

DEVELOPMENT OF WOOD PELLETS MARKET IN SOUTH EAST EUROPE

by

Branko D. GLAVONJIĆ^{a*}, Nike KRAJNC^b, and Hubert PALUS^c

^a Faculty of Forestry, University of Belgrade, Belgrade, Serbia

^b Slovenian Forestry Institute, Ljubljana, Slovenia

^c Department of Marketing, Trade and World Forestry, Technical University in Zvolen,
Zvolen, Slovakia

Original scientific paper

DOI: 10.2298/TSCI150213057G

The paper presents the results of researching wood pellets market in nine countries in South East Europe and Slovakia. Objective of the research was to observe the actual situation regarding the number of producers, size of installed capacities, production volume, foreign trade flows and existing problems, and obstacles which significantly limit the sustainable development of wood pellets market in the selected countries. Selection of such an objective results from the fact that according to the stated elements there are no sufficiently reliable data, wherefore this region is a huge gap in numerous reports of international and national organizations and institutions. Results of the conducted research show that in the middle of 2014, 245 producers were engaged in wood pellets production in South East Europe and Slovakia, 116 of which were located in Bulgaria and Serbia. Most of the producers of wood pellets has installed capacities of 1,000-5,000 tons annually, while only 18 factories in the entire region have the installed capacity over 30,000 tons per year. Observed collectively in all stated countries, the total installed capacities for wood pellets production were 2.2 million tons in 2013 and the realized production was 1.36 million tons. The largest part of the produced amounts of wood pellets in this region is exported. 1.06 million tons were exported from the region in 2013, which is 77.9% of the realized production. Such high export is the result of the underdevelopment of the local market (Slovenia is the only exception) and the problems which exist and limit its faster development in most countries.

Key words: wood pellets, capacities, production, export, market

Introduction

Wood pellets are the fuel with the fastest growing market in the last ten years both on the markets of individual countries and on the global market. Such market growth mostly results from the price increase of fossil fuels (especially light oil and heating oil), policy measures in the field of climate change mitigation and environment protection as well as the development of automated and highly efficient wood pellet burning appliances. All these together with the comfort enabled by the automation of burning process and significantly lower heating costs compared to light oil and heating oil has contributed to the strong development of production, trade, and con-

* Corresponding author; e-mail: branko.glavonjic@sfb.bg.ac.rs

sumption of wood pellets in many countries worldwide, especially in Europe. Wood pellet has become a global product whose volume of trade is increasing year after year.

In 2013, global production of wood pellets was 24.5 million tons, which was the increase of 11.7% compared to 2012. European Union (28) is the leader on the global level with the participation of 80.3% in the total worldwide consumption of this wood fuel (EPC 2014). Such a high consumption level in the European Union mostly results from the production realized in Europe as well as from the import which is increasing year after year. In 2013, import of the EU (27) was 6.2 million tons [1].

Trade processes and trends on the global level, and in particular the expressed demand and consumption of wood pellets in Europe also had an impact on the region of South East Europe in terms of the increase number of producers, production growth, export growth as well as the problems occurring during the development of the national markets in all countries in this region.

Subject, objective, and purpose of the paper

The main reasons for the research presented in this paper are the trends described in the introductory part of the paper, the fact that there are no sufficiently reliable data on the size of production, consumption, and foreign trade for most countries in South East Europe as well as the problems accompanying the development of the national market of wood pellets.

The main objective of the research was to collect the relevant data and obtain a clear picture of the condition in the region regarding all most significant segments of the wood pellets market. To that effect, research and analyses of the number of producers, size of installed capacities and volume of wood pellets production were carried out as well as the analyses of foreign trade flows and positions of certain countries in the region and the position of the region in Europe. Separate segment of the research involved the identification of the problems which limit faster development and sustainability of the wood pellets market both in individual countries and in the region as a whole and the related definition of the proposal of adequate measures for their elimination.

The research covered nine countries in South East Europe as follows: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Montenegro, Romania, Serbia, Slovenia, and Macedonia. Beside the stated countries, the research also covered Slovakia as a country in the European Union and the region of Central Europe, for the needs of comparative analysis of the situation in South East European countries and the situation in one of the countries outside this region.

