Biofuels Markets and Policies in Russia

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Abstract. This paper provides an overview of biofuel's markets and policies in Russian Federation. It shows that one of the many barriers that hinder biofuel development is strong oil and gas lobby, which cooperates with Russian government. The main obstacle for the development of biofuel's sector in Russia is a significant lack of coherent policy and regulation. Creation of healthy biofuel's sector requires authorities to found a new governing body, owning adequate rights, staffed with qualified personnel and resistant to the external influence. In order to reduce the uncertainty in biofuels sphere, the government would have to provide sustained long-term policy commitment and clarify the energy strategy. These actions would bring confidence in investments into sector of biofuels and motivate the growth within industry. Until the proposed incentives are not established on the legal base, the progress in the sector of biofuels is not possible. Even in case of the growing support from the government, the rapid flourishing of the sector is not expected.

Key words: Eastern Europe; Biofuels; Ethanol; Biodiesel

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1. Introduction

While in the developed countries biofuels slowly but surely replace traditional fossil fuels, Russian economy does not move in in line with the development of this global emerging industry. It is commonly known, that Russian Federation is the largest natural gas exporter as well as the second biggest producer and exporter of crude oil. Besides it has huge renewable energy sources. However mainly due to the huge reserves of traditional energy resources and no obligations established from Kyoto's protocol on reducing CO2 emissions, the development of the renewable energy policies and incentives, especially in biofuels industry has been given very little attention. This is despite the fact that Russia is one of the Top 5 biggest emitting countries with the share of 5% in 2014 (Trends in global CO2 emissions: 2015 Report). Moreover, for the last four decades, the average year-round temperature in Russia has increased by 0.04°C per year, more than twice the global average. While climate in Russia is getting warmer, it is also getting rainier: every decade the annual average rises by 2% (Katona, 2016). Even though the solution of environmental problems is not the government's priority, the current consequences of Russian apathy force changes in the approach to the environment.

Table 1: Russian Federation key indicators 2015

Population (millions)	143.82
GDP (billion 2015 USD)	1326.02
Energy production (Mtoe)	1305.68
CO2 emissions from fossil-fuel use only (Mt of CO2)	1467.55

The situation had changed in 2006, moved by the need of energy sources diversification and new opportunities for agricultural commodities. Participation in the global development of advanced technologies, the desire to improve the energy efficiency and international cooperation – these and other considerations pushed Russia to development of low carbon economy and green energy support.

Table 2: Biofuels in the balance of the total primary energy supply (TPES) in Russia

Supply (ktoe)	2007	2008	2009	2010	2011	2012	2013	2014
Liquid biofuels	0	0	0	0	0	0	0	0
Primary solid biofuels	3757	3159	2902	2948	3023	3180	3025	2762
Industrial waste	2920	3074	3466	3996	4066	4254	4208	4311
Biofuels and waste*	6676	6233	6368	6944	7089	7434	7233	7073

Biofuels and waste, % of TPES	1.0%	0.9%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
TPES	672590	688464	647001	688397	721871	739925	728818	710883

*Total primary supply of biofuels taking into account stock changes and net export

Source: IEA, 2016

Since 2006, numbers of government incentives in promotion of biofuels have been established on federal level as well as in selected regions with highest production potential that are rich with the feedstock. Based on the International Energy Agency (IEA), estimated share of biofuels in the total primary energy supply (TPES) in Russia is 1% in 2014 with zero contribution from the liquid biofuels (see Table 3). Throughout last 7 years percentage of biofuels has never achieved higher level than current. Volume of bioethanol and biodiesel produced in Russia is meagre. According to the GAIN report, biofuels correspond to 5% of heating energy and 1% of electrical power (2016). Apart from IEA/OECD data represented in the table above, there is no official Russian statistics providing the exact number of produced biofuels or available data from the different sources contradict with each other.

