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## Characteristics of Creation of the Wood Pellets Market in Russia

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*In the article the results of the conducted research of production and consumption of wood pellets in the world are given. The analysis of the wood pellets market in Russia is carried out and characteristics of its creation are recognized. The consumers groups of pellets are examined and variants of sale strategies for Russian produces are suggested. Future trends of production and consumption of wood pellets in Russia are determined, as well as possible measures of government support of the market.*

*Keywords: wood pellets, market, production, consumption, strategy, pellets plants, government support.*

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### Introduction

During the last 20 years the amount of wood used for energy has been increased. According to the JWEE Report (Steierer, 2007), the volume of consumption of wood for energy generation in Europe and North America is greatly higher than reported by official international statistics. Use of wood pellets as a fuel in stoves and kilns in households, and also for energy receiving in thermoelectric power stations had a stunning success in developed countries for the last decade. From the end of 1990s, when increased interest in pellets was limited by several European markets (Sweden, Denmark, Austria, Germany and Italy), sales of heating equipment for pellets at these countries have been raised, in average, from 30% to 50% yearly during the decade. The

key characteristic of the world pellets market is becoming a globalization.

In 2006 rapid growth took place in the European pellets market, and experts of the UNECE European Economic Commission connected it with the active government support and the record oil price level for the last 25 years (*Forest Products...*, 2007). In spite of slowing down of the market's growth rate in 2007, it is expected that the sharp raising of activity in the pellets market will occurred within the next three years.

Creation of the Russian wood pellets market is being a subject of great interest of wood enterprises, because pellets production allows to utilize wood wastes and to get a profit out of them (especially from export sales). At the same time future trends of this industry is not understood

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clearly. On the one hand, the situation on the world pellets market is favorable and good conditions for Russian producers are created. From the other hand, in 2007 year several prominent Russian pellets plants were almost closed because of their unprofitability.

Thus, in the present research the analysis of the existent state of the wood pellets market is fulfilled and its future trends are determined, as well as estimation of product organization in this sector for Russian enterprises is conducted.

### **Description of wood pellets**

Wood pellets are small cylindrical presswork of wood with diameter of 4-10mm, length of 20-50mm, altered from dried residues of timber industry (sawdust, shavings, bark, knots etc.). Wood pellets are being made without any chemical fixings under high pressure. The moisture of raw materials before pressing must be no more than 10-12%.

Pellet heating systems provide a low-net CO<sub>2</sub> solution, because the quantity of CO<sub>2</sub> emitted during combustion is equal to the CO<sub>2</sub> absorbed by the tree during its growth.

The energy content of wood pellets is approximately 4.8 MWh/ton.

The production of wood pellets is considered as one of the most effective way of utilization of small wood wastes and bark. Advantages of wood pellets in comparison with technologies of direct incineration of sawdust, wood chips and old wood are the following:

- wood pellets generate more energy, making the performance index of boiler-rooms higher;
- wood pellets are clean and CO<sub>2</sub>-neutral;
- every 2.2 tones of used pellets prevents 1,000 liters of oil being burnt, saving approximately 2 tones of CO<sub>2</sub>;
- large storage platforms for wood pellets are not required;
- spontaneous combustion of wood pellets is excluded.

At present the Russian standard on wood pellets does not exist. While exporting wood pellets, Russian producers use standards of European countries. The main things taken into account by foreign consumers are: dimensions, ash level and abrasion.

The most commonly used national standards are: Austria - ONORM M 7135 Austrian Association pellets (briquettes and pellets); Germany - DIN 51731 (briquettes and pellets), DIN plus; England - The British BioGen Code of Practice for biofuel (pellets); USA - Standard Regulations & Standards for Pellets in the US: The PFI (pellets); Switzerland - SN 166000 (briquettes and pellets); Sweden - SS 187120 (pellets).

### **Production and consumption of wood pellets in the world**

In 2007 the world's wood pellets production came to 9 million tones. Its growth is continuing in 2008 owing to the price advantage of pellets which is amounting more than 50% in comparison with fuel oil. Up to 2010 the rising of the production volume till 15 million tones is expected (Fig.1).