Taking into consideration the complexity of the research, size of the region and existing limitations, the research covered the year of 2013 and in certain segments it covered the year of 2014 as well. However, the defined methodology, established network of stakeholders and gained experience and skills will be of great benefit for further monitoring of situation in this field in the years to come. To that effect, this paper can be of great benefit to the decision makers in the region, to professional and scientific public, national and international organizations and institutions when this region is no longer a huge gap on the maps, in reports and analyses made on the European and global level.

Used methodology

For the needs of data collection and observation of the situation regarding the number of producers, size of installed capacities, realized production and problems which the producers face, field research was conducted during which interviewing method was used combined with questionnaire method. Such an approach required the establishment of adequate network of as-

sociates in the selected countries who performed the data collection according to the unique methodology and unique questionnaires.

The collected data on the producers, their locations and size of the installed capacities are processed in ARC GIS program package, in which the map of producers is made. Other data are processed in Excel program package.

Analysis of foreign trade flows was done based on the data from EUROSTAT, statistical offices and institutes in the selected countries regarding export, import and the most significant countries with which wood pellets are traded.

For the needs of analyzing the current situation and problems accompanying the development of the national market in the selected countries, field research was done and questionnaire was conducted among the distributors, certain households and public and commercial facilities. For the purpose of observing the problem referring to the quality of wood pellets, adequate samples of wood pellets distributed on the Slovenian market were tested in the laboratory for biomass on the Slovenian Forestry Institute in Ljubljana. The results obtained in this example largely reflect the situation in other countries in this region.

Secondary sources of the data from reports of international organizations and associations referring to wood pellets were also used in this paper.

Development of wood pellets market in south east Europe

Analysis of wood pellets market in South East Europe included three key segments, namely: production, foreign trade flows, and wood pellets supply chain.

Installed capacities and production of wood pellets in South East Europe

In the middle of 2014, 245 producers were engaged in wood pellets production in South East Europe and Slovakia (fig. 1).

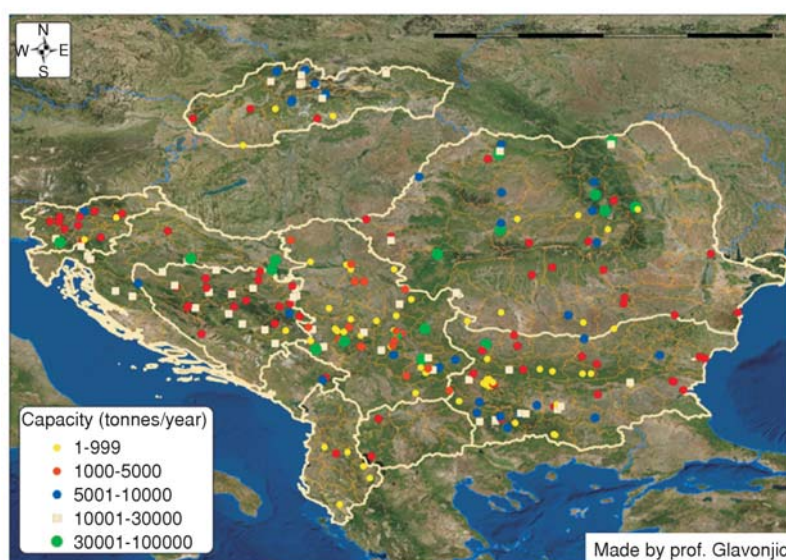


Figure 1. Map of wood pellet producers in South East Europe (source: original)
(for color image see journal web site)

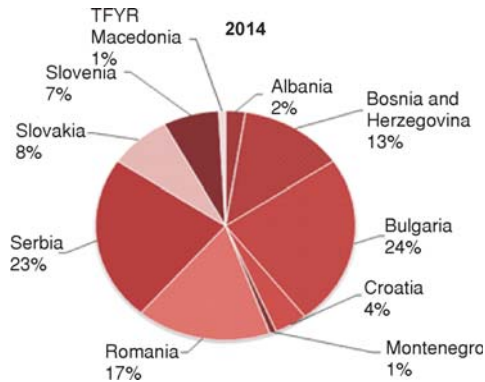


Figure 2. Participation of certain countries in the total number of wood pellet producers in the Region (source: original)