2. Feedstock potential

The potential sources for renewable energy in Russian Federation are vast; however their usage is very poor. As reported by the Federal Forestry Agency: biomass production is the main alternative for developing biofuel sector. The second largest, after hydro energy, source of renewable energy is biomass and waste. Estimated volumes of biomass, accessible for bioenergy extraction contain 800 million tons of wood, 250 million tons of agricultural wastes, 70 million tons of wood wastes from forestry and pulp and paper industries, up to 60 million tons of municipal solid wastes and 10 million tons of sewage wastes annually. From these sources could be produced 70 Mtoe of biogas (120 billion m3) and 21- 28 Mtoe of ethanol per year (IEA, 2003). In the table below are given technical, economic and gross potentials of RES in Russia excluding potential from energy crops. Gross potential is total volume of available renewable sources for further production of biofuels. Technical potential corresponds to part of the gross potential, which can be productively used based on the known technologies, social and ecological factors. And economic potential represents part of the technical potential, which utilization is economically adequate considering current fossil fuels prices, heat and electricity, equipment and materials, transportation and wages. However, nowadays the

economic potential is expected to be lower, taking into account current low oil prices environment. The biomass utilization in the energy balance is extremely low and corresponds to only 1% from the total primary energy supply (Strukova, 2008).

Table 3: Potential of biomass energy sources in Russia

Indicator (million tons of coal equivalent per year)	Gross potential	Technical potential	Economic potential
Biomass energy	10 × 103	53	35
Share of biomass in TRES potential	0.4 %	1.2 %	12.8 %
Total Renewable energy sources	2.34 × 106	4593	273.5

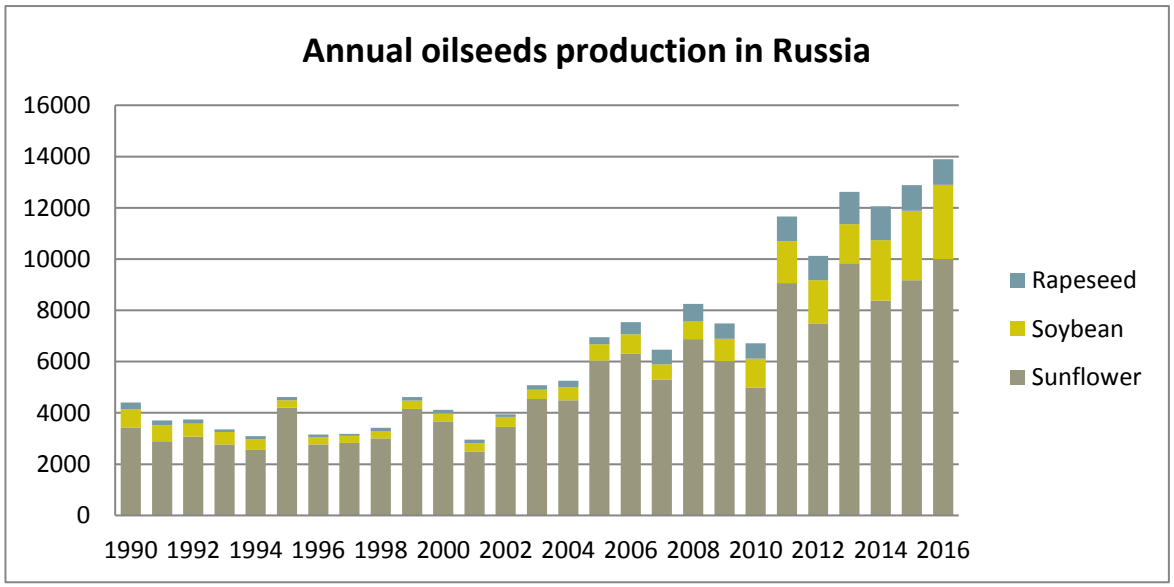
Source: "Renewable energy in Russia: from opportunity to reality", OECD/IEA, 2003

Particularly attractive region for production of advanced biofuels from lignocellulosic material is north and north-west of the European part of Russia. The region focuses on the timber and pulp and paper industries because of its rich forest resources. These industries are big potential suppliers of biomass wastes as well as potential users of biofuels for their own needs. In Finland, where the climate and resources availability are similar to the north European part of Russia, lignocellulosic fuels extracted from wood have 20% share in the total energy consumption. The development of biofuels utilization from wood wastes would increase energy security and reduce costs in the mentioned industries (IEA, 2003). Nonetheless the availability of wood resources is restricted by number of obstacles such as problematic transportation, outdated technical equipment and the remote access to domestic and foreign markets (Pristupa, 2010).