The centre of the world's pellets production is Europe with the production volume of wood pellets forming 75% of the world market.

Sweden, Canada and USA are the biggest producers of wood pellets in the world with the total production volume of 3.5 million tones in 2006. According to estimations of foreign experts (*Global Wood Pellets...*, 2007), Sweden is expected to remain the leader in the wood pellets production within the next few years.

The second group of countries is formed from countries with the production volumes from 200 thousand to 600 thousand tones in 2006. It includes Austria, Germany, Russia, Lithuania, Finland, Italy, Estonia, Poland and Denmark.

Other countries produce much less volumes of wood pellets.

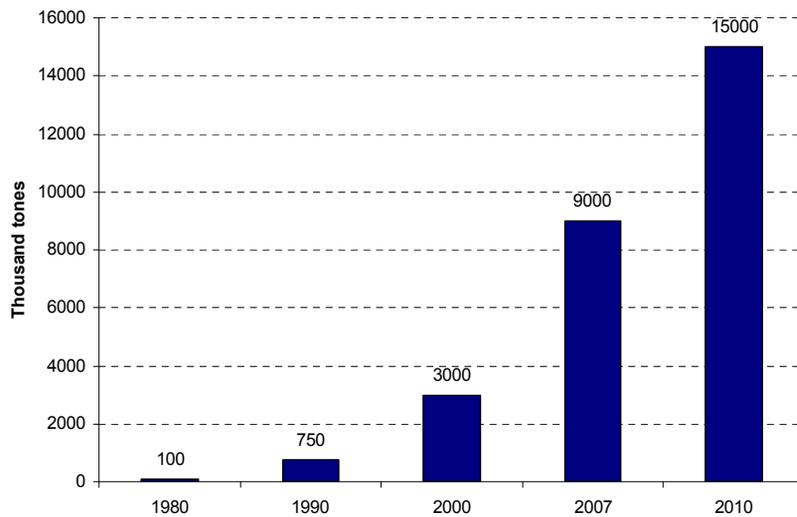


Fig. 1 World's wood pellets production volumes in 1980-2010s

There are considerable prerequisites for the growth of wood pellets use in developed countries, especially in Europe. The increase of use of wood wastes in industrial production of heat energy in Europe, Scandinavian countries and North America at 15-20% yearly shows the urgency of wood pellets.

As predicted (*Forest Products...*, 2007), the consumption of wood pellets in countries of European Union will exceed 5 million tones in 2010 (Fig. 2), whereas the production in these countries will be at the level of 3.3 million tones.

The world leaders of the wood pellets consumption are Sweden and the Netherlands. The large perspective markets are mainly situated in Denmark, Italy, Austria, Germany, Finland and Belgium.

The structure of the European wood pellets market consists of wholesale market, large boiler-rooms and thermoelectric power stations, municipal boiler-rooms and boiler-rooms of industrial plants, and also private households. It is in common practice to use wood pellets in big district boiler-rooms which used coal before.

As the world wood pellets market has been formed recently, its impetuous growth led to several problems which are typical for inceptive

markets: quality problems, lack of knowledge of technologies, appearance of swindlers and insufficient clarity of the market. In contrast to other renewable energy sources such as wind or sun pellets business collides not only with questions of equipment sales, but also with creation of difficult logistic systems that provide large geographical regions for fuel.

Strong growth surely could be expected with the political support of European Union, which plays the main role in expansion of pellets business to new European markets. The pretentious target of EU countries consisted in receiving of 20% of renewable energy till the end of 2020 is impossible without drawn politics concerning development of renewable energy heating. Besides, growing oil prices and the plan of reduction of CO<sub>2</sub> emission have positive impact on the pellets market's development.

