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Biofuels Annual

Biofuels Sector Update

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Report Highlights:
As one of the world's leading producers and exporters of oil and gas, biofuels have an insignificant share in the overall energy production matrix of Russia, with an estimate of only 1.2 percent, and biomass accounting for only 0.5 percent. Any growth of ethanol production will be driven primary by demand from the chemical industry rather than fuel production. Russia is unlikely to develop ethanol for fuel until the GOR has taken serious steps toward supporting the industry by developing the regulatory base and policy measures to support local producers. Wood pellet production will likely continue to grow, driven primarily by increasing demand from Europe.

Post:
Moscow

Executive Summary

The Russian government has outlined as a national objective the goal of Russia becoming 40 percent more energy-efficiency by 2020. While there have been previous attempts at the federal level to promote the production of biofuels, there are also a small but increasing number of activities at the regional level. The number of innovative projects aimed at production of alternative energies has increased in the past years, such as those from plant cellulose (including wood or oilseeds) and agricultural wastes, along with production of biofuel raw materials for export (including fuel pellets, rapeseeds, and rapeseed oil). The emerging Russian biofuels industry's export orientation is driven by continued growing demand from Europe and Asia. However, the production of biofuels still remains small and has almost no impact on Russia's overall domestic grain and oilseed prices.

Due to its abundance of petroleum and natural gas, Russia produces a very small amount of biofuels and has minimal domestic demand. According to industry experts, Russian biofuel production will not be fully developed in the next 10 years, as the sector is not considered as a national priority. Different sources estimate that renewable energies, including biofuel, represent 1.2 percent of Russia's total energy production, with biomass consisting 0.5 percent. While there are no official statistics that measure what share of total energy production biofuels account for, it is estimated that biofuels make up 5 percent of Russia's heating energy and 1 percent of its electrical power.

The Russian Ministry of Energy reports that the volume of technically accessible renewable sources of energy in Russia is estimated at 24 Btoe. The share of electricity generated by renewable sources accounts for only 1 percent, while the share of thermal energy generated from renewable resources represents 5 percent or 3000 million Gcal. At present, Russia utilizes only 20 percent of its economically viable hydro-energetic resources.

The Russian Ministry of Energy also reports that there are no government-backed biofuel projects in operation at this time. The majority of biofuel ventures in Russia are supported by regional governments or financed by foreign investors. In most circumstances these projects are in the pilot phase and produce just enough biofuel to generate heat/electricity for their own facility, or for the production of organic fertilizer from agricultural waste. Currently, there is no industrial production of either bioethanol or biodiesel in Russia, except for several facilities that are operating in the regions and are supported by the regional administration or private companies.

Oil and Gas Sector

Russia's abundant resources of petroleum and natural gas (and subsidized natural gas prices) have removed most incentives for both more efficient use of fuel and development of alternative energy sources. Russia has 34 percent of world petroleum resources and 13 percent of natural gas. According to the Ministry of Energy, in 2012 Russia produced 518 MMT of oil, an increase of 1.3 percent versus 2011, and the highest production since the collapse of the Soviet Union. International prices for oil and gas remain high, and as the largest exporter of crude oil and gas, there is little interest in developing the domestic biofuels industry.

In 2008 the Government of Russia (GOR) adopted the Technical Regulation on Fuels. In 2011, the GOR amended the document in reference to the requirements for gasoline, diesel, shipping diesel, jet fuel and residual oil, and stipulates a smooth, by-stage, transfer to production of oil products that will comply with world ecological standards.

In 2012, the highest rate of growth in petroleum production in Russia occurred in Eastern Siberia and Far East as well as European zone. The growth is the result of using modern technology in petroleum production. The most increase in production occurred by vertically integrated companies, which saw an increase in production of 12 percent.