Availability of arable land brings opportunities for sowing of energy crops, which was not taken into account in the table above. The main potential feedstock for bioethanol production in Russia is grain. In 2016 Russia harvested the record volumes of wheat in the recent years - 62.03 million tons, up 32% from the same period of last year (Demaree, 2016). Total grain yield in 2016 was about 110 million tons; meanwhile the storage capacity is only 120 million tons, which is distributed unevenly with the manufacturing. In 2015 30 million tons of grain was exported and large portion of it goes to feed animals or bioethanol production in Europe (Ministry of Agriculture Russia, 2016). The wheat export is expected to rise due to the government's incentives to lift the export duties. Therefore excess of wheat won't contribute to the stimulation of bioethanol production but it will be exported. By 2030 the grain yield should increase by 30% approximately compared with the current amount. That figure is

based on the Grain market development strategy until 2030 from the Russian Ministry of Agriculture (Ministry of Agriculture Russia, 2015). Nonetheless increases of the grain yield will not necessary change the situation with bioethanol production. The growth in the volumes of grain could be consumed by the expansion in livestock (growth of livestock in first half of 2015 reached 5, 2% in comparison with the same period 2014).

Besides there is huge capacity for the production of ethyl alcohol which is not fully utilized and could be used for production of bioethanol (Karpov, 2007). According to Baklanova (2007) about 190 plants are operating only at two thirds of their capacity and have obsolete technical equipment. Even though Russia has already long-term experience in the production of ethanol by hydrolysis technologies, the scientific knowledge base along with technologies are yet obsolete in spite of current continuously developing global biofuel industry (Pristupa, 2010).



Graph 1: Annual production of crops for biodiesel extraction in Russia
Source: United States Department of Agriculture, 2016

The main source of the feedstock for biodiesel production in Russian Federation is the same as in Europe - the rapeseed; it is prevalent in the Volga region, Central and Siberian Federal districts. Potentially up to 5,5 Mt of rapeseed oil could be annually produced in Russia, from what 0,5 Mt can be directed to satisfaction of all food needs, 2 million tons to be exported in the form of methyl ester and the rest is for domestic biofuel production (based on the draft

of Russian Federal Law "About the development of production and consumption of biofuels", 2014). Graph 4 below shows production of oilseeds from potential feedstock in the country. Last six years were successful for all three potential feedstock crops. Meanwhile Russia exports more than 60% of rapeseed oil annually. In the 2014/15 season 240 kt were exported (from 365 kt produced), less than 337 kt (495 kt produced) in the previous year. Biggest consumers of Russian rapeseed oil are Norway, Lithuania and China (UkrAgroConsult, 2016).

3. Russian incentives in the biofuel industry

Energy strategies

After dissolution of USSR in 1991 Russia started to work out on drafts of long term energy policy. Concept of the new energy policy appeared first in 1992, followed by Main Directions of New Russian Energy Policy till 2010 submitted in 1995 and Main provisions in the structural reform of natural monopolies in 1997. After these documents, in last decades there have been formulated and approved 3 official Energy Strategies for the periods until 2020, than 2030 and last one till 2035. Between 1995 and 2000 a few policy documents were formulated, which for the first time have acknowledged renewable energy sources; nonetheless the priority was addressed to attain stability in mining of fossil fuels. Moreover as a result of poor functioning of the whole economy during last decade of the 20th century, many goals had not been accomplished (Russian Energy Survey, 2002). Overall, promotion and developing of renewables sector was not a country's priority in 90s, while the privatization took place, including oil and gas companies.

The most important is that Russian strategies do not have aspect of direct actions; however they include guidelines and highlight priorities for further development. Thus it is necessary to review the documents regularly. Appropriate changes are supposed to be implemented every five years in order to cover new trends, technologies and challenges in the economy and the energy complex.

