

CURRENT STATE AND PROSPECTS OF THE USE OF WOOD FUEL IN BELARUS

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The Republic of Belarus consumes energy, on average a year, in the equivalent to 40 million tons of conventional fuel, and is provided with its own resources only for 15% (including: oil – 40%, wood fuel – 28%, peat – 16%, combustible gas – 6%, windpower and hydropower – 0,2%, other types of fuel – 9,8%). About 8,5 billion US dollars are spent for the purchase of missing energy carriers and the electric power in a year that is about 20% of import volume of the Republic and makes its economy dependent on external factors.

In structure of consumption of fuel and energy resources the share of one energy resource is great – namely natural gas (57,2% in fuel energy balance, 80% in the balance of boiler and furnace fuel and 97,2% in the fuel balance of power supply system) which is generally imported from Russia. In this regard the problem of diversification of the consumed energy resources and their suppliers becomes very actual for ensuring the energy security of the country. In the country the package of measures aimed at increasing the use of local types of fuel is constantly realized which also includes fossils and renewable energy mined in the territory of the Republic. Thanks to the measures taken, the share of own energy resources has increased from 16,8% to 26,4% in the balance of boiler and furnace fuel (BFF) during the last 8 years. Thus the share of renewable energy accounted for 8,3%. Wood fuel dominates in the structure of the used RES. This direction of the use of RES is less capital-intensive and more profitable now. However, Belarus doesn't stop on the reached results. So, the government of Belarus has set up the task to bring the share of local types of fuel in the balance of boiler and furnace fuel to 30% by 2015. In the achievement of these goals, the significant role is assigned to the use of low-quality wood and wood wastes for power purposes.

The forest fund of Belarus is about 45,4% of its territory or 9,43 million hectares. Percentage of forest land of the Republic of Belarus is 39,3% for 1.01.2014 and is the highest for the last 100 years. The general stock of plantings – 1,7 billion m³, including 81,3% for possible operation. According to official statistics, the share of forest complex in gross domestic product (GDP) is 4,2–4,5%. About 110 thousand people are involved in it (3,0% of the volume of employment in the national economy). Each inhabitant of Belarus takes about 0,98 hectares of the woods and 180 m³ of a wood stock that is almost twice higher than the level in Central Europe.

Yearly average, the gain of all forest stands in the Republic is 31,9 million m³. The preparation of wood in Belarus is 13,5-15,5 million m³ in recent years, including on the main consumption – 5-6,5 million m³, on intermediate consumption – 5,5 million m³, other cabins – 3-4,8 million m³. The volume of preparation of firewood is 5,6-5,7 million m³ in recent years. Thus the considerable part (about 3,6 million m³) of the prepared firewood is released to the population, budgetary organizations. Other 2 million m³ of firewood are used by boiler houses of communal services and by mini-combined heat and power plants for the production of thermal and electric energy. The average annual volume of preparation of wood fuel resources in the woods of the Republic of Belarus is 13,6 million m³. An average annual consumption by the population and the organizations as boiler and furnace fuel and for technological needs is about 8,2 million m³.

At this time, the industries based on production of chip are created in 50 state forestry organizations with a total power about 1250 thousand sq. of m³ a year. Thus, they have made 952 thousand sq. of m³ of chip in 2013. Besides, certain capacities for the production of fuel chip have been created at private enterprises. The average price of the fuel chip realized in the Republic is about 27 dollars of the USA / dense m³, and by delivery for export – 30 dollars of the USA / dense m³. The production of wood pellets and briquettes are engaged more than in

30 organizations of the republic. Total power of the operating productions is about 145 thousand tons per year. At the Belarusian State Technological University (BSTU) the complex of technologies and a number of domestic cars was developed for the preparation of the increasing volumes of wood and production of fuel chip. The family of wheel logging cars for cabins of the main and intermediate consumption was created together with RUP "Minsk Tractor Plant", among which are harvesters, forwarders, hook-on carts with manipulators, various skidders, and also chippers. The release of similar cars was also mastered by JSC "Amkodor". The distinctive feature of these cars is a wide use of import knots and processing equipment. With RUP "Minsk Automobile Plant" the lorry for transportation of chip was created, with the load of the flight about 80 bulk m³, and the dumper with removable containers with the load of the flight about 35-40 bulk m³.

The existence of domestic logging equipment with the foreign cars which are widely presented in the country, allows to realize a number of technological processes of logging with production of fuel chip in the conditions of cutting area, intermediate and interseasonal warehouses. However, the gained national experience shows that the technological process of production and shipping of the fuel chip to the consumer, developed in BSTU with the use of intermediate warehouse, has the greatest prevalence in natural working conditions of the country.

At this time, in the Republic of Belarus more than 3000 coppers with power from 0,012 to 20 MW work at wood fuel. Besides, 12 mini-combined heat and power plants work in the combined cycle of generating thermal and electric energy. In our republic we use local boilers (JSC "Belkotelomash", SOOO "Komkont", etc.), and import boilers. The construction of mini-combined heat and power plant was generally carried out with the use of boilers from "Biysk boiler plant", primary furnace of JSC "AXIS Industries" and steam-turbine installations of JSC "Energotekh" (Russia). Besides, at the number of mini-combined heat and power plants technologies of the Finnish company "Wartsila" and the Austrian company "Polytechnik" were used. A number of projects is realized with use of ORC modules and thermooil coppers. The prime cost of the generated electric power is 20% cheaper than at the development of the electricity from natural gas.

Over the last 10 years the competitiveness of wood fuel has been constantly changing. So, for example, the cost of firewood increased by 3,3 times for the analyzed time period, of sawdust – by 32 times, of fuel chip – by 3,5 times, of wood pellets and briquettes – by 2,2 times. At present time, in the Republic of Belarus firewood and fuel chip are competitive in comparison with fossil types of fuel. So, the cost of fuel chip is lower than the cost of natural gas for 31% in conditional expression.

For now, in the Republic of Belarus the new system of ensuring the power objects with wood fuel demanding resource and financial security is created. Domestic cars, equipment and technologies are developed, the most expedient forms of production organisation are chosen. Today all efforts are aimed at decreasing the cost of production of wood fuel and at increasing its competitiveness in relation to fossil types of fuel by the formation of the most effective systems of cars, optimization of an arrangement of warehouses and the solution of problems of logistics of delivery of fuel. The Belarusian experience shows that the realization of policy based on the increasing of use of wood fuel not only increases the energy security of the country, promotes import substitution, but also creates the considerable quantity of modern, high-efficiency workplaces, and allows to intensify the economy of regions, thereby increasing its competitiveness.

References:

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