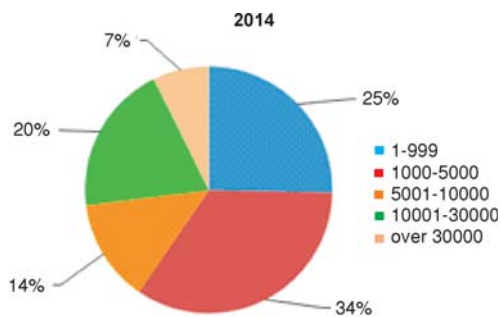


Figure 3. Participation of producer categories according to the size of installed capacities (ton per year) (source: original)

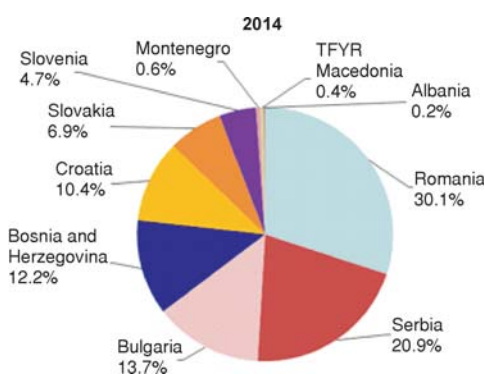


Figure 4. Share of total installed capacities for the production of wood pellets per countries in the Region (source: original)

Out of the total number of producers, 116 producers or 47% were located in Bulgaria and Serbia (fig. 2)*.

Among other countries, Romania (41) and Bosnia and Herzegovina (32) stand out. Most producers of wood pellets have installed capacities of 1,000-5,000 tons on annual level, followed by the producers whose capacities do not exceed 1,000 tons per year, while there are only 18 big producers whose installed capacities exceed 30,000 tons (fig. 3).

Most factories with installed capacities over 30,000 tons per year are located in Romania, Serbia, and Croatia, while Albania, Macedonia, and Montenegro do not have such large factories. Thus, Romania and Serbia represent the leading countries in the region according to the size of installed capacities. Total installed capacities for the production of wood pellets in the Region were 2.2 million tons in 2013 and they increased to 2.41 million tons in 2014 with the construction of new factories. More than 1/2 (51%) of the installed capacities are located in Romania and Serbia (1.23 million tons) and according to this parameter they represent the leading countries in the Region (fig. 4).

There was a rapid increase of the number of producers and factories and plants in the last three years due to high demand in the European Union countries and consequently the export of wood pellets from this region increased as well. This resulted in overdimensioning of total installed capacities for wood pellets production in certain countries compared to the potentials for raw material supply. Therefore, production of wood pellets in these countries is significantly below the installed capacities. Results of the conducted questionnaire regarding the level of utilization of capacities in individual facto-

* This figure does not include the producers which stopped their production in the middle of 2014 or certain small producers who are occasionally engaged in wood pellets production.

ries in these countries show that it varies a lot ranging from very low (20-30%) to high (over 85%).

In 2013, total production of wood pellets was 1.36 million tons in the region, 63.2% of which or 0.86 million tons was produced in Romania, Bosnia and Herzegovina, and Croatia (fig. 5).

Production of wood pellets in Serbia, Bulgaria, and Slovakia was 100,000-165,000 tons, in Slovenia 90,000 tons, but in other countries it did not exceed 5,000 tons. Serbia and Bulgaria had the highest disproportion between the size of the installed capacities and realized production of wood pellets in 2013, which goes in favor of the previous statement that installed capacities in these countries are over-dimensioned compared to the potentials for providing adequate raw material. Total production of wood pellets in Serbia in the amount of 161,915 tons in 2013 represented 43.9% of the size of the installed capacities, while this ratio was even more unfavorable in Bulgaria, namely only 36.3%. In other countries in the region, with the exception of Albania, Montenegro, and Macedonia, this ratio was over 60%, and the best was in Slovenia, Slovakia, and Romania (over 70%). Installed capacities for the production of wood pellets in Albania, Montenegro, and Macedonia are not over-dimensioned compared to the potentials for providing raw material from the national market, however they are used with relatively low utilization degree because of the characteristics of machines and equipment as well as the problems caused by such equipment (in most cases it is used equipment).