Developed countries have serious political drivers directed to the development of pellets markets and they are differing depending on a region:

- In Europe an anxiety about the climate change and plans of realization of projects on renewable energy are dominating factors especially in the area of fuel incineration in the

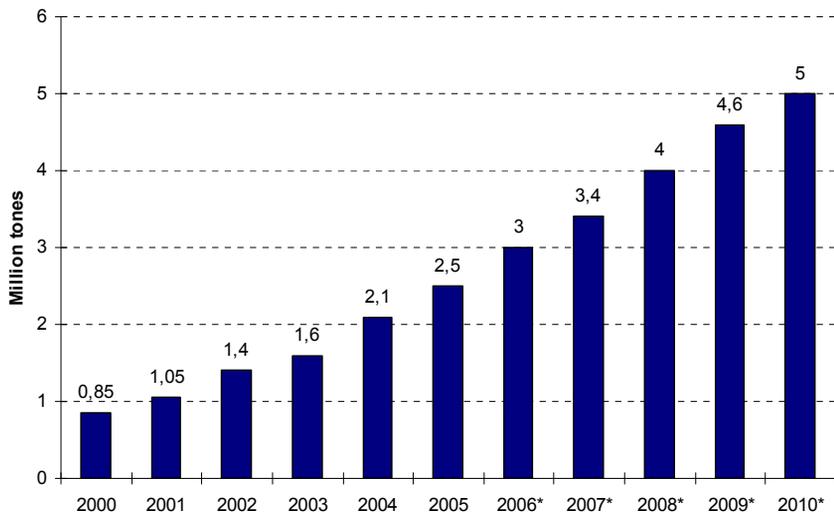


Fig. 2. The consumption of wood pellets in countries of European Union in 2000-2010s

large-scale industry. For pellets use in small heating systems the important factor is the price advantage in comparison with black oil.

- In North America the competitive price is the prevalent factor of development of wood pellets market as well as desire for the diversification of fuels store.

- For Asia the wide need in new energy sources and the transference from very polluting technologies to technologies reducing of CO<sub>2</sub> emission could be the most important drivers for increase of the wood pellets consumption.

- The development of some pellets markets mainly depends on potential export capacity – they are Baltic countries (Estonia, Latvia, Lithuania), Finland, Russia, Poland and Canada. In all of these countries the low level of sales at home markets is observed.

- According to the Kyoto Protocol, use of biomass as an energy gives a credit to the consumer and not to the producer of fuel. Therefore, Sweden, Italy, Denmark and other industrial countries are very interested in pellets import.

- Rising markets are appeared in Latin America. Pellets production in this region is lightly developed, but European need in pellets

could initiate investment into Latin America in the near future.

#### **Production of wood pellets in Russia**

In Russia the development of the wood pellets market takes place from the beginning of the XXI century against a background of revival of economic situation, improvement of common weal and active expansion of pellets use around the world.

Active development of wood pellets production in Russia took place in 2005-2006, but in 2007 the growth rate became slowly. In the first quarter of 2008 there were no any fundamental changes in the market. The consistency of the market development in Russia is given below.

2001 – Building of the first pellets plant not far from St. Petersburg: a small experimental production, which does not work at present.

2002 – Start of another 2-3 pellets plants in Leningrad oblast and Murom city. Rise of interest to the new industry by timber merchants.

2003 – Presence of 6-7 working plants in the Northwestern Federal okrug of Russia. Registration of the Russian Bio-fuel Association, the beginning of proactive interaction with some foreign consumers of wood pellets and market

entry of European suppliers of equipment for pellets production took place. The exports volume of wood pellets from Russia was amounted 8 thousand tones.

2004 – Extension of working pellets plants with the total amount of 15-25 thousand tones, oriented to export in countries of Western Europe. The production is focused in the Northwestern region.

2005 – Active creation of the wood pellets market in different regions of Russia. At the end of the year there are 28-30 working producers of wood pellets; 3-4 trade companies being engaged in buying up and realization of pellets abroad; branch magazine; branch reference book; a number of particularized conferences devoted to technologies of production and firing of pellets and to the market development.

2006 – Increase in the number of pellets producers and actual production volumes: about 60 pellets plants and 122 thousand tones of production. The growth of a number of domestic producers of pellets equipment and its supply in CIS countries is indicated. Several projects are financed from the federal budget.

