



BULGARIAN ASSOCIATION OF THE METALLURGICAL INDUSTRY

METALLURGY IN BULGARIA 2018

SOFIA, 2019

For 30 years the annual edition of the Bulgarian Association of Metallurgical Industry (BAMI) is giving an objective characteristic for the state and changes in the production, trade and consumption of metals and metallurgical products. It is intended for managers and experts in the companies BAMI-members, for partners in the country and abroad, it is also used by a wide range of external specialists.

The BAMI team prepared the "**Metallurgy in Bulgaria 2018**" thanks all member companies for the information provided on their activities and data on their production and realization, as well the Ministry of Economy for the assistance with information on the import and the export.

"**Metallurgy in Bulgaria**" is presenting industry-specific information, based on official data from the statistics and from the producers. Information about the BAMI activities and the directions on which the Association is working is not included in the annual edition. These topics are subject to other materials and reports published on the Association's website (www.bami.bg).

Additionally to the data from national sources, in the publication there is information obtained from external sources, such as Eurostat (www.ec.europa.eu) Eurofer (www.eurofer.eu), World Steel Association (www.worldsteel.org), Eurometaux (www.eurometaux.eu) and other international organizations active in the field of the ferrous and non-ferrous metallurgy.

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***THE FOLLOWING ABBREVIATIONS HAVE BEEN USED IN
THE ANNUAL***

ASSI	-	Average Social Security Income
AC	-	Apparent Consumption
BAMI	-	Bulgarian Association of the Metallurgical Industry
BCLA	-	Branch Collective Labour Agreement
BNB	-	Bulgarian National Bank
CEA	-	Classification of Economic Activity
CEE	-	Central and East Europe
C.I.S.	-	Community of Independent States (former USSR)
CR	-	Cold-rolled (rolled steel)
ETS	-	European emission trading scheme
GDP	-	Gross domestic product
GVA	-	Gross value added
HNFM	-	Heavy non-ferrous metals
HR	-	Hot-rolled (rolled steel)
ICSG	-	International Copper Study Group
ILZRO	-	International Lead and Zinc Research Organization
LME	-	London Metal Exchange
MF	-	Ministry of Finance
MSST	-	Minimum Social Security Threshold
NCEA	-	National Classification of Economic Activity
NF	-	Non-Ferrous
NFM	-	Non-Ferrous Metals
NRA	-	National Revenue Agency
NSI	-	National Statistic Institute
NSSI	-	National Social Security Institute
p.e.	-	petroleum equivalent
PP	-	Purchasing Power
RFM	-	Rolled Ferrous Metal (steel)
RHC	-	Real Home Consumption

DEAR LADIES AND GENTLEMEN,



*As over three decades the Bulgarian Association of the Metallurgical Industry(BAMI) is preparing and publishing the specialized annual edition **Metallurgy in Bulgaria 2018**, which we are presenting to your attention.*

In the edition you will find again important indicators of the metallurgical industry, data on the Bulgarian, the European and the world production, collected and systematized for a period of several consecutive years.

The year 2018 passed under the sign of the Bulgarian Presidency of the EU Council. In the program of the Bulgarian Presidency BAMI representatives and the big metallurgical companies actively participated in the organization, the financing and the implementation of several events. The EU steel and non-ferrous metallurgical associations were also actively presented. Together we have placed our message to the European Commission and the EU member states about an EU long-term industrial strategy. The aim was to underline that the European economy and the modern way of life need an innovative high-tech industry with the leading role of the well working and developing metallurgy.

During this period, the companies manufacturers of metal and metal products continued to meet their goals – to invest in new technologies and high value added productions, working at the same time for sustainable development, preservation of nature and a good working environment. Education, social policy and support for the regions were also in their priorities. Good results have been achieved, there is an increase in the natural and economic indicators of the mining and of the processing of metals to finished products and articles.

Our successes are the result of a long-term vision and work for sustainable and competitive development. They are a guarantee for a successful future- a future that is setting new goals in response to the challenges of today's digital world. I am confident that the Bulgarian metallurgy will deal with them as well.

Finally, I would like to thank everyone who contributed to this edition, useful not only for the Bulgarian metallurgists but also for a wide range of users in the country and abroad.

Yours faithfully,

ANTON PETROV

Chairman of the Board

SECTION ONE

THE ECONOMY IN 2018 (BULGARIA AND EU – REVIEW)

1. 1. POPULATION, LABOR MARKET, WAGES

The past year 2018 was characterized by a successful development of the economy and of the main sectors of the Bulgarian industry. External and internal factors had their influence – financial and political stability, social environment, markets, trade sanctions, military conflicts. The Bulgarian industry, incl. the metallurgy, reported positive economic performance and a growth despite the still low growth of the European economy, the current sanctions against Russia, the import duties imposed by the USA on metallurgical products, the emigration crisis and conflicts in different regions of the world. Additional internal factors had also their impact - the demographic crisis, the education and labor market problems, the energy and the migration of young people from the country.

As a result of all these in 2018 the Bulgarian economy is keeping the GDP growth rate of the last few years expecting an increase of 3.1% - which does not change the country's last position among the EU member states.

The demographic indicators continue to decline, both in terms of population size and in age, and in educational characteristics. **Over a decade the population of Bulgaria is decreasing with every year, incl. in 2018 by 50 thousand people.**

According to the data presented in Table 1.1, the ratio urban-to-rural population is 3 to 1, changing steadily over the years to the benefit of urban residents. The villages continue to depopulate and in the last five years the share of the rural population decreased by 93.8 thousand people or 0.6%.

Table 1.1

Population by categories, thousand people

Population categories:	2015		2016		2017		2018	
	X 1000	%	X 1000	%	X 1000	%	X 1000	%
City/town population	5 227.1	73.1	5 204.4	73.3	5 181.8	73.5	5 159.1	73.7
Village population	1 926.7	26.9	1 897.4	26.7	1 868.3	26.5	1 840.9	26.3
Males	3 477.2		3 449.9		3 422.4		3 395.7	
Females	3 676.6		3 651.9		3 627.6		3 604.3	
Total:	7 153.8	100.0	7 101.8	100.0	7 050.0	100.0	7 000.0	100.0