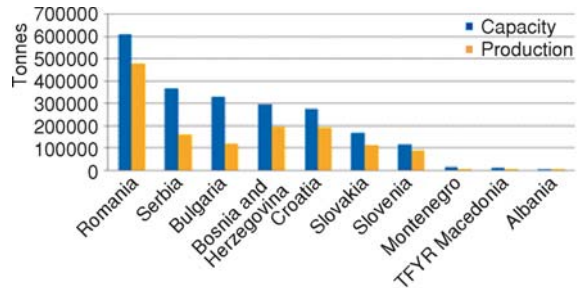


Figure 5. Relation between production of wood pellets and installed capacities in the selected countries in the Region (source: original)

Wood pellets trade

Analysis of wood pellets trade included their export and import, overview of trade flows between the countries in the Region as well as the overview of the most significant countries outside the Region where they were exported. Analysis of trade flows includes data for 2013 as the last year for which data were available.

Total export of wood pellets in 2013 was 1.06 million tons or 77.9% of the realized production, while the import was only 162 thousand tons. Romania, Bosnia and Herzegovina, Croatia, and Serbia were the biggest exporters of wood pellets with more than 80% of the total export while other countries had significantly lower participation (fig. 6).

In the last ten years, export of wood pellets was the main driving force and motive for investing in new factories and for constant increase of their number and the size of installed capacities in almost all countries in the region. Increase of demand and consumption of wood pellets in the European Union so far and the forecasts of their

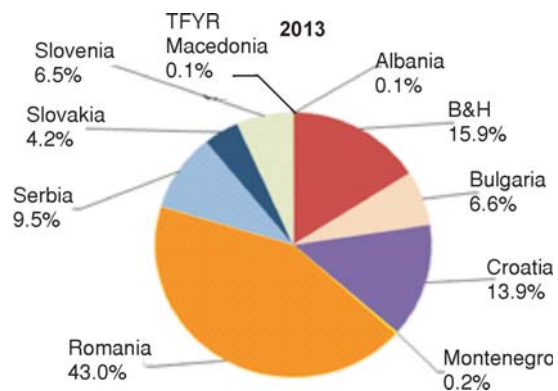


Figure 6. Export of wood pellets from South East Europe by country of origin [2-7]

further increase in the upcoming ten years has had an impact on the investors from the EU and from countries itself to invest in new factories with large capacities. Almost entire production from their factories is intended for export. Very low consumption on the national market in most countries in the region has also contributed to the increase of wood pellets export. Increase of consumption in certain countries has become noticeable in the last two years, however it is still symbolic compared to the realized production (the only exception is Slovenia). Thus, for example, consumption of wood pellets in Serbia was 7,772 tons in 2011, however in 2013 it exceeded to 65,000 tons [8, 9].

The lowest ratio of national consumption/production in 2013 was in Romania (6.2%), Bosnia and Herzegovina (13.4%), and Croatia (23.4%). On the other hand, Slovenia, Macedonia, and Montenegro realized a significant part of their consumption of wood pellets by importing from other countries in the region, primarily from Serbia.

Analysis of the flows of wood pellets trade shows that only 13.4% of the total export of wood pellets is realized between the countries in the region, while 86.6% is exported outside the region, mostly to the EU (23). Bosnia and Herzegovina (39.6%) and Serbia (31.8%) have the highest participation of trade with the countries in the region. Such high participation of wood pellets trade of these two countries results from their export to Slovenia, which is for most producers in these countries only a transit country where pellets are stored (especially during summer months, because storage costs are much lower than in Italy) wherefrom wood pellets are further distributed to the buyers in Italy.

Small trade volume between the countries in the region results from still undeveloped market and consumption in respective countries as well as from strong business connections with the distributors from certain EU countries, primarily from Italy.

Analysis of the export focus on the EU (23) market shows that Italy is the target country for exporting wood pellets from the region with the participation of 62.5% in 2013 (fig. 7).

Among other countries to which wood pellets are exported, Austria, Greece, and Hungary stand out. Despite the significantly high export to Italy in the amount of 575,135 tons, this region participated with only 17.5% in the total consumption in 2013. In order to meet the increase of demand, and consequently the consumption, Italy imported 1.75 million tons of wood pellets in 2013, 1.17 million tons of which were imported from outside this region [2]. This fact additionally explains why new factories for

wood pellets production continue to be constructed in almost all countries in the region.

The highest ratio of export/production of wood pellets is in Romania (95.1%), Bosnia and Herzegovina (86.7%), Montenegro (84.3%), and Croatia (77.8), which goes in favor of the fact that the national market in these countries is extremely undeveloped. The lowest ratio of export/production is in Macedonia, Albania, and Slovakia and it must be noted that the current production in Macedonia and Albania is below 5,000 tons on annual level.