The following reasons are attributed to increasing petroleum production in Russia in 2012:

- Advantageous tariff tax policy for new perspective oil fields located in the Arctic part of continental shelf, eastern Siberia and the Far East;

- Advantageous tariff tax policy for oil fields with more than 5 MMT production capacities;

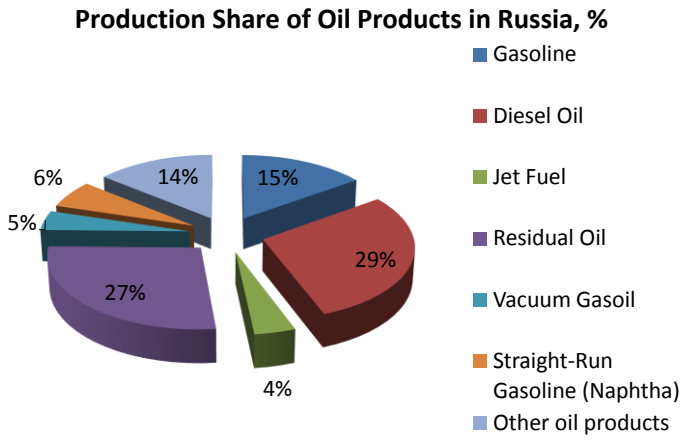
- Improving logistical infrastructure around new oil fields in the Far East and eastern Siberia;

- Continued high international prices for domestic oil.

Russia's oil processing sector has shown stable growth in 2012 in all types of petroleum products except for diesel oil. The total production for processed oil products is estimated at 270 MMT, including gas condensate. It is an 11.4 percent increase in comparison with 2011. The processing rate (depth) has also gone up from 70.6 percent in 2011 to 71.2 percent in 2012. Continued economic growth in Russia facilitated growing demand for all types of oil in the domestic market.

According to official statistics, in 2012 gasoline consumption increased by 4 percent and reached 35.1 MMT, jet oil consumption reached 9 MMT, unchanged from 2011, consumption of residual (bunker) oil reached 23.7 MMT, an increase of 1.7 percent, and consumption of diesel fuel fell to 28.2 MMT, a 10.8 percent decline than in 2011.

Russian exports of oil and gas has been stable since 2011. In 2012, according to preliminary data of the official statistics, exports of raw petroleum is estimated at 210 MMT and exports of oil products at 110 MMT. Natural gas exports in 2012 were also relatively stable and estimated at 108 billion cubic meters, slightly down from 2011.



Source: Ministry of Energy of the Russian Federation

Policy and Programs

Russia is still in the developing stage of establishing regulatory norms for bio-energy development and standards for biofuels. Trade sources indicate that without government support and other development policy measures the sector is unlikely to develop.

Currently the development of the Russian bioenergy industry is outlined in two basic documents:

1) Energy Strategy of Russia until 2030 (approved by Government resolution #1715-P dated November 30, 2009);
2) Federal Program of the Russian Federation "Energy savings and increasing efficiency for electrical power generation until 2020" (approved by Government resolution #2446-P).

In 2012, the government made efforts to improve regulations relating to bioenergy, specifically related to production of renewable resource for generation electrical power and development of biotechnology.

In April 2012, Russia adopted the Comprehensive Program on Development of Biotechnology through 2020 (BIO 2020). The program envisages development of different branches of biotechnology, and classifies biofuels as one of these branches. The Program states the following targeted indicators for the development of bioenergy sector in Russia by 2020:

- 10 percent bioenergy share in generation of thermal power;
- 10 percent biofuels share in motor oil;
- 90 percent of fuel and energy facilities will use biodegradable sorbents for cleaning pollution from surface waters;

- 30 percent of utilization of solid household wastes and 90 percent utilization of wastes from poultry production;
- 20 percent share of solid biofuels in the European market;
- 5 percent share of the world market of motor biofuels and its components;
-

Note: for more information on the Program BIO 2020 see GAIN report Program on Development of Biotechnology in Russia through 2020_Moscow_Russian Federation_6-7-2012.doc

The Russian Government is also discussing a draft program on modernization of electrical energy thru 2020. The Program outlined as its objective to make Russia 40 percent more energy-efficient by 2020 and to develop different types of renewable resources for electricity generation, including wind power station, electricity station on biomass, and small hydro power stations. This program's objective is to construct facilities with biomass utilization that by 2020 will generate 580 MWh electrical powers; and biogas facilities for generation 330 MWh. Experts from the Ministry of Energy estimate the potential market for renewable resources in Russia at $20 billion.

Most specialists believe that the Russian government may not achieve its renewable fuel/alternative energy potential by 2020 for the following reasons:

- Higher construction costs of facilities producing alternative energy in comparison with fuel-burning power plants. The equipment for facilities producing alternative energy is imported (up to 80 percent) as domestic equipment production lags behind.
- Domestic electricity network is not adapted to support operation of the facilities for alternative energy.
- Lack of financial support from the federal government. The government is focused on developing programs for energy efficiency rather than biofuels.
- There are no official statistics in Russia on bioethanol and biodiesel production, consumption and trade. However, different sources estimate the share of biofuels production in overall energy production matrix of Russia at 1.2 percent.