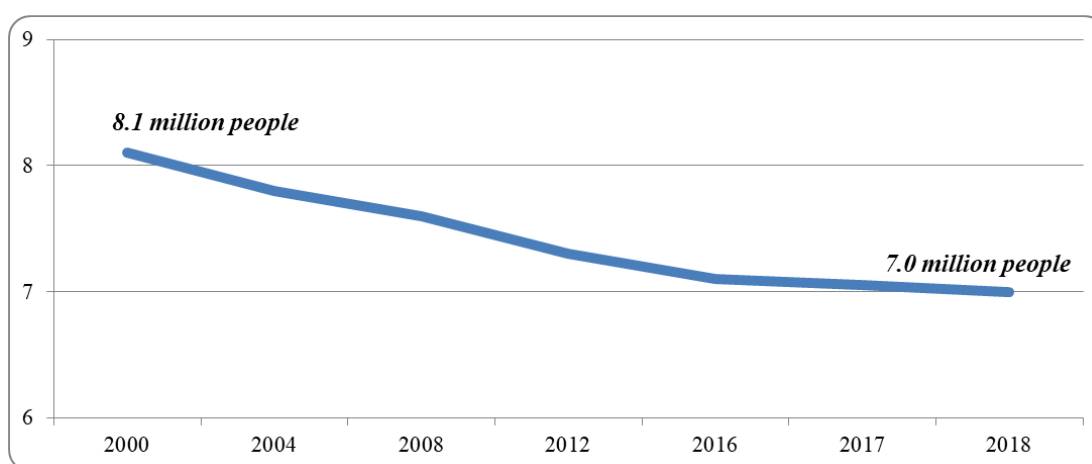
Source: NSI

The decrease in the number of the population is the result of many factors incl. the migration processes in the respective year. NSI data on external migration in the past year show as follows:

- Residents (immigrants) – 29 559 people – by 3 962 more than in 2017; 55% of them are Bulgarian citizens and 45% are foreigners,
- Migrated (emigrants) - 33 225 people - by 1 639 more than 2017, 94% of them are Bulgarian citizens

The balance shows **a negative mechanical growth of - 3 666 people (- 5 989 in 2017)**. Regardless of the negative mechanical growth's decline the number of displaced Bulgarians is high and the trend is lasting.

Figure 1.1



Population in Bulgaria, million people

Among all EU(28) Bulgaria reports the highest negative values in natural growth. Figure 1.1 shows that since the year 2000 the real decrease is by more than 1.100 million people.

The low birth rate and the migration of families with children lead to unfavorable age characteristics of the population. In 2018 the structure of the population by groups is as follows:

- Under working age (under 15 years old) – 15.2 %, in EU – 15.6 %;
- At working age – 60 %, incl. 15-24 years old - 9.1 %, in EU – 10.8 %;
- Over working age – 24.8 % .

In Bulgaria the most promising age group 15-24 years is decreasing steadily - in 2018 it was **9.1 % - by 1.7 % less than the average in the EU**. When taking also into account the expected negative growth, **in the coming years the business can not rely on an increasing number of local manpower**. And manpower import is only a part of this problem's solution.

The demographic indicators depend on the quality and standard of life in the country, reflecting the average life expectancy. According the NSI data for 2017 **the average life expectancy in the EU is 80.9 years, in Bulgaria it is the lowest within the EU - 74.8 years**, i.e. Bulgarians live 6.1 years less. For females this difference is 5.1 years and for the males - 6.9 years.

In line with the demographic characteristics, the labor market also changing. In Table 1.2 data are presented on the average annual **number of employees** under labor and employment contract, on labor income and some social parameters in the year 2017.

Table 1.2

Average number of employed people, level of unemployment, inflation

Indicators	2014	2015	2016	2017	2018*
Average annual number of employed people (national calculations), in thousands	2 203.1	2 254.8	2 277.3	2 308.1	2 238.4
Average annual number of registered unemployed people, in thousands	384.5	305.1	247.2	206.9	173.3
Average annual level of unemployment (NSI), %	11.4	9.1	7.6	6.2	5.2
Inflation/deflation rate	-1.4	- 0.1	- 0.8	2.1	2.4
Average monthly wage of persons on labor and service contracts, BGN	822	878	962	1 037	1 135
- public sector	888	926	984	1 065	1 165
- private sector	800	863	954	1 029	1 126
- incl. processing industry	700	761	846	930	1 018
Average monthly wage in activity 2.4 "Production of basic metals":	1 178	1 187	1 303	1 356	1 471
• ferrous metallurgy	1 050	1 077	1 257	1 440	1 550
• non-ferrous metallurgy	1 661	1658	1774	1 770	1 950
• metal casting	692	740	827	943	1 032

*Source: NSI, *preliminary data*

The data for 2018 compared to the previous periods show that the number of employees under labor and employment contracts in the previous four years is increasing. However **for the last 2018 the NSI reported (preliminary data) a decrease by 69.7 thousand people**, in the same time the percentage of registered unemployed continue to decrease - by -1% coming to 5.2%.

These contradictory data – the decline of the employed persons (- 34 thousand people) parallel to the decreased percentage of the unemployment, could be explained with changes of the main demographic characteristics – declining percentage of the working population (aging) and emigration of manpower.

In 2018 all industrial sectors are reporting a decreased number of employees exempt the mining with a small increase of the employees – 50 people. The number of the employees in the processing industry decreased in total by 17 thousand, in the energy sector by 200, in the sector water and waste management by ca. 1000 and the construction – by 7 thousand. Despite the overall decrease in the processing industry, the number of employees in the activity "Production of basic metals" increased in 2017 by 655 people (1.7%).

Ca. 50% of the unemployed have basic/primary education and 30% even lower. **The labor market does not meet the needs of the industry and the situation is not improving.**

The incomes of employees under labor and employment contract have increased by 38% in total over the last 5 years, and only in 2018 - by 9.5%. In 2018 the average wage in the country reached BGN 1 135 - an increase by BGN 98 compared to 2017; in the public sector it was by BGN 39 leva higher than in the private sector.

In the processing industry the average wage was BGN 1018 - an increase by 9.5 %. For the same time the Gross Value Added (GVA) in the industry has increased by 1.52 %. **The growth of the wages is high and overcoming.** This disproportion is due to the impact of the administratively determined minimal wage in the country, calculated ignoring any criteria and without taking into account real economic indicators of the industry.

The average wage and the average insured income of the employees in the metallurgy are among the highest in the country. The preliminary NSI for 2018 show that the average wage for the ferrous and the non-ferrous metallurgy, and metals casting was **BGN 1 471** - 1.5 times higher than the average wage in the processing industry. The highest average wage was reported in the non-ferrous metallurgy – ca.2 times higher than the average wage of all employed by labor contract in the country.

The minimum wage in the metallurgy is negotiated with the social partners, signing a Branch Collective Labor Agreement (BCLA) valid for 2 years. The minimum wage for the period 2019-2020 is with BGN 100 higher than this in the country, higher values have been agreed for other additional payments and social benefits as well.

Due to the specific working environment in the metal production there are legislative fixed additional payments to the employees and this increases the employer's labor cost over the wages. For the most economic sectors and activities, these costs are not inherent.