2007 – A number of pellets plants in Leningrad oblast are on the verge of bankruptcy because of lack of raw materials for pellets production and competition for them from the direction of woodworking enterprises and pulp and paper mills, and also because of warm winter of 2006-2007 in Europe. At the same time the growth of production volume of pellets is still remaining owing to opening of the new pellets plants in different regions of Russia.

At present there are more than 100 producers of wood pellets in Russia and the half of them is situated in the Northwestern region.

Irrefutable advantages of allocation of the pellets production in the Northwestern region are: availability of plentiful forest resources and proximity to the main European markets

and ports. In a number of districts and republics of the Northwestern Federal okrug there are functioning programs of transference of boiler-rooms to biofuel and programs of application of technologies of energy generating from wood to production.

Production volume of wood pellets was increasing three times more every year from 2003 to 2006 and it is consisted 300 thousand tones in 2007 (Fig. 3).

At the same time real production volumes are greatly lower than planned production capacities of existing pellets plants. Down level of use of production capacities is explained most of all by such factors as: lack of raw materials, introduced errors in projection and integration of production, lack of experience of equipment's exploiting and also different problems of market entry.

In my opinion within the nearest 3-5 years a process of amalgamation and absorption of pellets enterprises will be observed that will allow overcoming the difficulties with sale for produces. Under inessential increase of a number of pellets plants the gradual raising of the rate of production will occurred and the most plants will achieve the level of the planned production capacities.

Today in Russia there is a good basis for further development of the wood pellets market. Active creation of informational infrastructure of the industry takes place, in particular:

- several consulting centers are working, some of which gets the encouragement from European government and nongovernmental funds;
- seminars and conferences on bioenergetics have been hold yearly (for example, annual conference “The wood pellet: Russia and the world”);
- in the context of timber exhibitions the sections on biofuel have been appeared;
- particularized magazines, branch reference book on bioenergetics “Wood pellet” are published;

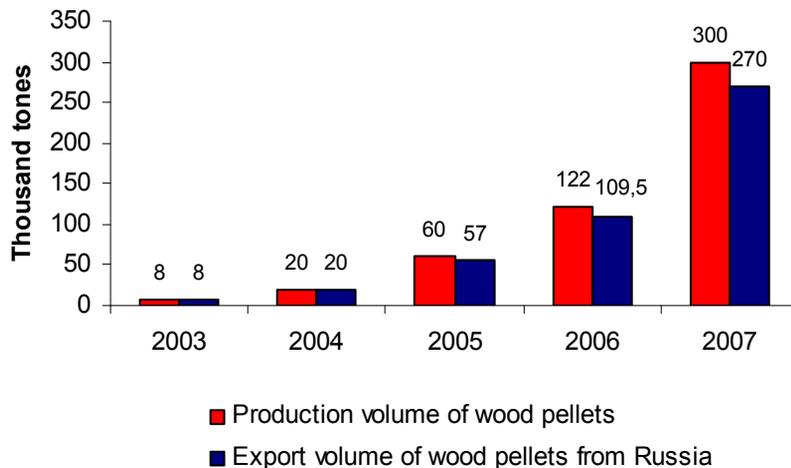


Fig. 3 The production and export volumes of wood pellets in Russia in 2003-2007s

- several nonprofit organizations of wood pellets market support are formed.

Besides, the work on creation of the Russian standard on solid biofuel is carrying out; certain efforts are making to lobby interests of the new industry in legislature and executive power. The conception of the Federal special program “Power-effective economics” in 2007-2010 and in prospect for 2015 year is elaborated. The document “Energy strategy of Russia in a period until 2020 year” was worked out but it is not accepted yet. In the State Duma the group on working out of the law on Small-scale Energy and groups on working out of laws for adaptation of mechanisms of the Kyoto Protocol are established.

### **Consumers markets of wood pellets for Russian producers**

The consumers market of wood pellets in Russia is on the stage of creation. Approximately 90% of pellets are exported.

#### *1. Home market*

The pawning of successful functioning of pellets plants in Russia is the development of the home consumers market. However at present the Russian consumers market is developed poorly. The main consumers of wood pellets are

own boiler-rooms of enterprises, private boiler-rooms in cottage settlements (predominantly in Leningrad oblast, S. Petersburg and Moscow) and a small number of utilities in forest regions.