Russian Energy Strategy till 2020

In 2003 Energy Strategy (ES) was approved for the period up to 2020, which reflects both the new economic program and the restructuring of the economy. Therefore considering fiscal and price reform, the strategy depended on the successful fulfilment of Economic Development plan from the Ministry of Economic Development and Trade.

The main objective of the new strategy was achieving a qualitatively new status of fuel and energy complex, increasing the competitiveness of its products and services on the global market and formation of adequate policies, taking into account forecasted results of its utilization. For the above listed purposes, the document indicates the projected role of renewable sources of energy including biofuels.

The strategy outlines strategic goals regarding development of renewables as reducing the consumption of traditional fossil fuel (oil and gas), minimazing the environmental strain from fuels and energy field activities, and securing the reliable and sustainable biofuels supply to remote regions along with reducing costs on imported fuels. Meanwhile the strategy examines only few of biofuels as an alternative to traditional fuel; particularly it indicates peat and firewood as most favourable. However utilization of peat produces higher GHG emission than natural gas, crude oil and coal depending on the energy generated. Framework Convention on Climate Change of United Nations treats combustion of peat in the same way as combustion of fossil fuels, based on its negative impact and amount of GHG emissions. Firewood was also estimated as very demanding fuel, based on the fact that it is used by more than 5 million families in Russia. Thus its demand is far above the production level. Therefore the strategy rather inadequately concludes guidelines to overcome the Russian backwardness in development of RES. The document infers that the important aim is to secure the state support for creating enough reserves of peat and firewood, what seems laggard, considering set up objectives. Nonetheless strategy also acknowledges the need for new legislation on renewable energy sources.

Altogether Russian Energy Strategy till 2020 not only doesn't set up certain targets and roadmaps in the RES sphere, but also doesn't acknowledge more progressive biofuels such as biodiesel, biogas, bioethanol etc. In consequence the lack of the legislation base as well as guidelines for further development of RES did not attract required investments into this sector.

Russian Energy Strategy till 2030

In 2009 Russian Parliament approved new Energy Strategy for the period until 2030, which was triggered by the remarkable changes in the external indicators of energy sector. In particular: rise in oil prices from 27$ US to 94 per barrel during first 5 years of implementation, which was 4 times higher than projected parameters. Although, the global economic crisis 2008-2009 returned most of the indicators back to the forecasted levels, it pointed at the need

to take into account higher possible fluctuations in the variables. The new guidelines of the Energy Strategy were influenced by the "Conception of Long-Term Socio-Economic Development of the Russian Federation up to 2020" affirmed in November 2008 and that supposed to help the economy follow an innovative and socially oriented rout. Disregarding the consequences of crisis in 2008, the main goals and guidelines for the economy's transition to the innovative stage were established as fixed parameters (Energy Strategy of Russia for the period up to 2030, 2010).

The new strategy was planned to be fulfilled in 3 stages:

- 2010- 2015: recovery from crisis and building the foundation for the new economy. The main focus in this stage was to achieve sustainable economy and energy sector development including renovation and modernisation of the Russian fuel and energy complex.
- 2016- 2022: stage of transition to innovative development and establishing the infrastructure of the new economy. Dominant role is increase of energy efficiency in energy complex as well as in the whole economy, resulted by fulfilling the objectives of the first stage of this Strategy.
- 2023- 2030: phase of the development of innovative economy and accordingly the gradual transition to the highly efficient usage of traditional resources and new no-hydrocarbon energy sources.

Certainly the new strategy provides bigger role to RES in comparison with the old Energy Strategy until 2020. The total investments projected to the sector of renewables during 3 stages reach around 124 billion USD. It is approximately 5% from all investments planned for the Strategy implementation. The target set up for the RES is to attain during first stage 0,3% in the total energy balance, 0,7% in the second phase and 1,4% till 2030.