A GOR resolution dated October 4, 2012 # 1839-P approved measures to try and stimulate production of electrical power by facilities that use renewable resources. The new resolution indicates a number of measures that are aimed at improving electrical power originating from renewable sources. Specifically, the measures include:

- Approved differentials on targeted indicators on each type of renewable resources;
- Improved procedure for formation of renewable resources scheme;
- Simplified registration procedure the facilities that operate on renewable resources;
- Approved methodology for calculation tariffs for electricity.

However, according to recent rules approved by the Government, in May 2013 the system of government financial support will be extended only to facilities operating on sun, wind and hydro. Both facilities of biomass and biogas will not get financial support at least until 2020 from the federal budget, since the Government feels that these technologies have not progress to an industrial scale yet, and as a

result these support mechanisms would not be effective yet. This approach will make Russia fall even further behind in stimulating the biofuel sector as well as innovative technologies.

Future objectives for the gas and oil sectors are outlined in the Energy Strategy of Russia until 2030. The priority objective is modernization and reconstruction of the oil processing sector by increasing the processing rate (depth) of crude oil from 75 percent in 2010 to 80 percent by 2020. The document stipulates that this is the major condition that will allow transfer the industry into a new technical level and will be able to supply Russia with local high quality oil including diesel, gasoline lubricants and other products for oil chemistry industry. The increasing efficiency in processing oil will allow an increase in exports of motor oils by 20 percent by 2020.

The Energy Strategy also foresees an increase in production of oil products from the current 200-210 MMT to 210-235 MMT by 2020. The Strategy has an increase in production of gasoline, diesel and jet fuel from 110 MMT up to 130 MMT by 2020.

The Energy Strategy also foresees a number of measures and targets for developing gas industry. The priority for the government includes developing infrastructure and competition in the local markets, support to development of independent gas producers, as well as cautious approach to rising prices for gas and developing law and regulation in the gas sector.

Russia is also working on developing its Transport Strategy until 2030. This Transport Strategy establishes the objectives and priorities in development of transport sphere in Russia as well as programs and financial support. According to the Transport Strategy, in 2012 the length of total railway roads in Russia is reported at 86,000 km, 903,000 km of automobile roads, 101,000 internal water roads, 2500 km of tramp roads, 485 km of metro roads, 4800 km of trolley toad, 639,000 km air ways, including 468,000 km of international air ways.

Rail road transport carries out 12 percent of total freight traffic and its share in total cargo turnover is 82 percent. In 2011, the number of passenger vehicles reached 36.4 million units which represent a 79 percent increase since 2000. In the same time frame the passenger transportation by public transport has decreased by 42 percent.

Fuel Use Projections (MMT)									
Calendar Year	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Gasoline Total	38	40	41	40	41	42	44	47	48
Diesel Total	37	34	37	39	39	41	43	47	47
On-road	5	5	6	6	7	7	9	10	11
Agriculture	5.5	5.2	5.8	6.2	6	6.3	7	7.4	7.5
Construction/mining	4.8	4.5	5.1	5.8	5.8	6	6	6.4	6.5
Shipping/rail	10	8	9.6	9.2	9	9	9	9.5	9
Industry	5.3	5	5.5	5.6	5.8	6	6	6.2	5.7
Heating	6.4	6.3	7	6.2	5.4	6.7	6	7.5	7.3
Jet Fuel Total	11	11	15	17	18	20	21	22	24
Total Fuel Markets	86	85	93	96	98	103	108	116	119

Source: Rosstat (Russian Federal Statistical Service), Russian Ministry of Energy, Russian Ministry of Transport, Industrial Union "Energy Efficiency and Savings".

Bioethanol/Biodiesel Projects

Some industry analysts believe that bioethanol and biodiesel in Russia could become profitable in Russia if the government exempts production from excise taxes. However, this is not a priority for the government and some attribute this to the strong influence of the oil industry.

Industry analysts also attribute the limited presence of bioethanol in Russia to high wheat and grain prices worldwide, which makes biofuel production less profitable. Currently, Federal biofuels policy is not under the National Agricultural Priority Project. With the lack of government support, the sector is unlikely to develop. The major reasons for the government lack of interest include: high cost of biodiesel; inadequate regulations pertaining to the sector; limited domestic demand; higher availability of alternative energy sources and poor infrastructure (in particular machinery) that cannot be adapted easily to biodiesel use.