Exceptionally high value of wood pellets export certainly gives a positive contribution to the foreign trade balance of certain countries and the region as a whole. In 2013, total value of wood pellets export was US\$ 237.3 million, with the highest participation of Romania amount-

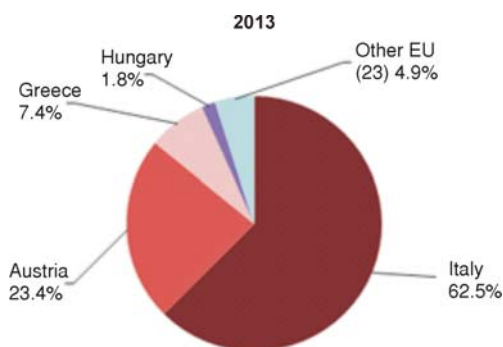


Figure 7. Structure of export to EU countries [2-7]

ing to US\$ 105.8 million or 44.6%. It is followed by Croatia with US\$ 33.9 million and Bosnia and Herzegovina with US\$ 33.7 million.

On the other hand, with the exception of Albania and Montenegro, all the countries in the region are big importers of natural gas. In 2013, total value of the imported gas in all the countries in this region was US\$ 7.1 billion. Average price of 1 kWh of the imported natural gas ranged from c\$ 6.7 in Bulgaria to c\$ 11.2 in Bosnia and Herzegovina. Tak-

ing into consideration the fact that green energy is exported along with the export of wood pellets, there are certainly potentials in all the countries in the region to reduce import dependence and import of fossil fuels such as natural gas by reducing their import and stimulating the consumption on the national market. Additional reason for this is the fact that average price of 1 kWh of exported pellets is significantly lower than the average price of 1 kWh of imported natural gas, beside the fact that the energy exported through wood pellets export is the so called green energy [10]. Figure 8 gives the overview of average values of 1 kWh of exported wood pellets and the values of 1 kWh of imported natural gas for each country individually.

The most unfavorable ratio between the average price of 1 kWh of exported wood pellets (c\$ 4.2) and the average value of 1 kWh of imported natural gas (c\$ 11.2) is in Bosnia and Herzegovina and the most favorable ratio is in Romania (c\$ 4.8:6.7). Slovenia is the country with the highest average value of 1 kWh of exported pellets in 2013 amounting to c\$ 5.7.

Wood pellets supply chain and the main limitations for the development of wood pellets market in South East Europe

Concerning wood pellets supply chain, the research conducted in the countries in the region show that it consists of 3 main segments (fig. 9): wood pellets production, wood pellets distribution, and end users.

The number of participants in certain segments is the same as presented on fig. 9 for most countries, while in certain countries is somewhat lower in the segments of distribution and consumption (for example, there is no consumption of wood pellets in district heating systems in Montenegro and Albania). In spite of minor differences in certain countries, the example given on fig. 9 can be accepted as a general supply chain of wood pellets in the countries in South East Europe.

Since the production of wood pellets in all countries in the region is almost entirely realized from national raw material resources (participation of import is symbolic), organization, functioning, and arrangement of the supply chain is extremely important for all participants.

Firewood warehouses and private entrepreneurs have the most significant role in the distribution system of wood pellets for households. Smaller amounts are distributed through retail shops and by direct supply of the producers to the households. In Slovenia, there are also biomass trade centers (BTC) where households and other consumers supply themselves with wood pellets [11].

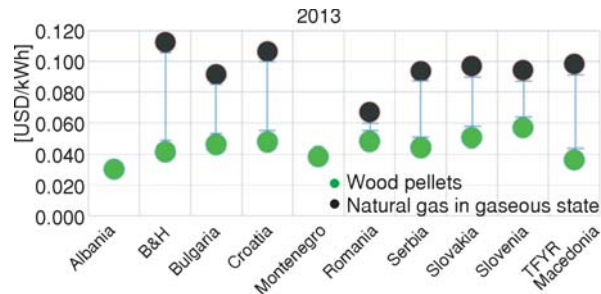


Figure 8. Average values of 1 kWh of exported wood pellets and the values of 1 kWh of imported natural gas [2-7]

Concerning other consumer categories (commercial and public facilities), in most cases they supply themselves by direct purchase from the producers, and in less degree from warehouses, BTC, and entrepreneurs.