Future trends of the home market are connected primarily with building of low-rise houses, especially of cottage settlements. Together with an increase of personal incomes of citizenry, there is an increase in the number of people with mean income buying country-houses. And owing to efforts of pellets producers and producers of pellets equipment there is a growth of awareness of population about advantages of pellets use in houses by fireplaces and boilers.

For private cottage wood pellets is the cheapest kind of fuel in comparison with firewood, mazut, coal, diesel engine and electric power. At the same time putting of a boiler on pellets could be cheaper than receiving of limits and gas supply. Among the industrial plants and public utilities an interest to use of wood pellets is growing. The would-be users of wood pellets in the home market are shown below.

1) Private sector near the metropolises or near the cities with a high level of income. Pellets boilers adjustable in private cottages are available in price for citizenry with the income above the average – their value is amounted in several

thousand euros. The tendency of income growth of population is still remaining, especially in the metropolises. Thus, in Leningrad oblast about 100 pellets boilers are setting yearly.

2) Detached buildings with a space up to several thousand square meters. Use of pellets boilers will be economically feasible if impossible to supply the gas for heating or in case of high value of connection to gas nets due to reduction of service costs, even in comparison with more cheaply coal. The pellets boiler has no need in permanent maintenance; it works in automatic mode of operation. It requires only a periodical supply with pellets and cleaning from ashes that could be fulfilled once in 2-3 weeks.

3) Cottage settlements with the central heating. Under conditions when there is no access to a gas-main or when such possibility exists, costs for connection to a gas pipe and mounting of a gas-main could achieve the amount higher than value of central pellets boiler-room. Under construction it allows reducing of investment costs into a heating infrastructure and increasing of business revenue performance because of sale of heat energy to population of the settlement on conditions that the boiler-room is contained in the ownership of the investor. The same could be referred also to tenement houses and high-rise buildings.

4) Substitution of boiler-rooms using the most expensive traditional kinds of fuel: diesel oil, fuel oil and even electrical energy by the boiler-rooms using wood pellets. Many boiler-rooms and heat power plants in Russia need urgent reconstruction because of deterioration and moral obsolescence of the equipment. At each of such object it is necessary to carry out the detailed analysis to define what kind of fuel should be used on it in future.

5) Separated federal and regional programs which allow financing, building, running and developing of wood pellets equipment. Wood

pellets are already arousing practical interest from the direction of local subdivisions and district administrations in a number of regions in Russia. Its use is particularly relevant in regions with absence of a gas heating.

At the home Russian market the groups of consumers are gradually forming on which pellets producers could be oriented in medium-term and long-term outlook. One of the most prospective trends of pellets use within the next few years is heating of the cottage settlements. The fact is that use of oil-burning boilers lowers quality of life in an ecologically clean place, so that advertising of pellets producers could be directed to the propaganda of ecological compatibility and convenience of pellets use for private needs.

In profitable regions where building of elite cottage settlements is realized (Moscow and Leningrad oblast etc.), it is advisable for producers to use *the strategy of the intensive marketing* - fixing of the high price and spending of large quantity of funds on the sale promotion. High price ensures a considerable profit and large energies on sale promotion allow quick penetration into the market. Such strategy will be advantageous if:

- the buyers as a whole are not informed of the goods;
- those who know the goods are ready to pay a high price;
- it is necessary to oppose to the competition and to form the preferable attitude to the goods among the potential buyers.

For the sale promotion it is effective to deliver the wood pellets as far as the place of destination and to give a flexible discount system. Methods of the goods promotion include: advertising in cottage settlements directly; allocation of advertisements in particularized newspapers and magazines on bioenergetics and timber industry; participation in exhibitions and conferences. It is relevant to create possibilities for consumers to

receive all needed information in the Internet, by telephone, fax and electronic mail.