In 2012, the Ministry of Agriculture and Natural Resources and Ecology backed only one bioethanol venture. A new project producing ethyl-tru-propyl-carbinol ester (fuel additive which is created from grain and fodder wastes) started operations in Omsk oblast in April 2013. The project, initiated by the Center of Innovation and the Group of Companies-Titan, was financed by the VneshEconomBank at 235 million Euros. The plant is projected to use 750,000 MT of grain by-products and fodder annually, and produce 330,000 MT fuel additives. The facility was constructed in close proximity to a cattle production farm and grain processing plant, so that grain by-products and fodder from these facilities could be used as an ecological additive agent. According to sources at the Ministry of Agriculture, although the ecological additive agent has good potential in both the domestic and European markets, it may take up to 10 years before it is produced on a larger scale in Russia.

There is also vast potential for exploiting agricultural waste in Russia. However, there are only a few modern agricultural plants that can utilize agricultural waste efficiently. Experts estimate total annual

agricultural waste in Russia at 640 million MT which is equivalent to 80 Mtoe. The programs for agricultural waste are supported by the regional budgets. Most of the resources could be used for biofuel production or be exported. However, to date, no government programs exist that would entice producers to utilize these wastes. For example, in the Southern Federal district only, the annual production of straw is estimated at 25 MMT, from which only 10 MMT is being utilized, the remaining straw is wasted. Roughly 12 MMT of fuel pellets could have been produced out of this straw.

Ethanol Used as Fuel and Other Industrial Chemicals, 1,000 Liters									
Calendar Year	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Beginning Stocks		0	0	0	0	0	0	0	0
Fuel Begin Stocks		0	0	0	0	0	0	0	0
Production	63,500	63,000	72,000	71,000	68,340	80,000	85,000	89,500	93,000
Fuel Production	0	0	0	0	0	0	0	1	2
Imports	0	0	0	0	0	0	0	0	0
Fuel Imports									
Exports	14,000	15,000	26,000	25,860	22,340	32,890	39,680	43,000	44,500
Fuel Exports	0	0	0	0	0	0	0	0	0
Consumption	49,500	48,000	46,000	45,140	46,000	47,110	45,400	46,500	48,500
Fuel Consumption									
Ending Stocks		0	0	0	0	0	0	0	0
Fuel Ending Stocks		0	0	0	0	0	0	0	0
Production Capacity									
Number of Refineries	3	3	3	4	4	4	4	6	7
Nameplate Capacity									
Capacity Use (%)									
Co-product Production (1,000 MT)									
Wheat by-products								750	870
Feedstock Use (1,000 MT)									
Grain								2,400	2,780

Source: Rosstat (Russian Federal Statistical Service), Russian Customs Committee, trade sources, Information Agency "Credinform".

The denaturated (technical) ethanol industry is mostly concentrated in the Volga Valley region in Russia. The JSC "Neftekhimia" company is the dominant producer of this product accounting for more than 90 percent of overall denaturated ethanol production in Russia. Russia is self-sufficient in the production of denatured ethanol and exports account for about 40 percent of production. The major destination markets of Ethyl Alcohol, denaturated , of an alcoholic strength by volume of 80 percent (HTS220710) is Turkey at 5.6 million liters, followed by Lithuania, almost 10 million liters. Finland is Russia's number one export market for Ethyl Alcohol denatured of any strength (HTS 220720),

accounting for 36 million liters. Analysts report that the production will continue to experience a stable growth in the mid-term as a result of strong demand from Europe and Baltic Republics. The growth of ethanol production in Russia will be driven primarily by the demand of the chemical industry rather than for fuel production. Russia is unlikely to develop ethanol for fuel until the GOR has taken steps to support the industry by developing a regulatory base and policy measures to support local producers.

Biomass

The government of Russia has identified the development of Russia's domestic forestry sector as a necessity, and production within this sector is expected to substantially increase by 2020. While not a priority, the Federal Forestry Agency considers biomass production as the main alternative for Russia's developing biofuel sector. Russia has huge potential for biomass production, however, due to the large supply of high-value fossil fuels, only large wood processing facilities are interested in the commercial production of biomass.