Table 5: Investments of Russian Energy Strategy till 2030 (in billion USD)

	Phase 1	Phase 2	Phase 3	2009-2030 Total
Renewable energy	7-9	24-28	82-97	113-134
Total for the Strategy Implementation	534-554	516-665	1.308-1.552	2.366-2.765
Share of RE investment (%)	1.5 %	4.4 %	6.3 %	4.8 %

Source: Russian Energy Strategy till 2030, 2010

Based on the document, the Strategy also settles the objectives for non-carbon energetics, which, apart from hydropower stations and nuclear power, contains renewables (wind, solar, geothermal, hydro and bioenergy). The forecasted percentage of non-carbons in the energy balance will rise to 4% during the implementation and reach 14% in 2030. Therefore this target incorporates 1,4% from RES, however main contribution will be made by expansion of hydro- and nuclear energy. Meanwhile the document observes electricity generation maintained from the renewables including projected targets and roadmaps for its fulfilment. Specifically, forecasted electricity production from RES will increase from 1,5% in year 2010 to 8% in 2030. The revised Strategy also includes the expanding of the production and usage of different types of biofuels, produced from biomass as one of the objective to deal with on the path to innovative policy in energy sector. Nonetheless, this ambition will take action only in 3rd stage of the exertion and is not supported with certain quantitative goals or guidelines for its fulfilment. In this regard biomass isn't supposed to play influential role in energy complex.

As reported by the professor Bushuev, who was working on the creation of all three Energy Strategies, the scenario of the strategy up to 2030 was too optimistic, thus it proved to be unrealistic. In reality the stagnation of global economy dragged, what affected low level of energy demand. Over and above the forecasted development needed additional analysis and substantial revision due to geopolitical crisis began in 2014, which entailed financial, technological and other sanctions against Russia along with deep and continuous fall in oil prices on the world market. These and other events had affected a fracture of several long-term trends in global development and the beginning of a new phase of deteriorated competition for resources and markets. In this regards, priorities, objectives, projected scenarios and implementation indicators of the Energy Strategy until 2030 were adjusted into the draft of the new strategy.

Draft of the Russian Energy Strategy till 2035

The draft of the Energy Strategy until 2035 had been created in 2015 during difficult time for Russia. And the role of the energy sector became questionable considering the further development of the country. The new ES revised objectives and guidelines of the development of Russian fuel and energy sector and it is aimed to support the evolution from the "resource-extraction" to "resource-innovation" stage, including energy sources diversification, technological growth and reducing barriers in the infrastructure.

Based on the document, the projected structure of domestic consumption is supposed to be relatively stable (in terms of gas and oil consumption) with small decline in solid fuels (2,5- 3%) that will be compensated by non-carbon sources (RES and nuclear power). The updated Strategy implementation is divided into 2 stages: first stage roughly until 2020 (with possible extension until 2021) and the second approximately from the year 2021 up to 2035. The production forecast for non-carbon sources assumes a rise for 12% during the first stage of implementation in comparison with the base year and for 65% during the next stage (2014 was settled as the base year).

The blueprint of the next Strategy pays much more attention to the electricity generated from renewables. The electricity growth in production from power plants based on RES is set on 10-14 times higher than in the base year. Although the biogas installations are mentioned, the growth would be mainly affected by development of solar and wind energy resources. Among that, the local fuels (peat, municipal solid and wastes from the wood production and agriculture) are highlighted as promising sphere, especially their utilization in the remote areas of Russia.

The objectives determined in ES till 2035 are: introduction of new generating capacities based on the RES and development of scientific base and advanced technologies in this sector. Yet again the revised draft of the new strategy does not consider more advanced biofuels as a part of energy balance and their contribution to further growth of the RES. The fulfilment of all incentives of the ES will require total investments in the amount of US $2550 billion roughly. And the volume of investments particularly into RES in final stage is projected to be 5-7 times higher than in first stage. The share of renewable energy financing from the total investments into the strategy will increase up to 10-12%. In conditions of geopolitical crisis the chances to attract foreign investments for Russian companies became prominently lower. Thus the main sources of investments are planned to be companies own funds and loans.

