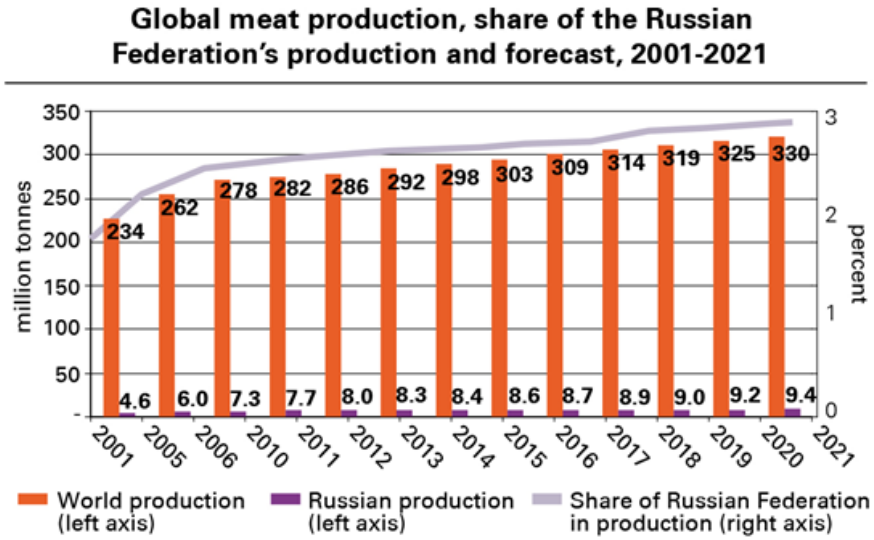


Figure 18

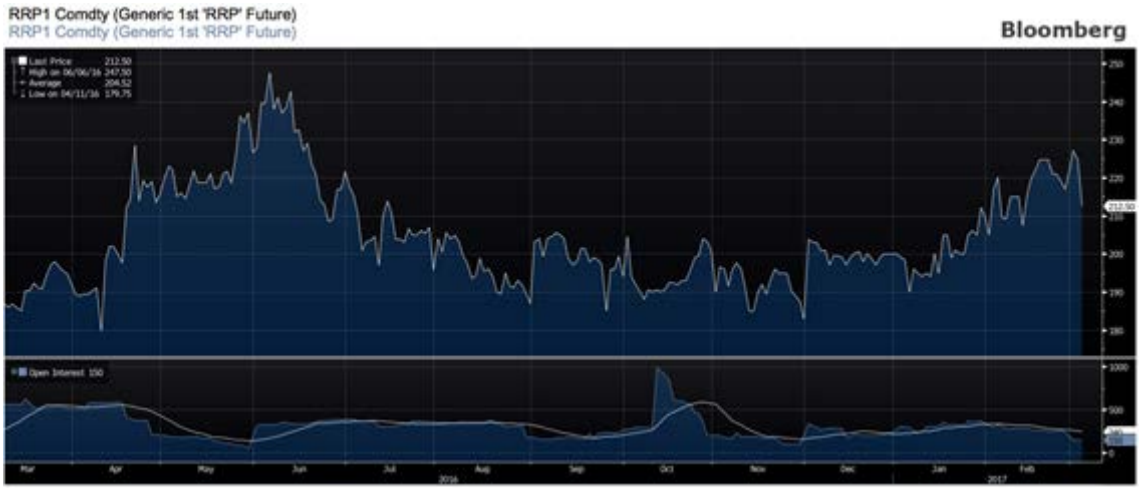


Figure 19

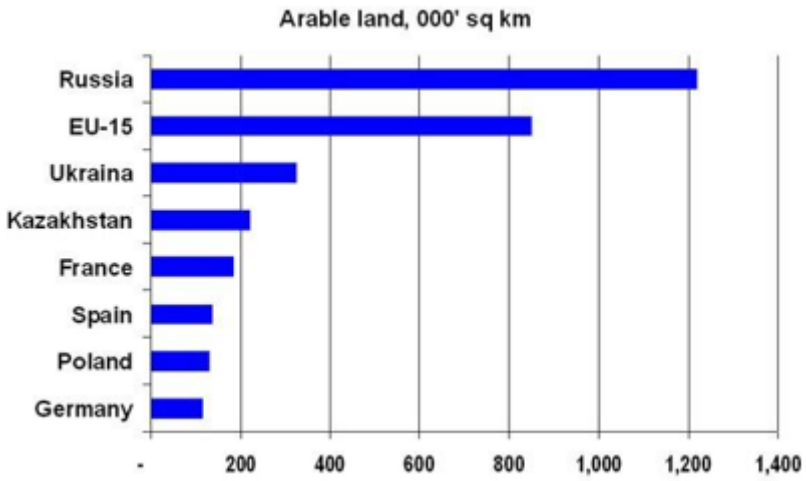
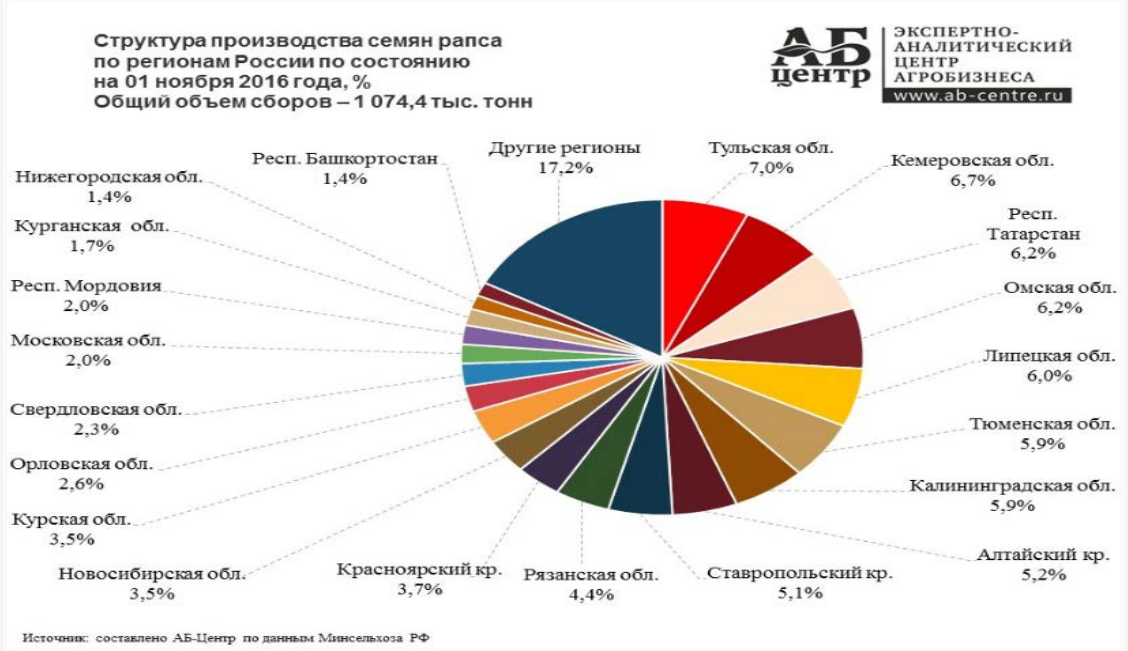


Figure 20 – Rapeseed harvest per region, 2016