In the metallurgy, in the processing industry and in the power generation the relative share of **the wages of the employer's whole labor expenses was ca. 70% in front of the high level of the average wages in these sectors.** In the other activities of the processing industry and average for the country, the expenses for wages had a share of ca. 82%. The employers in the basic industry have additional costs due to **higher social security contributions at their expense, payments for specific working conditions, social benefits and allowances.**

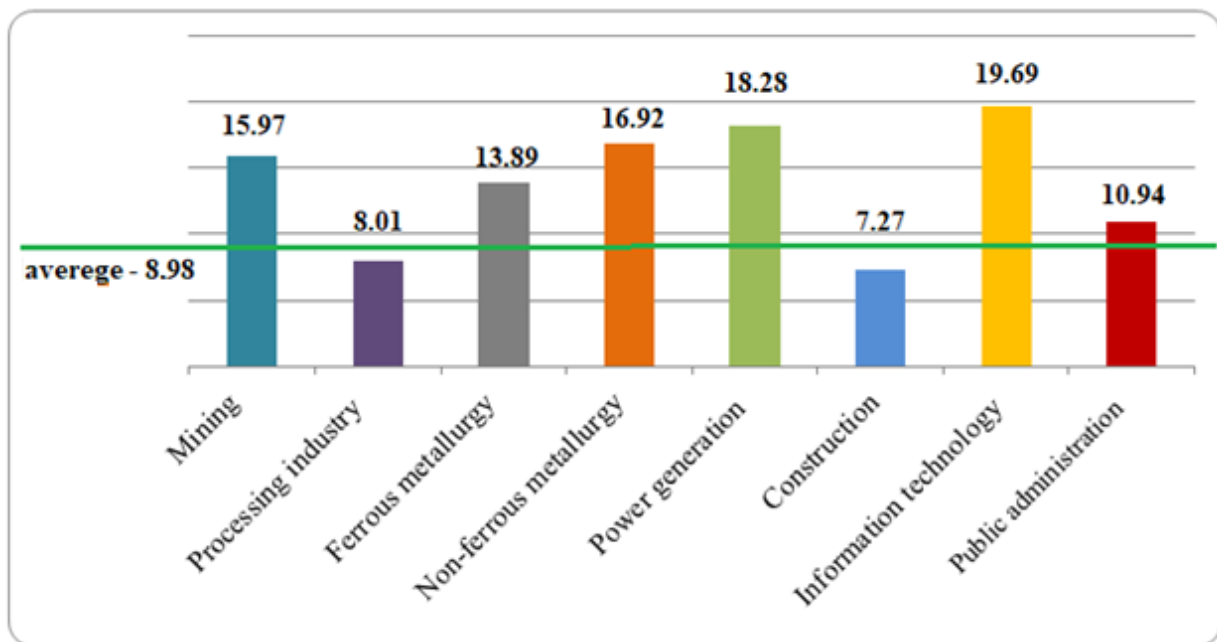
The structure of the costs that employers realized for one employee average for the country and in some industry sectors, is shown in the following Table:

	Wage	Insurances by the employer	Other social allowances*
Total for the country, %	81.8	14.7	3.5
Mining	71.6	19.0	9.4
Processing industry incl. metallurgy	82.0 71.0	14.8 18.0	3.2 11
Energy	70.2	16.8	13

*incl. compensation paid

Figure1.2 presents the employer’s costs per hour for labor in BGN for employees under labor and service contract in 2017 – average for the country and in the main industry sectors, incl. the metallurgy.

Figure1.2



Employer’s labor costs, BGN/working hour

Source: NSI

The employers in the IT are having the highest costs per working hour, and those are mainly for wages. The energy sector is following and **the third place occupies the non-ferrous metallurgy**. Afterwards are the mining and **the ferrous metallurgy ranking fifth** (in 2016 the ferrous metallurgy ranked sixth).

Compared to the previous year 2016, labor costs in the country increased by 111 %, in the ferrous metallurgy the increase was by 118 %, and in the non-ferrous metallurgy - by 106 %.

1.2. GDP, GVA, PRODUCTIVITY

In 2017, the world economy reported a growth by 3.5 %, for the EU(28) the average growth was by 2.1 %, and for the Bulgarian economy - by 3 %.

According to Eurostat, in 2018 the produced **GDP per capita in the EU (28) was EUR 30 900 - an increase by 3%. In Bulgaria, according to preliminary data, it was EUR 7 800 – an increase by 6.8%**, and was in the same time 4 times lower than the average in the EU. Bulgaria is the only member state with GDP under EUR 10 000 per capita. In 2018 this indicator for Romania was EUR10 400 per capita, with an yearly growth by more than 8%. Nearest to these indicators reported Poland – EUR 12 900 per capita, Hungary – EUR 13 500 per capita, Latvia – EUR 15 300 per capita.

12 member states reported GDP per capita higher than the average for the EU(28), except Sweden all member states reported a growth of this indicator.

In terms of GDP per capita but defined in Purchasing Power Standards (PPS), our country also was behind the newly admitted CEE countries. In Bulgaria, the **GDP recalculated under the PPS represented 49% of the average for the EU (EUR 14 800)**. Indicators close to this reported Romania - 63% (EUR18 800), Poland - 70% (EUR 20 900), Hungary - 68% (EUR 20 300), Latvia - 6 7% (EUR 20 000). For the other CEE countries this indicator was above 70%.

Table 1.3 presents data about the Gross Value Added (GVA) and the Gross Domestic Product (GDP) for Bulgaria in total and by sectors for the period 2015-2018.

According to the NSI preliminary data the **GVA in 2018 was BGN 93 513 million, and the GDP - BGN 107 925 million.**

In 2018 the share of industry in the GVA was 23 % (24 % in 2017), and in the GDP – 20 % (21 % in 2017). The decrease of the GDP share was due to the higher growth of the value added for services - so the increase of value added in the industry was BGN 324 million and in services – ca. BGN 4 000 million.

After a reported increase in 2017, the agriculture accounted a decrease of the value added by 4.3 %.

Data show that **in 2018 the real economy** incl. the agriculture, the mining, the processing industry , the energy and the construction **produced 27.4% of the GDP**, the services produced 45.1% (44.2% in 2017), and the public administration, the education and the healthcare – 14%.