There are formed two forecasted plans in order to evaluate prospects of further development: “conservative” and “target” scenarios. The conservative scenario takes into account US and EU sanctions of 2014 against Russian banking and energy sector and assumptions about fall of oil “Urals” (main product of Russian export) down to US $55/Bbl. in 2015. The growth of Russian economy was expected to be moderate, on average 1,9% annually till 2035. Meantime the target scenario presumes using maximum potential from

energy complex in order to accelerate economic growth, followed by optimistic forecast regarding global demand and oil prices. In the process of developing scenarios numerous risks were reviewed and analysed, including increasing of competition on global energy market, limitation of access to key technologies and markets in the energy sector, a sharp decline in the prices of hydrocarbons and the uncertainty about their future dynamics, and slowdown of Russian economy. The document claims that in case the internal and external risks would not allow accomplishing of the target scenario, it still be possible to run the conservative scenario.

Although the revised draft of the strategy offers two possible scenarios of the strategy implementation and it considers various risks, it still looks quite optimistic, considering the real dynamics in the economy. In 2015 the average decline in GDP growth reached -3,7% (Trading Economics, 2016). Furthermore, forecasted "Urals" oil price in the conservative scenario turned up to be far away from the actual number, which was US $29,69/Bbl. in January- February 2016 (Minprom, 2016). Not only reality does not allow employing the target scenario offered in the draft, but also the fulfilment of the conservative plan became uncertain. In this regard it is understandable, that new version was not approved yet and the draft of the Energy Strategy until 2035 is about to be revised.

Despite all Energy Strategies documents analysed, none of mentioned programs and projects, aimed to develop biofuels sphere and RES sector in general, is not accomplished.

Legislation in the Russian sphere of biofuels

Nowadays bioethanol is not used in Russia for production of biofuels since it is highly expensive in comparison with gasoline. In fact 80% of Russian ethanol is used to make alcoholic beverages (Medvedkova & Trudajeva, 2013). An excise tax on bioethanol, as on alcohol-containing liquid, reaches 102 RUB ($1.62) per litre, what represents approximately 90% of its production costs and is three times higher than current average price of gasoline (37-38 RUB/liter in April 2016). In addition, ongoing legislation does not provide a definition of bioethanol; in this regard it does not allow introducing specific governance of its turnover.

First attempt to change the ongoing taxation was part of the federal target program "Energy-Efficient Economy" in 2006. The draft legislation, offered by number of deputies in Russian Parliament (Duma), supposed not only lift the excise tax but also ease the regulation on biofuels blends with less than 10% of ethyl alcohol. This initiative should make bioethanol

more attractive for alcohol producing factories. After all, due to upcoming national elections and the change in Duma, the draft had not become a law (USDA, 2007).

For many years Russian bioethanol supporters have been lobbying for the reduction of excise tax that hinders development of the industry. Meanwhile government has not been ready to make a controversial decision with a risk of increase in production of vodka under the guise of bioethanol. The consumption of alcohol is a big problem in Russia, especially in the conditions of unstable economy after the recent crisis and weak ruble. Recently the initiative to reduce an excise tax on bioethanol became an objective of amendments in Federal Law №171, regulating the production of bioethanol, which should come into force in 2017. Ministry of Economic Development supported the idea of differentiation of the bioethanol and bioethanol as motor fuel as separate products. Thus the excise tax for the biofuels containing alcohol is expected to be cancelled in 2017 (Infobio, 2015). The aim of the changes proposed for the Federal Law №171 is to create favourable environment for the development of bioethanol and motor fuels with the addition of bioethanol. The draft introduces the definition of bioethanol as an alcohol-containing non-food product and excludes it from the Law №171 force. Moreover the new act will repeal the floor for bioethanol prices and contribute to resolving obstacles for companies planning to produce bioethanol in Russian Federation. As reported by the Russian Biofuels Association, realization of the Federal Law №171 would increase bioethanol production potential to 2 million tons. Besides the potential for utilization of bioethanol in E95 blends with fossil gasoline would rise up to 5%. Nonetheless the document has not been approved so far and taking into account previous experience in the similar projects, there is a possibility that the amendments won't be finalised.