Source: Analytical Centre of Agricultural Business

Figure 21

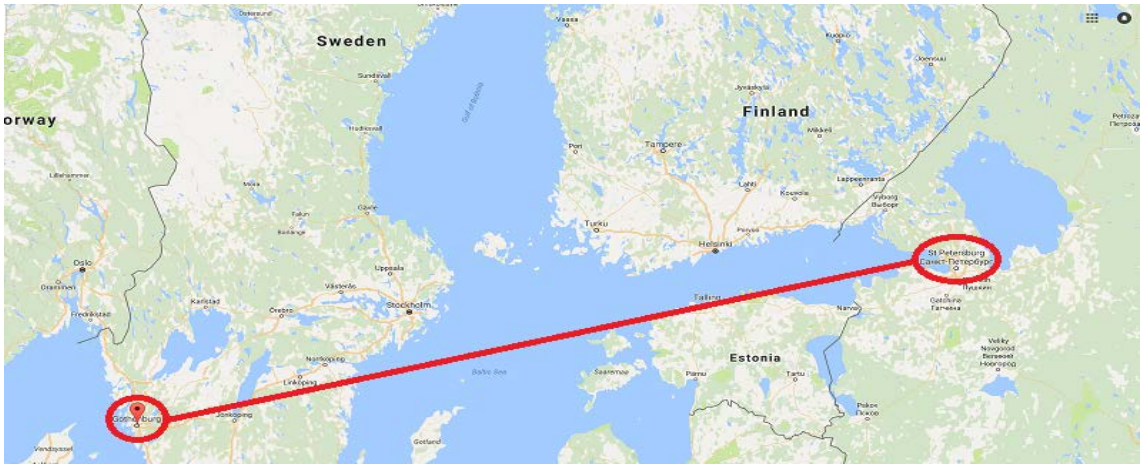


Figure 22

TRANSPORTATION CONSTANT COSTS			$/ton	
Bunkers	$	12,500.00	$	2.78
Pilotage	$	3,000.00	$	0.67
D/A	$	7,000.00	$	1.56
Insurance	$	2,000.00	$	0.44
TOTAL	$	24,500.00	$	5.44