In case of allocation of pellets plants near the sources of raw materials but far from European part of Russia, the production is directed to export of the goods. At the same time taking into account a gradual increase of pellets consumption in Russia, with the aim of a growth of production volumes, it is appropriate for producers to use *the strategy of the selective penetration* or *the strategy of the passive waiting*.

*The strategy of the selective penetration* supposes fixing of the high price on the goods and spending of low quantity of funds on the sale marketing. It could be profitable when:

- there is a small market capacity;
- the goods are well-known to the most of buyers;
- the buyers are ready to pay a high price for the goods;
- the competition is unimportant.

*The strategy of the passive waiting* means fixing a low price on the goods and low costs on sale promotion.

## 2. Foreign market

Until the home market is not being developed, the overwhelming majority of pellets plants will be as usual directed to European consumers. Thus, over a period of 2003-2007 exports volumes from Russia were increased almost in 30 times (Fig. 3).

The Northwestern federal okrug is the leader among the regions-senders of wood pellets – from its territory approximately 95% of wood pellets are sending. From the territory of the Central federal okrug 2% of wood pellets were sent in 2006, from the Southern federal okrug – 1%. The share of S. Petersburg and Leningrad oblast consists 88% of the whole exports volume of wood pellets.

According to the research (*Global Wood Pellets...*, 2007), Russia is one of the important

producers of wood pellets in the world after Sweden, Canada, USA, Austria and Germany.

Half of the exports volume from Russia is sending to Sweden and a tierce is exporting to Belgium. Exports sales from Russia are also supplying to the Netherlands, Italy – by 4%, Denmark – 3%, Germany – 1% and a number of other countries with a little share (Fig. 4).

In case of the competent forming of the business, Russian producers could reckon on steady sale of the wood pellets on the foreign market. At present in comparison with European producers, Russian pellets enterprises have the following advantages:

- relatively low price of raw materials for wood pellets;
- cheap energy supply;
- cheap labor force;
- low costs on construction.

At the same time, the logistics including conveyance of raw materials and delivery of the finished commodity severely reduces the most of advantages of the wood pellets production in Russia. Quality of the Russian wood pellets is also related to their disadvantages and yields to the European analogues because of low technological culture and low-grade wood stock.

When searching buyers of wood pellets on the foreign market, it is expedient for Russian producers to draw attention at the three following variants:

- 1) A dealer or a middleman acting at Russian market and presenting his own interests or the official interests of the large or middle wholesaler;
- 2) A foreign wholesale house laying in supplies for delivery of the wood pellets to buyers from its own warehouse;
- 3) An ultimate consumer of the wood pellets.

For the beginner producers of the wood pellets forming of a wholesale is the most

Table 1. Largest country - importers of the wood pellets from Russia in 2006

No.	Country-importers	Volume	
		Tones	%
	Sweden	55 704	51
	Belgium	37 445	34
	The Netherlands	4 706	4
	Italy	4 405	4
	Finland	3 057	3
	Germany	1 247	1

Table 2. Variants of the foreign market entry for Russian producers of the wood pellets

Variants of the market entry	Advantages	Disadvantages
Dealer (middleman)	Demand stability, there is no need to look for the consumers. Check audit for quality could be fulfilled at the site, before shipment.	The lowest price for producers because of giving a large share to middlemen. Guarantees are needed that the goods will be paid after the shipment.
Foreign wholesale house	The contract price is increasing and there are more guarantees of payment for the shipped goods.	There is a risk that the goods will be rejected at the consumer warehouse with the aim of reduction of the actually paid price.
Ultimate consumer	The highest price.	Small amounts to order, permanent changes in specifications of orders, irregular terms of the order. Late payment is possible because of the economic state of the consumer.

preferred variant. While independent entry into the foreign market for the retail it is important to observe all characteristics and segments of the potential market. Instruments of the market research are: exhibitions, statistic information of the trade delegates, and official statistics of competitors about their sales.

Russian exporters should realize that they enter the new market filled with the same goods. Therefore, it is recommended to fix the price at 20% lower than the current market average price. To increase the price will be possible after finding of the patrons if the producer proves his reliability in quality and in times of deliveries.