Currently, biofuel production from biomass is estimated at 3 MMT in crude oil equivalent. Industry experts believe that it is feasible to increase this amount tenfold, if the government identifies the sector as a priority and includes biomass in the National Energy Strategy. Industry experts also agree that individual regional plans aimed at increasing biofuel production should be considered. The only significant biomass factory is the thermal electricity station "Beliy Ruchey" operating in Vologda oblast. Its energy capacity is estimated at 6 MWh. The local administration in Komi Republic is supportive of biomass development projects. In 2013, International Co. Metso is reportedly supplying technological equipment for wood waste utilization to a processing facility in Syktyvkar. The project will start operating in 2014. The capacity of the electrical station is 4 MWh per year.

The total annual volume of wood waste in Russia is estimated at 20-30 MMT, which is equivalent to 15-20 toe. The Federal Forestry Agency estimates the total annual growth of natural forestry in Russia at 920-950 million cubic meters. At present, only 186 million cubic meters are being used in biomass production, while more than 700 million cubic meters are unused, accounting for 250 MMT of wood pellet and wood chips. Today, the majority of wood waste occurs due to limited access to special equipment and modern technologies, as well as a lack of interest from the Russian government and foreign investors.

Biogas

Currently, there is no government program to stimulate construction of biogas facilities in Russia. The construction of smaller biogas facilities is also insignificant. So far there are two major biogas facilities in operation in Russia. The first biogas station in Russia has been in operation since 2009 in Kaluga oblast. The project was started by BioPotok and BioGasEnergoStroy in cooperation with the Netherlands. The biogas station is located next to a dairy farm with 1,000 head of cattle. The thermal power capacity is 300 KWh /hour and electrical capacity is 200 KWh/hour.

In 2011, BiogasEnergoStroy signed agreements in 27 different regions – including Belgorod, Voronezh, Orlov, Rostov among others – stipulating the construction of an additional 30 bioenergy stations that would use agricultural waste. The planned energy capacity of these stations varies from 350 KWatt to 10 MWatt, with total capacity equaling 120 MWh. BiogasEnergoStroy will finance 50 percent of the

total cost of these stations and the remaining expenses will be covered by Landesbank Berlin AG, Germany. The bank has signed the agreement with BiogasEnergoStroy with intention to finance biogas projects for total amount of 750 million Euros. Currently, there are 2 biogas stations operating in Belgorod oblast. The investments are estimated at 25-30 million Euros. Belgorod is one of the leading regions in swine production with a large amount of agricultural wastes. Another biogas station is located in Belgorod oblast with energy capacity of 2.4 MWh. The project is implemented by AltEnergo company.

Wood Pellets

The growing interest from the European Union for biofuel, particularly wood pellets, will continue to be the major incentive for Russia to increase production of wood pellets. Currently, Russia is the second largest exporter of wood pellets to the EU after Canada. Recently, the European Union (EU) announced that the amount of renewable energy sources used in the production of electricity will increase to 15 percent by 2025, triggering substantial near-term growth in the global pellet market. Trade experts estimated that demand for wood pellets in the EU by 2020 will double and forecast at 24 MMT annually, including 11 MMT will be imported annually. Experts estimate the current world market capacity for wood pellets at 15 MMT. This number is expected to reach 45 MMT by 2020.

According to Rosstat (Russian Federal Statistical Service), Russia produced 460,000 MT of wood pellets in 2012, a 17 percent increase from 2011. Most analysts, however, believe that actual wood pellet production is at least three to four times higher than the official data. The number of processing wood pellets facilities in Russia, however, have been shrinking recently. Trade sources report that the number of processing facilities in Russia in 2010 was 150. However, in 2013 the number of wood pellet processing facilities companies has decreased to 60 with a high degree of consolidation. It is expected that larger businesses will absorb small wood pellet producing facilities as the latter are not economically feasible. Total annual production capacity is reported at approximately 2.5 to 3.0 MMT.

The majority of these facilities are located in the Northwest, Central and Volga regions of Russia. The top ten pellet production facilities have 92 percent share in the total Russia wood pellet industry. The largest pellet producer is Vyborgskaya Forest Corporation" (Vyborgskaya Lesnaya Korporatsiya) with annual production capacity at 900,000 MT or more than 50 percent of the total wood pellet production in Russia. The company exported 500,000 MT of wood pellets to Europe in 2012. Experts believe that the small and medium pellet processing facilities will be shrinking as they are not cost efficient for producing wood pellets for export, as well as the insignificant development of domestic boiler stations. The other large pellet producers are Biogran in Karelia, DOK "Yenisey" and "Novoyeninskiy forestry processing facility" in Krasnoyarsk kray. In Arkhangelsk region, pellets are produced Forestry facility "Lesozavod 25" and "Stod" in Tver region, In 2013, the production of wood pellets is expected to rise due mostly to strong EU demand and increasing local production, as well as the Russian government's call for increased efficiency in the forestry sector.