Table 1.3

GDP and GVA by sectors and groups, BGN million

Indicators:	2015	2016	2017	2018 *	
					%
Gross Value Added (GVA) – current prices, BGN million, incl.	76 546	79 937	87 634	93 513	86.6
- agriculture and forestry	3 664	3 519	4 114	3 937	3.7
- mining and processing industry, power generation, water and sanitation (B-E)	18 013	19 009	21 318	21 642	20.0
- construction (F)	3 322	3 388	3 606	3 996	3.7
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- trade, food, transport and communications (G-J)	20 937	22 039	24 735	26 882	24.9
- finance, insurance, real estate and other business services (K,L,M,N)	17 705	18 806	19 964	21 805	20.2
- public administration, education, healthcare (O-Q), others (R-U)	12 905	13 175	13 898	15 250	14.1
=====	=====	=====	=====	=====	=====
- adjustments (taxes)	12 025	12 698	13 408	14 412	13.4
Gross Domestic Product (GDP), BGN million	88 571	92 635	101 042	107 925	100.0

Source: NSI, *preliminary data

Preliminary NSI data show a **GDP increase** (in comparable prices) in 2018 compared to the previous year **by 3.1% and for GVA - by 3.0%** (3.6% and 3.7% respectively in 2017).

Although the relative share of industry in the country, for securing of jobs and for the exports of goods. According to the latest NSI data for 2017 presented in Table 1.4, all industry sectors reported increased production and value added.

Table 1.4

Industry, key economic indicators

CEA 2008 /INDICIES	2014	2015	2016	2017
INDUSTRIAL PRODUCTION, TOTAL	63 446	66 105	66 376	74 767
Mining /Sector B/				
- output produced, BGN million	2 433	2 435	2 496	2 852
- value added, BGN million	1 162	1 107	1 136	1 420
- employed, number	24 105	24 025	24 969	21 959
- value added/employee, BGN thousand	48.2	46.1	45.5	64.7
Processing industry /Sector C/				
- output produced, BGN million	52 383	54 354	54 773	62 623
- value added, BGN million	10 379	12 192	13 985	15 191
- employed, number	538 017	546 672	545 187	556 138
- value added /employee, BGN thousand	19.3	22.3	25.7	27.3
24. Production of basic metals				
- output produced, BGN million	7 310	7 412	6 780	9 559
- value added per employee, thousand BGN	52.3	56.8	66.3	81.7
incl. in the NF metallurgy, thousand BGN	94.7	119.9	123.6	145.3
Power generation /Sector D/				
-output produced, BGN million	7 275	7 899	7 627	7 739
- value added, BGN million	2 541	3 134	3 398	3 538
- employed, number	32 569	31 771	32 147	31 799
- value added /employee, BGN thousand	78.0	98.6	105.7	111.3
Water supply, sanitation, waste management /Sector E/				
- output produced, BGN million	1 355	1 417	1 480	1 553
- value added, BGN million	678	739	752	799
- employed, number	32 757	33 169	33 403	32 742
- value added /employee, BGN thousand	20.7	22.3	22.5	24.40

Source: NSI

In 2017 the **total output produced** was worth **BGN 74 767 million** – by **BGN 8 393 million more than in 2016** – an increase by **12.6 %**.

The processing industry showed the largest share of 83.8% and reported production worth BGN 62 623 million - an increase by 14.3%.

In 2017 the metallurgical industry, being part of the processing industry, has contributed significantly to these high indicators. The sector accounted production worth more than BGN 9.5 billion - an increase by BGN 2 779 million (39%). The contribution was due to the increased production of anode /cathode copper and of new products and products with higher prices and value added.

In 2017 the metallurgical industry produced **15.3 % of the processing industry's output and 12.8 % of the total industrial production of Bulgaria.**

Parallel to this indicator increased was the “value added per employee” for the sector – **an increase by 23 %. It was three times higher than the average for the processing industry** (BGN 27.3 thousand/employee). **For the non-ferrous metallurgy this indicator was BGN 145.3 thousand/employee – ca. five times higher than the average for the industry and one of the highest for the country.**

1.3. ENERGY CONSUMPTION, FREIGHT TURNOVER

The specific nature of high-temperature metallurgical processes determines the sector as an energy-intensive, strongly dependent on the prices and markets of energy sources - mainly electricity and natural gas.

Another characteristic of the metallurgical industry is the high consumption of materials and the need these materials to be transported. Huge quantities of goods are subject of transportation between the production sites on the territory of the country and the borders in order the import of raw materials and the export of finished products to be realized.

In order to compensate for the negative impact of the increased electricity prices in 2018, an **ORDINANCE № E-RD-04-06/2016 was adopted on reducing the burden related to the costs of energy from renewable sources.** Pursuant to this Ordinance, the enterprises producing and processing ferrous and non-ferrous metals have received financial compensations to recover a part of the increased costs for “green” energy. This aid scheme shall operate till December 31, 2020, the amount being fixed for each pricing period. The EC is acting towards elaboration of the relevant legislation in order this practice to be continued.

In 2018 the energy intensive industries, incl. the metallurgy, made a proposal towards extension the scope of the electricity purchase scheme by including preferential prices for electricity obtained from cogeneration. A notification from the EC is expected in 2019 and a respective solution as well.

The NSI reported for 2017 a total energy consumption by the industry of **2 721.3 thousand tons of petroleum equivalent (p.e.)** - by 80 thousand tons p.e. more compared to the previous year. The industry consumption was 2 665.4 thousand tons p.e. and 55.9 thousand tons p.e. consumed the construction sector. By type of energy resources the highest share had the natural gas – 929 thousand tons p.e. or 34 % (918 thousand tons p.e. or 35 % in 2016). The electricity consumption was 809 thousand tons p.e. and a share of 30 %

(767 thousand tons p.e. and 29 % in the previous year). The electricity consumption in the industry shows an overcoming development compared to the natural gas consumption. The remaining 36% of the total amount of energy sources are occupied by solid and liquid fuels, thermal energy from waste incineration etc.

The total energy consumption in the metallurgy was 281.1 thousand tons p.e., by 40 thousand tons p.e. more than in the previous year, and **was 10.3 % from the consumption of the industry (9.1 % in 2016).** After a retention and decline in the energy consumption in the last few years, in 2017 there was a growth by 16% due to the high growth of the production in the same year (an increase by BGN 2.8 billion or 39%).

The energy consumption in the ferrous metallurgy was 118.7 thousand tons p.e. and or 42 % share of the total consumption, and an increase by 7%. The non-ferrous metallurgy accounted for consumption of 162.4 thousand tons p.e. or 58 %, and an increase by 30 %.

The metallurgical industries reported in 2017 the highest consumption of electricity – 157.9 thousand tons p.e., which was 19.5% of the total electricity consumption of the industry, followed by the sector food, beverages and tobacco (107.9 thousand tons p.e.), chemical and petroleum industry (99.2 thousand tons p.e.), and the mining (94.9 thousand tons p.e.).