On the stage of application of the goods to the retail market *the strategy of the full-scale penetration* is the most appropriated. It implies a fixing of low price on the goods and active measures on sale promotion with the aim of

mass coverage of the market. As considered, the strategy of the full-scale penetration is the most successful for quick market penetration and for coverage of the maximum possible share. It is used, if:

- there is a large market capacity;
- the buyers are badly informed about the goods;
- high price is unacceptable for the majority of buyers;
- there is a strong competition;
- an increase of scale of the production reduces costs on the one article.

#### **Characteristics of the pellets business in Russia**

Among the beginner producers of the wood pellets there is a wide-spread opinion that a purchase of the modern equipment of the well-

known firm will ensure a success on the foreign market. The main errors in forming of the pellets production in Russia are:

- careful exploratory design is not fulfilled;
- typical process layout is used;
- mistakes in business-planning are committed (especially overpricing of pellets);
- non-optimal places for building of pellets plants are chosen.

The major criteria in decision-making about forming of the pellets business is availability of raw materials for production that includes: a potential quality of raw materials, their price at a producer's warehouse, quality of raw materials and competition for them.

In the absence of the own source of raw materials, competition for raw materials between pellets producers, pulp and paper mills and producers of MDF and wood chipboards could not be underestimated. The fact is that a quantity of wood wastes available for pellets production is not so large as usually declared, especially for plants in the Northwestern federal okrug.

In contrast to European countries when all raw materials are subjected to deep processing and as a result prime cost of the produced pellets from dried sawdust is rather low, in Russia only 20% of raw materials are subjected to deep processing. Thus, it is possible to provide with raw materials all pellets plants with capacity of 8-10 tones/hour under conditions that the plant will have a total technological cycle – it is a creation of the big mechanized exchange including barking of hungry wood, its pounding, drying, pressing, cooling, warehousing and delivery to consumers.

So, in the decision-making about forming of the pellets business the following factors should be taken into account, and each of them could have a considerable impact upon the prime cost of the wood pellets:

1) the place of location of the pellets plant influencing on the logistics of raw materials;

logistics of finished wood pellets and costs for energy supply;

2) availability and quality of raw materials;

3) qualified labor resources;

4) social and economic situation in the region.

Absence of the logistical base is seriously embarrassed the work of pellets plants. Costs for transportation for many enterprises consist about 40% of profit. Therefore, it is advisable to organize the pellets production on frontier territories, near ports and other transport ways.

The research is showing that within the nearest 2-3 years production of the wood pellets for sale will be profitable for large woodworking enterprises with the total technological cycle and a large quantity of wood wastes. By our calculations, business profitability consists 15-20%.

For small enterprises the best variant is a combination of the saw-mill and the line of the pellets production, because in this case the price of wood wastes is included in the cost of finished edge-surfaced lumbers that greatly reduces the prime cost of the pellets production.

For companies purchasing raw materials on the side, in my opinion, it is not advantageous to begin the pellets production within the nearest two years.

### **Future trends of the pellets market development in Russia**

As a result of the research it could be pointed that within the nearest 3-5 years a rapid development of production and consumption of wood pellets is not expected. Besides, the creation of the infrastructure and the increase of production volume will be continuing. Overwhelming majority of pellets enterprises will as usual directed to European consumers.

Growth of pellets consumption on the Russian market is connected first of all with

upward adjustment on gas and coal. At present, the barrier for increase of pellets price is the narrow circle of consumers, and in this connection many producers dispatch the goods with damages. At the same time in middle- and long-term outlook, separated consumers groups of the home market will be formed.

Some prerequisites of the development of the wood pellets market are already created in Russia:

1) Increase in the pellets production in Russia is associated with the development of woodworking industry that plays the important role in the Russian economy. According to the information of FAOSTAT (*Forest Products...*, 2007), the Russian share in the worldwide stock of forest resources is 23% (82.1 billion cubic meters). Stimulation of deep wood processing on the government level today will promote a growth of wood wastes and consequently a growth of available raw materials for the pellets production.