Standardisation of biofuels

Earlier in 2009 standard had been developed that introduces key definitions and terminology in the biofuel sector (GOST P 52808-2007). However first technical standard for motor fuels with addition of bioethanol was already developed in 2002 (National Standard GOST P-51866- 2002), which permitted the mixture of gasoline with 5% of bioethanol. Next followed standard in 2004 that is applied to liquid motor fuels containing bioethanol from 5% up to 10% (GOST P 52201- 2004). Nowadays new interstate standard on bioethanol is being developed; it is based on the ongoing GOST 53200-2008 and settles the technical specifications, taking into account:

- The draft of amendments into Federal Law №171 about turnover of ethyl alcohol;
- New editions of foreign standards on bioethanol (ASTM D 4806-2014, EN 15376-2014);
- New Russian and interstate standards on test methods of bioethanol;
- Proposals from bioethanol producers, consumers and technical experts.

Regarding biodiesel: the technical standard allowing blends of 5% biodiesel with conventional fuel was authorized already in 2005 (GOST P 52368- 2005). Nonetheless, technical standards do not obligate to use a mixture of a gasoline and bioethanol or biodiesel blends.

International collaboration

Earlier in 2005 Russian Ministry of Economic Development and Trade along with World Bank cooperated on the "Russia Sustainable Energy Finance Program" (RSEFP). The program is subsidized by Russian Government, International Finance Corporation on behalf of the World Bank and the Global Environment Facility. The initiative was to increase the capital flow to energy efficiency programs from Russian financial institutions and deal with main obstacles for the further development of renewables:

a) Institutional barriers: the shortage of legislation abutment, inefficient regulations in the field of environmental regulations, insufficient presence of private sector in the power and heat producing sectors, rigidity of municipalities etc.;

b) Information barriers identified as lack of information available regarding RES in general;

c) Financial shortage of domestic as well as foreign investments; high transaction and preparation costs of project along with the inadequacy of conditions for long-term debt financing, expensive required equipment for project implementation and finally loss of competitiveness because of low prices on fossil fuels;

The project includes three main parts: technological assistance, investment support and activities focused on improvement of investment environment. The expected program's outputs are improvement of Russian knowledge base, development of framework and market for the further RE growth; and investment boost into RE projects by implementation of credit lines for Russian financial organizations. The RSEFP was initially introduced as five years program; nonetheless it was extended twice till June 2012 and further to December 2012. As a result, 342 projects were financed through RSEFP with expected outcome in reduction of

559 kt of CO2 annually (Terminal Evaluation of the Russia Sustainable Energy Finance Program, IFC, 2013).

Local incentives

After 2006, during period of biofuel excitement in Russia, a number of local investment projects focused on production of biofuels was initiated. These intentions originated in different districts of the country and most investments were motivated by growing demand from Europe. Local utilization and derived share in demand for biofuels was insignificant, thus did not play significant role in business decisions (Pristupa, 2010).

The Russian Ministry of Energy confirms that there are no operating biofuel projects supported by Russian federal government. Most of biofuel businesses in the country are financed by regional governments or foreign investors. There is no large-scale production of bioethanol or biodiesel, except few facilities backed by regional authorities or private companies. Majority of these projects is only at the development stage and manage to extract volumes of biofuel sufficient only for their own operation (USDA, 2016).

Currently there only four projects on production of bioethanol in Russia: only two of them are operational and others are in the stage of development. For instance Kirov "BioChemPlant" Co., Ltd. focuses on the bioethanol production from the waste timber industry, and is the only manufactory, producing bioethanol from renewable non-food raw materials. In cooperation with Russian center of science «Applied chemistry» in St. Petersburg company creates the technology for the production of the green gas - biomethane. The future production of biomethane by BioChemPlant is estimated to reach 4 million m^3. "Miranda" Ltd. is located in the Republic of North Ossetia-Alania and it is supplied by bioethanol feedstock from sugar mills in Krasnodar region. The company has production potential of 100 tons per day of bioethanol and additional products including wood pellets and plans to export to Turkey, Poland and Sweden in the nearest future.