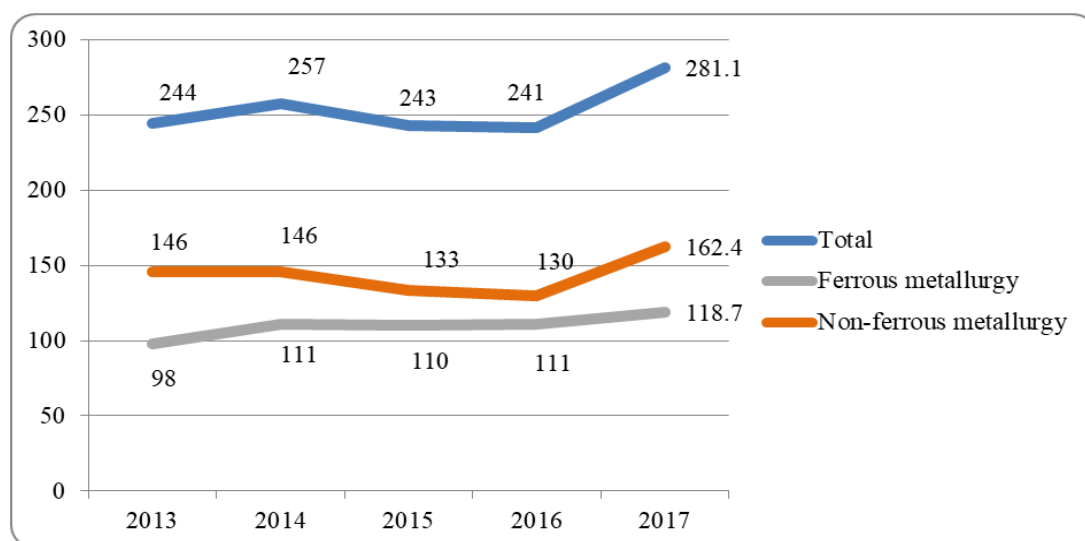
Electricity consumption in non-ferrous metallurgy was 90.2 thousand tons p.e. (an increase by 36.6%), in the ferrous industry it was 67.7 thousand tons p.e. (an increase by 7.6%).

In 2018 the consumption of **natural gas was 89.9 thousand tons p.e.** – an increase by 11%. **The share of the metallurgical industry in the total industry gas consumption was 9.7 % (8.8 % in 2016),** 56% of which were consumed by the ferrous and 44 % - by the non-ferrous industry.

The chemical and petroleum industries are the largest natural gas consumers with a share of 33% (308 thousand tons p.e.) of the total industrial consumption (928.8 thousand tons p.e.), followed by the metallurgy with a share of ca. 10 %.

Figure 1.4 shows the dynamics of the energy consumption in total, and separately for the ferrous and the non-ferrous metallurgy over the last six years.

Figure 1.4



Energy consumption in the metallurgy, thousand tons p.e.

The structure of the energy consumption in the metallurgy is following the development of the ferrous and the non-ferrous metallurgies. The increase of non-ferrous metals and alloys ingots production and their processing leads to a higher growth in the consumption of energy resources, and electricity consumption higher than that of natural gas.

For transportation of large quantities of raw materials and finished products respectively to and from the metallurgical enterprises on the territory of the country, all types of transport are used - rail, road, water transport. **The total freight volumes are between 6.5 - 7.0 million tons**, incl. ca. 1.5 million tons liquid cargo (sulfuric acid). The other over 5 million tons are bulk or different kind of solid products - ores, concentrates and other bulk cargo (ca. 2 million tons), secondary metal raw materials (1 million tons), finished products (ca. 2 million tons of metals and metal products). The biggest part of the cargo is transported by railway.

As a result of the restructuring of the Bulgarian economy over the last 20 years there has been a significant change in the quantities and the type of goods transported. The metallurgical enterprises remained the main shippers for the railway transport in the country, incl. for the state enterprise "BDZ - Freight Transports".

1.4. FOREIGN TRADE EXCHANGE, IMPORT AND EXPORT

The Bulgarian industry is export oriented and the main part of its production is realized on the world and on the European markets.

In 2018 the total export of goods was worth BGN 55.2 billion - the export to EU countries was BGN 37.7 billion - a share of 68% (66% in 2017). There is a steady trend the import of goods to be higher than the export, and so forming a permanent negative trade balance. In 2018 the import increased by 6.2% and the export - by

1.2%, forming a negative balance of BGN - 7.7 billion – an increase by 67% compared to 2017.

Table 1.5 shows the value of the **import and the export of goods** over the last five years, incl. the foreign trade turnover of metallurgical products.

Data about the imported and exported metallurgical products are obtained from official sources by types and quantities – for the ferrous metals data are presented in Section two (Tables 2.3 and 2.4) and for the non-ferrous metals – in Section three (Tables 3.13 and 3.14) of this publication.

Table 1.5

Foreign trade balance in the goods exchange, BGN milliard

Indicators:	2014	2015	2016	2017	2018
Import of goods, incl.	51.2	51.6	51.2	59.2	62.9
from the EU(28)	25.8	27.3	28.0	37,8	39.9
-----	-----	-----	-----	-----	-----
- basic metals and products	3.6	3.5	3.6	4.2	4.3
relative share, %	7.0	6.8	7.0	7.1	6.8
Foreign trade balance, incl.	-7.9	-6.1	-4.0	-4.6	-7.7
- basic metals and products	+2.5	+2.6	+2.8	+5.1	+3.5