Since the number of households which use wood pellets is increasing year after year and the number of public and commercial facilities which are substituting heating oil and light oil with wood pellets is also increasing, these consumer categories are the main generators of consumption of this wood fuel on the national market in all the countries in the region. Extremely high prices of light oil and heating oil are the main reason for households and public and commercial facilities to substitute these fossil fuels with wood pellets. This statement is best confirmed by the situation regarding the prices of heating oil in Slovenia [12].

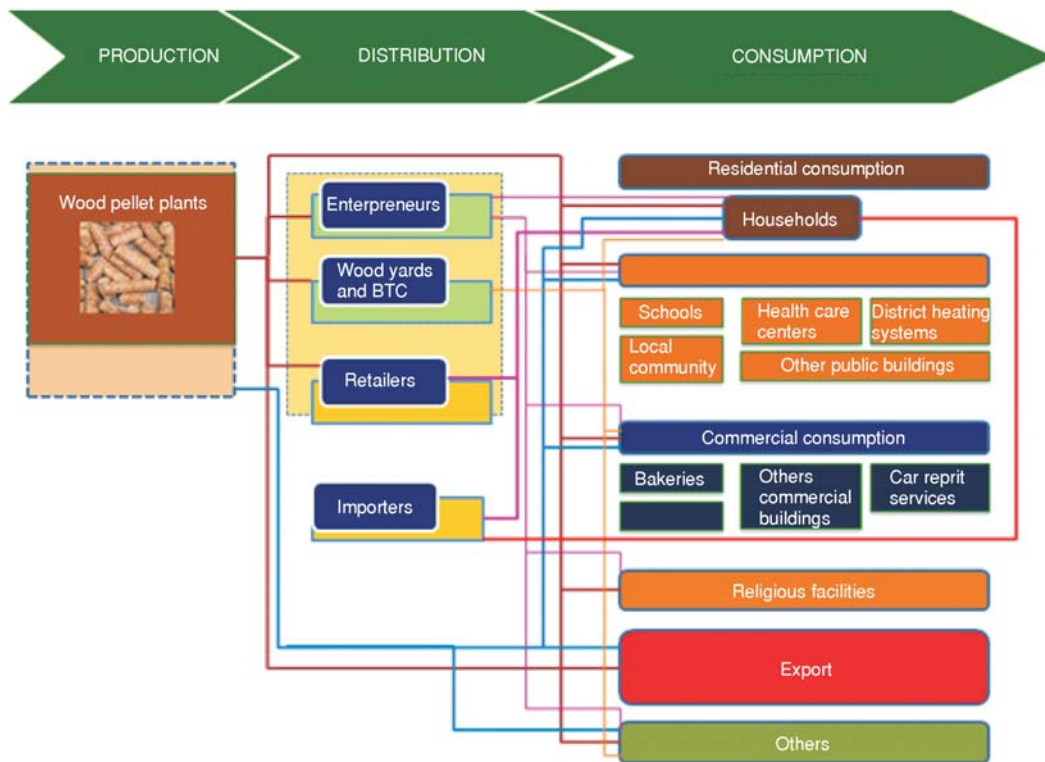


Figure 9. General wood pellets supply chain in South East European countries (current situation) [9]

Households in Slovenia (especially in urban areas) using heating oil were looking for new and cheaper solutions. Switching from heating oil to wood pellets with only small modification of the existing oil boiler (changing only the burner) was the cheapest but not the most efficient solution [11].

In this segment of supply chain, there are problems referring to the quality of wood pellets and the problems referring to the quality of appliances for their combustion. Almost all producers of wood pellets possess adequate attestations and certificates for their quality issued by the national, and in several cases international laboratories. However, the manner of issuing attestation on the quality of wood pellets by the national laboratories is highly problematic in

most countries because it is issued based on the testing of the brought pellet sample, not of the sample taken from the production.

Results of tests conducted in Slovenia show best which problems appear on the wood pellets market concerning their quality. According to [11], at the Slovenian Forestry Institute in the Laboratory for Woody Biomass, 104 different pellet samples were analyzed in the past three years. Most of the pellet samples (39%) analyzed in this laboratory, originated from Slovenia, followed by Bosnia and Herzegovina (16%), Ukraine (6%), and Croatia (4%). The origin of almost 24% samples was unknown.

At almost 50% of the samples the wood species composition of the pellets was not indicated. The most common composition of wood pellets on Slovenian market is 80% coniferous wood and 20% broadleaved wood, followed by pellets made of 100% coniferous wood.