Figure 23

Constants		
Glycerol	316.7	tons
Rapeseed meal	4750	tons
Train cost	$0.025	Per km/ton
Vessel Fuel Consumption (tons)	10	tons
Voyage duration(inc. load/disch)	5	days
Marine Gas Oil	$250.00	per ton

Figure 24

TRAIN TRANSPORTATION COSTS		Distance (km)	Cost ($)
Biodiesel BAD	Plant - St. Petersburg Port	50	$ 3,959
Biodiesel MEDIUM			$ 5,104
Biodiesel GOOD			$ 6,250
Glycerol	Plant - Moscow	700	$ 5,542
Rapeseed meal	Plant - Moscow	700	$ 83,125

	BAD SCENARIO	MEDIUM SCENARIO	GOOD SCENARIO
Plant production	3167.00	4083.00	5000.00
Carried twice per month(tons)	6334.00	8166.00	10000.00
Vessel size	7000	9000	12000
Rate-per-ton	$ 1.11	1.1021	1.200
Total Rate-per-ton charter	$ 9.39	$ 8.51	$ 8.45
Transportation costs	$ 24,500.00	$ 24,500.00	$ 24,500.00
Transportation Cost (every two months	$ 59,500.00	$ 69,500.00	$ 84,500.00
Total Annual Sea Transportation Cost	$ 357,000.00	$ 417,000.00	$ 507,000.00
Total Annual Transportatin Cost(inc. train)	$ 360,958.75	$ 422,103.75	$ 513,250.00

Figure 25

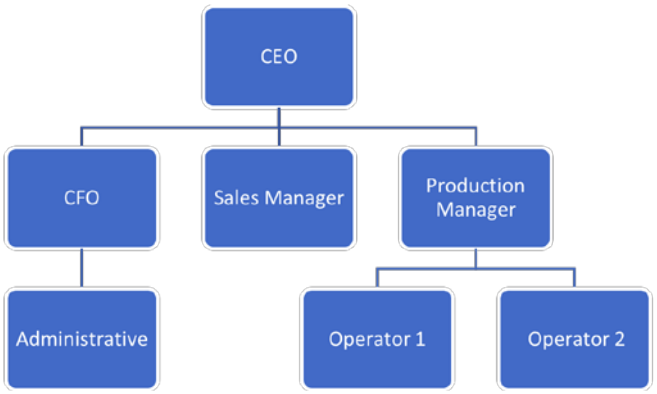


Figure 26 – Beta Calculation

Unlevered β was obtained from Bloomberg. In the cases indicated with (*) this were calculated as follows due to lack of information: ***Unlevered β = β levered / [1 + (1-t)*(D/E)]****;* t being the company's Effective Tax Rate and D/E the Debt to Equity Ratio.

COMPANY NAME	COUNTRY	% OF REVENUE FROM BIOFUELS	BETA UNLEVERED
CROPENERGIES AG	GERMANY	100%	0.41
REX AMERICAN RESOURCES CORP*	UNITED STATES	100%	1.38
HIGHWATER ETHANOL LLC	UNITED STATES	80%	0.23
GRANITE FALLS ENERGY LLC	UNITED STATES	80%	-0.12
CARDINAL ETHANOL LLC	UNITED STATES	78%	-0.39
GREEN PLAINS INC	UNITED STATES	71%	1.22
INDO ACIDATAMA TBK PT*	INDONESIA	59%	0.02
		Average	**0.39**

Source: Bloomberg (2017)