Source: BNB/NSI; for import and export of metals – Customs/NRA

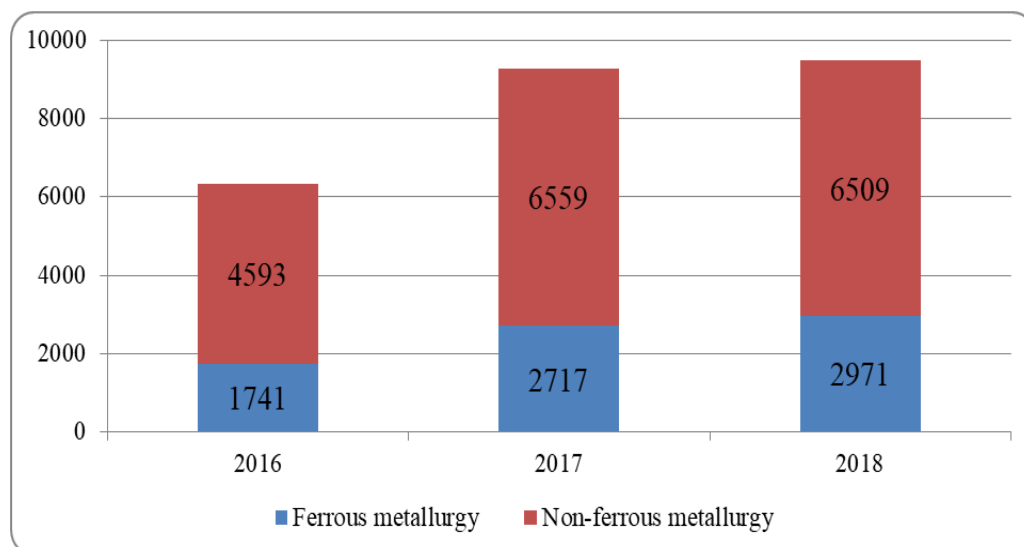
Data presented in the Table confirm both the high contribution of metals to the value of exported goods and the positive impact on the country's foreign trade balance. For 2018, their relative share was 6.8% of total import and **14.1% of export of goods**. In this case the indicators are strongly influenced not only by the physical volumes of the exported goods but by the prices on the world market as far as metals are trade on metal exchange. Despite of significant upsand downs of these prices, there is an unchanging trend the foreign trade turnover of metals to be positive in the range of BGN 3 billion to BNG 5 billion.

According to the standard foreign trade classification (SITC), the following goods have a **positive balance**: "Different finished products" BGN + 3.4 billion; "Food and animals" BGN +1.2 billion and "Articles classified according to the type of material" – BGN +2 billion. The metals are included in this group with a balance of BGN +3.5 billion.

A large negative balance for all periods, incl. the last 2018, is formed in the groups "Machinery and equipment" BGN - 5.2 billion; "Chemicals or similar products" BGN - 3.2 billion and "Mineral fuels" BGN - 3.6 billion.

Figure1.5 shows additional data obtained from BNB/NSI about the import value over the last three years for the group *Non precious metals and products of them* - Section XV of the Customs Duty Tariff (CDT). Data are presented separate for **ferrous metals** (Chapter 72 and 73) and for basic **non-ferrous metals**, products and articles of them - Chapter 74 (Cu), 76 (Al), 78 (Pb), 79 (Zn).

Figure 1.5



Export of non-precious metals and products of them, BGN million

Data about the exported ferrous metals include big quantities of imported in 2014 pipes for the *South Stream* project (re-export). Therefore these data do not present the real amount of the Bulgarian production.

Metallurgy in Bulgaria is characterized by a high specialization in the production of basic non-ferrous metals and alloys, products and articles of them. They are competitive with established positions on the European and world markets due to their good quality. Their high prices contribute to the increased value of non-ferrous metal export, exceeding twice that of the ferrous metals. They also form a high positive foreign trade balance, both in value and in nature.

Data on goods exported over the last five years in million EUR, by groups according to their main purpose, are presented in Table 1.6.

Table 1.6

Foreign trade – export by goods groups, EUR million

Goods groups	2014	2015	2016	2017	2018
Consumer goods, incl.	5736.2	6096.0	6465.0	6848.9	6987.4
• Foods	1196.8	1332.0	1434.7	1649.2	1697.9
• Cigarette	226.0	204.9	149.7	138.4	92.8
• Beverages	85.4	89.5	96.7	102.2	112.5
• Clothes and shoes	1608.6	1582.7	1710.9	1661.4	1614.2
• Pharmaceuticals and cosmetics	928.7	973.8	1007.4	1102.9	1092.8
• Furniture and home interior	880.2	990.3	1038.7	1086.7	1122.1
• Other consumer goods	810.4	922.9	1026.9	1108.2	1255.1
Raw materials, incl.	9121.4	9409.2	9393.7	10878.3	11197.0
• <i>Pig iron, iron and steel</i>	549.2	411.8	402.6	536.2	663.0
• <i>Non-ferrous metals</i>	2231.4	2296.4	1808.0	2820.5	2739.1
• Chemical products	334.7	379.3	325.5	421.7	459.4
• Plastics, rubber	717.9	800.7	846.5	954.5	1005.6
• Fertilizers	191.9	244.0	220.1	214.0	189.7
• Textiles	422.9	477.4	519.6	560.2	592.5
• Raw materials for food production	1844.1	1782.0	2064.0	1893.4	1960.2
• Wood and paper, cardboard	474.7	489.5	496.4	523.2	526.3
• Cement	17.1	24.0	30.7	33.1	23.0
• Tobacco	133.0	126.9	168.2	128.0	118.6
• Other raw materials	2204.5	2377.2	2512.1	2793.5	2919.4
Investment goods, incl.	4302.3	4880.9	5764.4	7023.2	7115.8
• Machines, apparatus	1208.6	1248.6	1334.3	1557.7	1638.2
• Electrical machines	502.4	557.7	685.0	815.4	1009.0
• Vehicles	410.1	473.4	516.5	635.2	579.2
• Spare parts and equipment	1149.1	1270.7	1414.9	1573.5	1756.6
• Other investment goods	1032.0	1330.6	1813.7	2441.4	2134.8
Total non-energy goods, incl.	19159.9	20386.1	21623.2	24750.4	25300.2
Total energy resources	2911.2	2554.8	2456.0	3109.2	2887.8
• Petroleum products	2368.7	1903.6	1703.5	2258.9	2066.1
• Other non-petroleum products	542.5	651.3	752.5	850.3	821.7
Incl. electricity				487.6	441.2
Other	33.9	41.3	46.8	56.2	59.3
Export total	22105	22982	24126	27915.8	28247.3

Source: BNB

The sum of exports of ferrous and non-ferrous metals does not include all CDT groups, some of them are transferred to "other raw materials", and so it differs from this presented in Table 5.

Nevertheless, it is an indisputable fact that in 2018 **the ferrous and non-ferrous metallurgy realized the highest total exports of all goods groups, exceeding EUR 3.4 billion**, with an increase in ferrous metals and a small decrease in the non-ferrous. This conclusion is confirmed by all statistics, despite the insignificant differences.

1.5. METALLURGICAL INDUSTRY IN EU AND IN BULGARIA

The metals, alloys and their products are the first and most important raw material in the value added chain in the processing industry, needed for all branches of industry and households. The emerging economy, the increasing degree of digitization and the transition to Industry 4.0 do not reduce the role of metals in these processes and require higher quality characteristics of them. Metals are high recyclable and this allows their multiple processing and an almost endless cycle of use, so they are the basis of the circular economy, with the aim to preserve the world resources and the nature.

Asia, mainly China is the largest producer and consumer of all basic metals. In 2018, China's **crude steel** accounted for 51.3% of the world production (50.3% in 2017) - an increase by 6.6%. India follows with a share of 5.9%, Japan - 5.8% and the USA as fifth with a share of 4.8% but with an increase by 6.2% - the highest after China.