According to results of measurements almost 41% did not meet the requirements of the standard (do not meet the requirements neither for quality class B, which means that according to standard EN ISO 17225-2:2014 such samples are not suitable for commercial non-industrial use), 21% of samples corresponded to quality class B, 24% with A2, and only 14% to class A1.

Important parameter for quality of the pellets is mechanical durability. Mechanical durability indicates the characteristic of pellets to fall apart during the manipulation. Pellets with low mechanical durability will cause more dust and fine particles in sacks. In general, major issue of Slovenian pellet producers and distributors is to assure the proper mechanical durability of pellets; 51% of analyzed pellets had mechanical durability higher than 97.5% (which corresponds to the requirements for quality class A1 and A2, respectively, according to standard EN ISO 17225-2:2014), around 25% of the analyzed pellet samples had mechanical durability lower than 96.5% and therefore didn't meet the requirements of any of the quality classes defined by EN ISO 17225-2:2014.

The greatest number of importers and distributors of wood pellets in West European countries require the possession of EN plus certificates. Distributors and importers from the EU who do not require this type of certificates are rare. By the end of 2014, there were the total of 28 producers from the region who possessed EN plus certificates. Most producers with EN plus certificates are located in Croatia (7), followed by Serbia (6), and Romania (6) [13].

For the purpose of protecting end consumers, it is necessary to make adequate technical regulations as soon as possible in most countries in the region, which would regulate the system of wood pellets distribution on the market in terms of the manner of testing the quality and obligations of the distributor. One of important elements which such a technical regulation should contain is the obligatory application of the procedures from adequate EN standards for testing the quality of wood pellets.

Apart from technical regulations, it is also necessary to work on the arrangement of other market elements as well as on the education of end consumers, especially households, in order to increase the level of their knowledge, and consequently the level of their requirements from suppliers.

One of significant obstacles to faster development of wood pellets market in the countries in the region is high VAT rates. Results of researching the level of VAT applied to wood pellets show that there are no reduced rates in any of the countries in the region, on the contrary, VAT is paid according to the general rate (tab. 1).

With the exception of Serbia, in all other countries in the region VAT rate is the same for pellets and gas. In Serbia, VAT for gas is 10% and VAT for wood pellets is 20%, which is not logical and represents a strong barrier for increasing wood pellets consumption.

Table 1. VAT rates paid for wood pellets trade in the countries in South East Europe

Country	VAT rate in [%]	
	For wood pellets	For gas
Bosnia and Herzegovina	17	17
TFYR Macedonia	18	18
Montenegro	19	19
Serbia	20	10
Albania	20	–
Slovenia	22	22
Croatia	25	25

Note: The countries are arranged from the lowest to the highest VAT rate
Source: [10]

increase of wood pellets consumption with fiscal measures. When subsidy (stimulating) measures for purchasing new efficient wood pellet burning appliances are added to the aforementioned, it is clear why these four countries are among the biggest consumers of wood pellets in Europe.

With the exception of Slovenia, in all other countries in the region stimulating measures either do not exist or they come down to the activities of international donor organizations or national ministries for the procurement of wood pellet burning appliances in schools and public facilities.

In Slovenia, a system for supporting implementation of modern boilers in households is established. Eco-fund of Republic of Slovenia is responsible for this system of subsidies but the main issue is that only modern and efficient boilers are supported with public money. The trend in the use of wood pellets started changing in 2011. That can be seen from the number of households asking for subsidies for modern boilers (1,012 in 2011 and 2,200 in 2012) [15].

Households in Slovenia can get a subsidy for modern woody biomass boilers but only for central heating of the house and for boiler that meets the following criteria [15]:

- efficiency of the boiler should be above 90%,
- dust emissions less than 40 mg/m³, and
- CO emissions 500 mg/m³.

The subsidy for woody biomass boilers can cover up to 25 % of eligible investment costs (but not more than 2,000 € for boilers with nominal capacity up to 40 kW; 7,500 € for boilers with nominal capacity from 40 up to 120 kW and 15,000 € for boilers with nominal capacity more than 120 kW) [15].