Figure 27

SCENARIO 3: BALANCE SHEET																
	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11	YEAR 12	YEAR 13	YEAR 14	YEAR 15
Assets																
Fixed Assets	12,435,000	12,435,000	12,435,000	12,435,000	12,435,000	12,435,000	12,435,000	12,435,000	12,435,000	12,435,000	12,435,000	12,435,000	12,435,000	12,435,000	12,435,000	12,435,000
Cash and Cash Equivalents	4,764,331	5,138,628	10,013,767	16,185,015	23,411,800	30,492,753	37,420,583	44,187,634	50,785,867	57,206,841	63,441,694	69,481,118	75,315,343	80,934,109	86,326,642	91,481,632
Operating Current Assets		7,521,403	9,945,367	12,058,883	12,058,883	12,058,883	12,058,883	12,058,883	12,058,883	12,058,883	12,058,883	12,058,883	12,058,883	12,058,883	12,058,883	12,058,883
Total Current Assets	4,764,331	12,660,032	19,959,134	28,243,898	35,470,682	42,551,635	49,479,465	56,246,516	62,844,750	69,265,724	75,500,576	81,540,001	87,374,226	92,992,991	98,385,525	103,540,514
Total Assets	**17,199,331**	**25,095,032**	**32,394,134**	**40,678,898**	**47,905,682**	**54,986,635**	**61,914,465**	**68,681,516**	**75,279,750**	**81,700,724**	**87,935,576**	**93,975,001**	**99,809,226**	**105,427,991**	**110,820,525**	**115,975,514**
Equity & Liabilities																
Equity	17,199,331	21,935,371	28,193,448	35,544,183	42,755,283	49,819,769	56,730,307	63,479,202	70,058,372	76,459,329	82,673,163	88,690,519	94,501,572	100,096,007	105,462,993	110,591,158
Long Term Liabilities																
Operating Current Liabilities		3,159,661	4,200,685	5,134,715	5,150,399	5,166,867	5,184,158	5,202,314	5,221,378	5,241,395	5,262,413	5,284,481	5,307,654	5,331,984	5,357,532	5,384,356
Total Liabilities	**0**	**3,159,661**	**4,200,685**	**5,134,715**	**5,150,399**	**5,166,867**	**5,184,158**	**5,202,314**	**5,221,378**	**5,241,395**	**5,262,413**	**5,284,481**	**5,307,654**	**5,331,984**	**5,357,532**	**5,384,356**
Total Equity & Liabilities	**17,199,331**	**25,095,032**	**32,394,134**	**40,678,898**	**47,905,682**	**54,986,635**	**61,914,465**	**68,681,516**	**75,279,750**	**81,700,724**	**87,935,576**	**93,975,001**	**99,809,226**	**105,427,991**	**110,820,525**	**115,975,514**

Figure 28

SCENARIO 3: INCOME STATEMENT EXPECTED PRODUCTION																
	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11	YEAR 12	YEAR 13	YEAR 14	YEAR 15
TOTAL SALES		45,128,420	59,672,200	72,353,295	72,353,295	72,353,295	72,353,295	72,353,295	72,353,295	72,353,295	72,353,295	72,353,295	72,353,295	72,353,295	72,353,295	72,353,295
RAW MATERIALS		32,893,111	44,091,103	53,989,105	53,989,105	53,989,105	53,989,105	53,989,105	53,989,105	53,989,105	53,989,105	53,989,105	53,989,105	53,989,105	53,989,105	53,989,105
UTILITIES		250,000	341,250	465,806	489,097	513,551	539,229	566,190	594,500	624,225	655,436	688,208	722,618	758,749	796,687	836,521
THIRD COUNTRY PARTY TAX 6.5%		2,095,208	2,735,915	3,350,100	3,350,100	3,350,100	3,350,100	3,350,100	3,350,100	3,350,100	3,350,100	3,350,100	3,350,100	3,350,100	3,350,100	3,350,100
GROSS PROFIT		**9,890,100**	**12,503,932**	**14,548,283**	**14,524,993**	**14,500,538**	**14,474,861**	**14,447,899**	**14,419,590**	**14,389,865**	**14,358,654**	**14,325,882**	**14,291,471**	**14,255,340**	**14,217,403**	**14,177,569**
LABOUR		705,000	740,250	777,263	816,126	856,932	899,779	944,767	992,006	1,041,606	1,093,686	1,148,371	1,205,789	1,266,079	1,329,383	1,395,852
SUPPLIES		306,000	321,300	337,365	354,233	371,945	390,542	410,069	430,573	452,101	474,706	498,442	523,364	549,532	577,009	605,859
GENERAL WORKS	300,669	300,669	315,702	331,488	348,062	365,465	383,738	402,925	423,071	444,225	466,436	489,758	514,246	539,958	566,956	595,304
DEPRECIATION 15 years		829,000	829,000	829,000	829,000	829,000	829,000	829,000	829,000	829,000	829,000	829,000	829,000	829,000	829,000	829,000
TRANSPORT		1,365,940	1,862,704	2,365,450	2,458,060	2,555,301	2,657,403	2,764,611	2,877,179	2,995,375	3,119,481	3,249,793	3,386,620	3,530,289	3,681,141	3,839,535
OPERATING PROFIT	**-300,669**	**6,383,491**	**8,434,976**	**9,907,718**	**9,719,512**	**9,521,896**	**9,314,399**	**9,096,527**	**8,867,761**	**8,627,557**	**8,375,343**	**8,110,518**	**7,832,452**	**7,540,483**	**7,233,915**	**6,912,019**
INTEREST COST		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EBT	**-300,669**	**6,383,491**	**8,434,976**	**9,907,718**	**9,719,512**	**9,521,896**	**9,314,399**	**9,096,527**	**8,867,761**	**8,627,557**	**8,375,343**	**8,110,518**	**7,832,452**	**7,540,483**	**7,233,915**	**6,912,019**
TAX RATE AT 20%	0	1,276,698	1,686,995	1,981,544	1,943,902	1,904,379	1,862,880	1,819,305	1,773,552	1,725,511	1,675,069	1,622,104	1,566,490	1,508,097	1,446,783	1,382,404
NET PROFIT	**-300,669**	**5,106,793**	**6,747,981**	**7,926,175**	**7,775,610**	**7,617,517**	**7,451,519**	**7,277,221**	**7,094,209**	**6,902,046**	**6,700,274**	**6,488,415**	**6,265,962**	**6,032,386**	**5,787,132**	**5,529,615**
DIVIDENDS		370,753	489,903	575,440	564,509	553,032	540,980	528,326	515,040	501,089	486,440	471,059	454,909	437,951	420,146	401,450
RETAINED EARNINGS		**4,736,040**	**6,258,078**	**7,350,734**	**7,211,101**	**7,064,485**	**6,910,539**	**6,748,895**	**6,579,169**	**6,400,957**	**6,213,835**	**6,017,356**	**5,811,053**	**5,594,435**	**5,366,986**	**5,128,165**