As a total the EU is ranking second with a share of 9.3 % (9.7 % in 2017). The biggest producer within the EU is Germany but its annual production decreased by 2 %.

The high growth in the US and the decrease in the EU could also be seen as a result of the imposed by the USA administration import duties on steel products which have a negative impact on European producers and the ineffective reciprocal measures adopted by the EU.

Asia is ranking first in the non-ferrous metallurgy as well, with a share of 56% of the world copper production, 62 % of the lead and 63 % of the zinc production. **China is the biggest producer with a share of ca. 50%.**

The EU and America follow in the ranking of basic non-ferrous metal producers. By regional distribution, USA ranks second in the copper production (20%) and lead (18%), and third in zinc (16%).

The **EU(28)** produced 16% (an increase by 3.4%) of **the zinc in the world and so is ranking second, 11%** (a decrease by 1.4%) of **the copper ranking third** and 15% (a decrease by 1.5%) of the lead.

According to EUROSTAT preliminary data in 2017 the EU's produced output related to the NACE **C.24. Production of basic metals** was worth EUR 348 472 million – an increase by 11.7% compared to 2016.

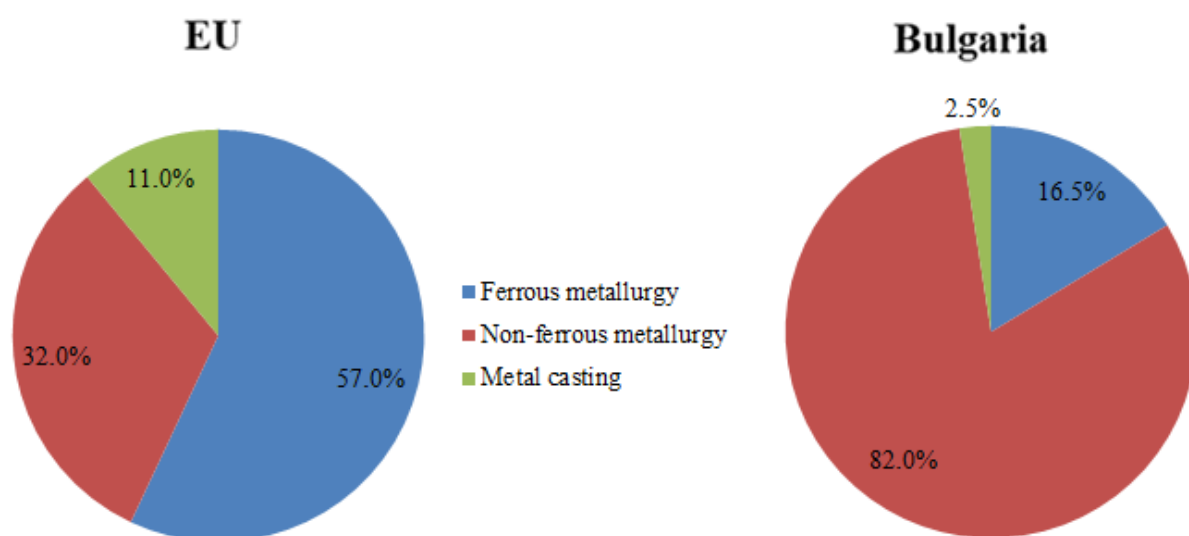
Within the EU Bulgaria is reporting total metallurgy production worth EUR 4 888 million or 1.4 % (1.12% in 2016) of the total for the EU.

In 2017 the EU produced ferrous metals and R/P products worth EUR 198.2 milliard (EUR 170.7 milliard in 2016), non-ferrous metals worth EUR 111.1 milliard (EUR 102.5 milliard in 2016) and casted metals worth EUR 39.1 milliard (EUR 37.6 milliard in 2016).

The EU metallurgical production is characterized by a significantly larger volume of ferrous metal products - almost twice as much as of non-ferrous. In Bulgaria this ratio is quite the opposite – ca. 4 times in favor of the non-ferrous metallurgy.

Figure 1.4 shows the ratio between the sub-sectors in the EU(28) and in Bulgaria, according to EUROSTAT data for 2017.

Figure 1.4



Structure of CEA 24. Production of basic metals in EU and in Bulgaria (by production value)

The data show that the **Bulgarian production of metal ingots (copper, zinc, lead) and R/P non-ferrous metals and alloys has a high contribution not only to the national economy but also to the EU production.**

In 2018 the Bulgarian metallurgy produced 8.5 % of the electrolytic copper, 16.5 % of the anodic copper, 6 % of the lead, and ca. 4 % of the zinc of the EU.

The investments made in 2018 only in the main metallurgical and by-products production sides exceed BGN 150 million. The projects implemented are leading to cost reductions, increased processing of secondary raw materials and waste, energy efficiency, production of new high value added articles, improvement of the working environment.

As a result, improved were the production indicators corresponding to the best world practices, the Bulgarian metallurgy become competitive and with a development potential, significant for the national and the European economy.

SECTION TWO

FERROUS METALLURGY IN BULGARIA

2.1 PRODUCTION OF FERROUS METALS AND ROLLED FERROUS METALS

2.1.1. STEEL PRODUCTION IN 2018 IN THE EU AND IN THE WORLD

Steel and ferrous metal products are the most widely used in all areas of human activity. They are a basic material in the production of machinery, equipment and tools, in the automotive and transport machinery, in construction and energy sector. Every day life of the modern people is unthinkable without products made of steel and ferrous metals as they are an integral part of the world around us. This makes the production of the steel sector important for any country, regardless of its economic structure and development. As a matter of fact the steel production is widespread across regions and countries all over the world, making the sector highly sensitive to markets, fair competition and free trade rules. It is the focus of attention and protection of many governments around the world.

In 2018 the total world production of crude steel was 1 789 million tons – compared to the previous year it increased by 100 million tons. China is still keeping its leading position with share of 51.2 % from the world steel production. In terms of volume EU(28) is ranking second with production of 168.1 million tons, followed by India – 106.5 million tons, Japan – 104.3 million tons, USA – 86.7 million tons and Russia - 71.7 million tons.