The extraction of rapeseed oil on a commercial scale has begun only in 2007. And there is no national government program for the support of biodiesel production so far. Meanwhile regional program have been already created in 2006 in Altai region, called "Rapeseed – biodiesel". This region was chosen due to its high potential in production, which is estimated to provide 170- 200 thousand tons of biodiesel per year. Unfortunately first regional program

from 2006 did not succeed, but recently in 2016 new program based on development of energy-closed cycle industrial agglomeration have been modelled (Farkov, 2016). Regional program have been also created in Lipetsk, where exists an Association of rapeseed oil producers.

4. Conclusions

Since the 2008 until nowadays, there were no noticeable changes and improvements on liquid biofuels market in Russia. It is similar in policy framework, where none of introduced incentives and policies have been finalized and actually came into practice. Available literature sources both in Russian and English usually lack real empirical data and in most cases contain outdated information about the development of biofuels sector in Russia, observing only theoretical potential in this area.

The development of bioethanol production in Russian Federation is currently constrained by regulation of its manufacturing and handling, namely due to standards established by federal law about the state regulation of production and turnover of ethyl alcohol, alcohol, alcoholic products and about the limitation of the alcohol consumption. The cancellation of the excise tax on bioethanol, as on alcohol- containing liquid, would be the first required step for the development of bioethanol production in Russia. Besides, for the vital grow in the industry it is necessary to build specialized plants with the high automation level, which Russia still lacks.

While production of bioethanol is not profitable in regard with high taxation, there is no such an obstacle for biodiesel manufacturing. Nonetheless no functional supporting government program does exist and delays in the collection and processing of rapeseed also hinder biodiesel industry expansion (Medvedkova & Trudajeva, 2013).

In conclusion, the main factors holding up the Russian biofuel industry expansion and finalization of initiated supportive programs are:

- Lack of functional regulatory framework that stimulates production of biofuels and their utilization on a retail market. The main reason is low prices of traditional energy sources and sufficiency of oil and gas reserves;
- Outdated technological and scientific base in the sphere of biofuels;
- High excise taxation on bioethanol as the liquid containing alcohol;

- Technical obsolescence of the equipment in the transport sector, which is not prepared to utilize such energy sources;
- Consumers market is not prepared for deep biofuels implementation, in particular absence of cars with flex-fuel engines suitable for higher biofuel blends;
- Lack of experience in the development of renewable energy projects. As a result low level of projects suitable for bank financing;

In addition the development in sector of biofuels without supporting measures in agriculture could bring risk of increase in prices of grain, corn and other crops due to rise of demand from the side of biofuel producers. Thus it could lead to the shortage of crops on the domestic market and the fall of profitability in animal breeding. Due to the August 2014 food embargo, the support of agricultural sector is major priority for Russian government. After fall of oil prices and government interventions, the ruble had been weak and extremely volatile. This led to accelerating inflation that reached 12.9% in year 2015. Central Bank of Russia reacted by increase of key interest rate, which have been holding on at 11% since August 2015 till nowadays. Main priority of Russian government of 2016 was managing to hold the budget deficit under the 3% target of GDP. At the end of 2016 - beginning of 2017 fiscal and monetary authorities in Russia are focusing on the mid-term goal to keep inflation on 4% in 2017. Clearly, taking into account current economic condition and recent crisis, development of bioethanol and biodiesel production has paid even less attention from the government nowadays (USDA, 2016).

One of the many barriers that historically have been hinder biofuel development is strong oil and gas lobby, which productively cooperate with Russian government. The main obstacle for the development of biofuel's sector in Russia is considered significant lack of coherent policy and regulation. Creation of healthy biofuel's sector requires authorities to found a new governing body, owning adequate rights, staffed with qualified personnel and resistant to the external influence. In order to reduce the uncertainty in biofuels sphere, the government should sign up for sustained long-term policy commitment and clarify the energy strategy. These actions will bring confidence in investments into sector of biofuels and motivate the growth within industry. Until the proposed incentives are not established on the legal base, the progress in the sector of biofuels is not possible. In conclusion: according to experts, even in case of the growing support from the government, the rapid flourishing of the

sector is not expected. And biofuel production in Russia will be not fully developed in the next decade (USDA, 2016; personal interview).

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