Figure 29

SCENARIO 3: CASH FLOW																
	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11	YEAR 12	YEAR 13	YEAR 14	YEAR 15
EBT	-300,669	6,383,491	8,434,976	9,907,718	9,719,512	9,521,896	9,314,399	9,096,527	8,867,761	8,627,557	8,375,343	8,110,518	7,832,452	7,540,483	7,233,915	6,912,019
Depreciation		829,000	829,000	829,000	829,000	829,000	829,000	829,000	829,000	829,000	829,000	829,000	829,000	829,000	829,000	829,000
Working Capital		4,536,343	4,532,649	4,521,770	4,510,347	4,498,353	4,485,759	4,472,535	4,458,650	4,444,071	4,428,763	4,412,690	4,395,813	4,378,092	4,359,485	4,339,948
	-12,435,000															
NET CASH FLOW	-12,735,669	2,676,148	4,731,327	6,214,949	6,038,166	5,852,543	5,657,640	5,452,992	5,238,111	5,012,486	4,775,580	4,526,828	4,265,639	3,991,391	3,703,430	3,401,071
Discount factor	1.00	1.07	1.15	1.23	1.32	1.42	1.52	1.63	1.75	1.88	2.02	2.16	2.32	2.49	2.67	2.86
Disconted Cash Flow	-12,735,669	2,495,010	4,112,514	5,036,446	4,561,985	4,122,453	3,715,426	3,338,645	2,990,008	2,667,553	2,369,453	2,094,008	1,839,631	1,604,844	1,388,273	1,188,636
NVP	28,705,217															
IRR	27.33%															

Figure 30

SCENARIO 3: RATIO ANALYSIS																
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11	YEAR 12	YEAR 13	YEAR 14	YEAR 15	average
RoE	29.2%	38.6%	45.3%	44.4%	43.5%	42.6%	41.6%	40.5%	39.4%	38.3%	37.1%	35.8%	34.5%	33.1%	31.6%	38%
Roce	36.5%	48.2%	56.6%	55.5%	54.4%	53.2%	52.0%	50.7%	49.3%	47.9%	46.3%	44.8%	43.1%	41.3%	39.5%	48%
Assets Turnove	38.1%	42.1%	44.8%	56.2%	66.2%	76.0%	85.6%	94.9%	104.0%	112.9%	121.5%	129.9%	137.9%	145.7%	153.2%	94%
Profit Margin	11.3%	11.3%	11.0%	10.7%	10.5%	10.3%	10.1%	9.8%	9.5%	9.3%	9.0%	8.7%	8.3%	8.0%	7.6%	10%