In the mid-term, domestic demand for wood pellets is forecast to increase at 10-20 percent annually. In the local market wood pellets are in demand by private heating stations and municipal housing, primarily in heavily forested areas where traditional sources of energy are not accessible. Production of wood pellets is, in most cases, cheaper than gas. However, lack of domestic standards for pellets, poor transport infrastructure, lack of warehouses, and the product's seasonality will all negatively impact the

wood pellet market's development in Russia.

Starting from 2012, Russia used a separate HS code for wood pellets only - HTS 440131. This will make tracking trade in wood pellets easier, as before that, wood pellets products were under HTS 440130, which also includes sawdust, wood waste and scraps, briquettes, pellets or similar forms. Russian Customs report exports of wood pellets from Russia in 2012 at 730,000 MT. The leading export destination for these products was Denmark at 302,000 MT, followed by Sweden at 221,000 MT, and South Korea at 50,000 MT. Europe will continue to be the largest importer of Russian wood pellets.

Near-term foreign demand for wood pellets is likely to increase by 10-15 percent. Some EU experts estimate that Russia's share of the EU's total 2012 import market of wood pellets is 16 percent. Russia has export potential and European pellet demand will likely stimulate an increase in Russian production. However, Russia will require large investments in order to upgrade its facilities and expand its production capacity. Domestic demand can also absorb some of the increased, near-term production.

Table 1. PS& D for Fuel Pellets

PS & D for Fuel Pellets						
1,000 Metric Tons						
CY	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Production	967	1,320	1,590	1,900	2,250	2,475
Imports	0	0	0	0	0	0
Exports	707	990	1,220	1,470	1,680	1,850
Consumption	260	330	370	430	480	510

Source: Rosstat (Russian Federal Statistical Service), Russian Customs Committee, Federal Forestry Agency, trade contacts, Forestry Forum "Green press".

Rapeseed Market

Russia's production of rapeseed oil in 2013 is forecast at 412,000 MT, almost the same as in MY 2012. Russia exports almost 50 percent of domestically produced rapeseed oil to Europe for use in biofuels. Growing EU demand and improved production infrasturute is expected to continue to drive increased rapeseed and rapeseed oil production in Russia.

Please refer to GAIN RS1318 Annual Oilseeds and Products for more details.

PS&D Rapeseed Oil, MY 2011-2013

	2011/2012	2012/2013	2013/2014
Crush (1000 MT)	955	1,060	1,050
Extr. Rate, 999.9999 (PERCENT)	0.39	0.39	0.39
Beginning Stocks (1000 MT)	12	20	48
Production (1000 MT)	374	416	412
MY Imports (1000 MT)	1	1	1

Total Supply (1000 MT)	387	437	461
MY Exports (1000 MT)	226	200	220
Industrial Dom. Cons. (1000 MT)	15	20	20
Food Use Dom. Cons. (1000 MT)	126	169	175
Total Dom. Cons. (1000 MT)	141	189	195
Ending Stocks (1000 MT)	20	48	46
Total Distribution (1000 MT)	387	437	461

Notes on Statistical Data

Bioethanol and biodiesel production in Russia is marginal. There are no official data for these products in Russia. Russian official statistics on fuel use by industry sectors are not available or differ from the data provided by trade sources and energy companies and corporations. FAS base/Moscow-based estimates fuel projections using a number of sources, including Ministry of Transport, Ministry of Energy, Industrial Union “Energy Efficiency and Savings”, as well as trade sources and media reports. Production and trade data for wood pellets is based on the Global Trade Atlas, Official Russian Federal Customs Service, and estimates of the FAS posts in EU. Trade data for wood pellets may not correspond to the EU data since Russia started to use a different HS Code for just wood pellets since 2012. Prior to that, it was subsumed under HS 440130. FAS/Moscow used data from the National Biofuels Association, sources from analytical institutions as well as agricultural trade sources.