2) There are growing prices on oil, coal and gas. In spite of the fact that prices on coal and gas are still lower than on pellets, they are steadily increasing. During 2006-2007 years the increase of prices on coal and gas amounted 27% and 22% conformably, and within the nearest few years this tendency will be continuing. In this connection the popularity of wood pellets will also increase.

3) Because of irregularity of distribution of fossil fuel resources at the large Russian territory, they are delivered for long distances to supply regions having small stock of oil, gas and coal.

4) As the market of the equipment for biofuel's heating increases and the infrastructure of the biofuel market develops, the economic activities of boiler-rooms on fossil fuel and renewable fuel are gradually equalizing. Incineration of wood pellets in industrial scale for heating of private houses in many cases is more

profitable than incineration of coal, mazut and gas.

5) Subscription of the Kyoto Protocol by Russia and gradual application of mechanisms of trade of quotes on polluting gas emissions. These measures could ensure an additional inflow of financing into projects concerning transference of boiler-rooms and heat-electric generating stations on renewable energy resources within the nearest few years.

6) Growth of demand on wood pellets is expected with the increase of building volume of low-rise houses in Russia. At present at the house-building market there is a steady tendency of growth of individual apartment houses construction that corresponds with the worldwide trends. In period of 1990-2007 the volume of low-rise house-building has increased in 4 times, and its share in the total volume of introduced habitation increased from 10% to 43%.

At the same time there are rather serious barriers in Russia for development of the wood pellets market. They include the following:

1) *Legislative barrier.* Normative and legal basis in the sector of bioenergetics is still absent, and there are no drivers for transference to alternative sources of energy, formulated on the state level.

2) *Scientific and technical barrier.* The Russian standards on wood pellets are absent, there is a lack of scientific and technical and technological developments and a lack of knowledge about those innovation technologies which exist in the present sphere; a lack of specialists on bioenergetics.

3) *Technological barrier.* The fuel and energy complex in Russia is based on the use of organic fuel, and all industries are oriented to exactly this kind of energy resources. Low prices on traditional energy resources, first of all, gas and coal, in many Russian regions do not stimulate pellets consumption.

4) *Economic barrier.* There are low paying capacity of population and enterprises in Russia. First projects of pellets plants were realized inefficiently and existing pellets plants are working irregularly.

5) *Feed barrier.* As a result of low level of wood processing, an actual volume of wood wastes that could be used for the pellets production is much lower than potential. The potential amount of sawdust is also increasing because of the export of the large volume of round wood. Besides, today the growing competition for wood wastes exists between pellets plants, pulp and paper mills and board producers.

6) *Informational barrier.* Poor self-descriptiveness of population and managers of enterprises about possibilities and advantages given by using of wood pellets.

The immediate role for the development of the wood pellets market in Russia plays clear government policy relative to use of the alternative energy sources.

The experience of the developed countries demonstrates that the most important driver for the development of bioenergetics is the government support. As to Russia, the pellets market is forming spontaneously, under the initiative of private enterprises, and the main reasons for it development are: need for utilization of wood wastes, growing power inputs and prices on the traditional kinds of fuel, and also exports possibilities.

Interest of regional and municipal authorities to the wood pellets market was occurred only

the last two years; therefore it is too early to talk about the real means of its support. To the means of the government support of the pellets business could be applied the following:

- tax benefits for producers or consumers of the pellets;
- simplification of the bureaucratic procedures while realization of projects on bioenergetics;
- propaganda of energy-saving's ideas
- forming of training of technical and engineering employees and managerial staff in the field of bioenergetics;
- grants on the fulfillment of research engineering on bioenergetics etc.

Changing of the system of the budgeting of government boiler-rooms has a high profile, and it can initiate the realization of energy-saving and ecological measures from the direction of local authorities.

The carried out analysis of the state and the outlook of the development of the pellets production and consumption in Russia make its clear that the production of wood pellets at present could be viewed only from the standpoint of the effective utilization of wood wastes and not from the transference to alternative sources of energy. It is obvious that a private entrepreneur could not rely on the active government policy on bioenergetics within the nearest few years. Therefore, producers need to make a fundamental analysis of the advisability of business creation taking into account the specificity of the concrete enterprise.

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