For overcoming the existing problems and limitations for sustainable development of wood pellets market in most countries in the region it is necessary to implement the following measures:

- adopt standards for pellets quality,
- adopt all necessary standards for certification of appliances (stoves and boilers),
- adopt adequate technical regulations which would regulate the quality control system of wood pellets and appliances distributed on the market,
- increase national administrative, technical and legal capacities for verification and certification,
- identify different laboratories for R&D,

Examples from certain west European countries show best the significance of VAT rate on wood pellets for consumption development: UK 5%, Italy 10%, Austria 10%, Germany 7% [14].

For the purpose of stimulating the consumption of wood pellets in the UK, Italy, Austria, and Germany, VAT is at least twice (Austria) or 4 times (UK) lower than the general VAT rate. Thus, these countries are the best example for policy makers in South East European countries how it is possible to have positive impact on the in-

- support the co-operation between the laboratories and industries,
- support the establishing a network and cooperation between the laboratories on the national and international level,
- support the realization of demonstration projects through local, national and international funds
- support promotional activities presenting utilization of wood pellets, and
- support development of pellets market.

The utilization of low quality pellets must be prevented as they could provoke the malfunctioning of the heating appliances and finally lead to lower consumers' confidence.

Based on the above mentioned facts, it can be concluded that the market of wood pellets is still developing in most countries in the region and the problems it faces clearly indicate that it is developing randomly.

Conclusions

Results of the conducted research show that the number of existing factories and the size of installed capacities are over-dimensioned in most countries in this region compared to the availability of wood raw material and consequently the capacities are used significantly below the optimal level. Such a condition in the factories which do not manage to provide sufficient raw material for own needs will not be sustainable in the long run. Increased prices of raw material and stronger competition of the factories for the production wood based panels which use the same raw material as wood pellet factories will cause the situation to get significantly tense in certain countries, primarily in Serbia, Bulgaria, and Romania. On the other hand, if stimulating measures are not adopted soon and barriers existing on the national market in most countries do not get removed, the largest amounts of produced wood pellets will continue to be exported.

References

- [1] ***, Forest Products Annual Market Review (FPAMR) 2013-2014, ECE/TIM/SP/36, Geneva Timber and Forest Study Paper 36, Forestry and Timber Section, United Nation, (2014), Geneva, Switzerland
- [2] ***, EUROSTAT data bases: <http://ec.europa.eu/eurostat/web/main/home>, Accessed January 2015
- [3] ***, Agency for Statistics of Bosnia and Herzegovina, <http://www.bhas.ba>, Accessed December 2014
- [4] ***, Instituti i Statistikave – Tiranë, Albania, www.instat.gov.al, Accessed December 2014
- [5] ***, State Statistical office of Republic of Macedonia, http://www.stat.gov.mk/Default_en.aspx, Accessed December 2014
- [6] ***, Statistical office of Montenegro, www.monstat.org, Accessed December 2014
- [7] ***, Statistical office of the Republic of Serbia, www.stat.gov.rs, Accessed January 2015
- [8] Glavonjić, B., Oblak, L., Consumption of Woody Biomass in Industry, Commercial and Public Facilities in Serbia – Present State and Possible Contribution to the Share of Renewable Sources in Final Energy Consumption, *Thermal Science*, 16 (2012), 1, pp. 7-19
- [9] Glavonjić, B., Wood Biofuels Market in Serbia, RENEXPO Western Balkans Conference, Belgrade, Serbia, <http://www.renxpo-belgrade.com/renexpo-2014-overview.html>, (2014), Accessed November 2014
- [10] Glavonjić, B., Wood Pellets Market in South-Eastern Europe, *Proceedings*, 5th International Wood Energy Conference, December 2014, Zagreb, www.wood-energy.info, Accessed December 2014
- [11] Krajnc, N., Wood Pellets in Slovenia: Quality, Production, Market and Price, *Proceedings*, 5th International Wood Energy Conference, December 2014, Zagreb, www.wood-energy.info, Accessed December 2014
- [12] ***, Ministry for Infrastructure of Republic of Slovenia, Prices of Heating Oil in Slovenia, www.energetika-portal.si, Accessed January 2015
- [13] ***, European Biomass Association (AEBIOM), Annual Report 2014, Brussels, <http://www.aebiom.org/>, (2015), Accessed January 2015

- [14] ***, European Pellet Council (EPC), European Wood Pellet Market Overview 2014, <http://www.pelletcouncil.eu/>, Accessed December 2014
- [15] ***, Eco-fund: Slovenian Environmental Public Fund, Internal rules, <http://www.ekosklad.si/html/razpisi/main.html>, Accessed December 2014