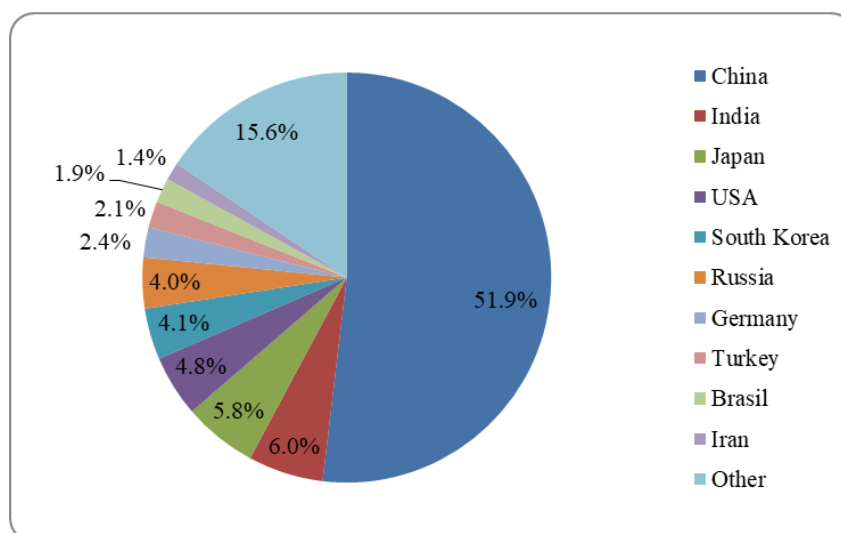
Within Europe beside the EU member states large producers are Russia – 71.7 million tons, Turkey – 37.3 million tons, and Ukraine – 21.1 million tons.

The following table and Figure 2.1 show the leading producer of crude steel in the last two years and their relative share from the world production:

Country	Thousand tons		2018/17 %
	2017	2018	
China	870.9	928.3	6.6
India	101.5	106.5	4.9
Japan	104.7	104.3	-0.3
USA	81.6	86.7	6.2
Republic of Korea	71.0	72.5	2.0
Russia	71.5	71.7	0.3
Germany	43.3	42.4	-2.0
Turkey	37.5	37.3	-0.6
Brazil	34.4	34.7	1.1
Iran	21.2	25.0	17.7

Source: WSA

Figure 2.1



Main world producers of crude steel, by countries, million tons, 2018

The world's largest steel producers are corporate structures, for 2018 they report crude steel production as follows:

1. Arcelor Mittal – 96.4 million tons
2. China Baowu Group – 67.4 million tons
3. Nippon Steel Corporation – 49.2 million tons
4. HBIS Group – 46.8 million tons
5. POSCO – 42.9 million tons
6. Shagang Group – 40.7 million tons
7. Ansteel Group – 37.4 million tons
8. JFE Steel – 29.1 million tons
9. Jianlong Group – 27.9 million tons
10. Shandong Group – 27.3 million tons

The crude steel produced within the EU in 2018 was 168 072 thousand tons – compared to the previous year there is a decrease by 403 thousand tons. Germany occupies the leading position with 42.4 million tons crude steel produced but accounting in the same time a decrease by 2 %. Italy ranks second and is the only in the EU reporting a growth - in 2018, the country produced 24.5 million tonnes of liquid steel, an increase by 1.7% compared to 2017. The total value of steel production, despite the fall in items of nature, is the result of the innovative policy of the European steelmakers. Stability is achieved of important sectoral indicators - productivity, competitiveness, employment, etc.

The European steel industry is a world leader in innovations for sustainable and ecological development. It is securing ca. 320 000 highly qualified jobs and indirect other more than 2.0 million jobs.

In 2018, the leading producers among the **EU member states** with a relative high share of the total crude steel production are as follows:

1. Germany – 25.3 % (42.4 million tons)
2. Italy – 14.6 % (24.4 million tons)
3. France – 9.2 % (15.4 million tons)
4. Spain – 8.5 % (14.3 million tons)
5. Poland – 6.0 % (10.2 million tons)
6. Belgium – 4.8 % (8.0 million tons)
7. UK – 4.6% (7.7 million tons)
8. Austria – 4.1% (6.9 million tons)

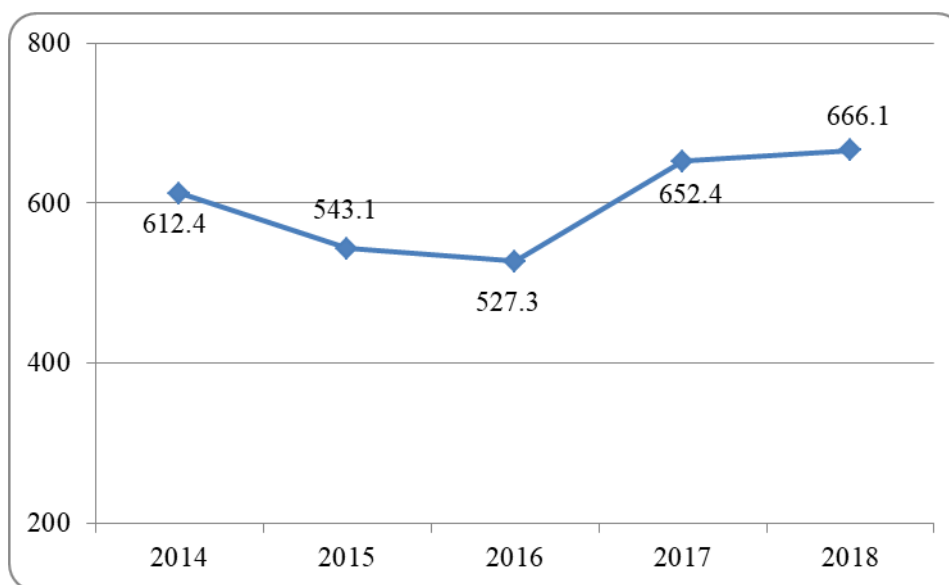
The closure of capacities for liquid steel in Bulgaria has placed our country in the group, of the small producers and the Bulgarian production is comparable to the production of Slovenia (ca. 654 thousand tons). The production in the two neighbor countries – Romania and Greece (1.5 million tons) is significantly higher. Among the “new“ CEE countries leader is Poland - with an annual production of over 10 million tons, followed by Slovakia – 5.2 million tons and the Czech Republic – 5.0 million tons.

In 2018 Bulgaria's share of the EU liquid steel production was 0.3 %.

2.1.2. CRUDE STEEL PRODUCTION IN BULGARIA

In Bulgaria only “Stomana Industry“ JSC is producing crude steel - in electric furnaces from scrap. In 2018 the quantity of crude steel produced was 666.1 thousand tons – this is an increase of 13.7 thousand tons compared to 2017 (Figure 2.2).

Figure 2.2



Liquid steel production in Bulgaria, thousand tons

After continuous casting the produced liquid steel passes for further processing in hot rolling mill for flat and long products as well as different types of articles from

them. The investment policy and objectives of “Stomana Industry“ JSC are aimed at improving the quality of furnace scrap, improving melting processes, energy efficiency, high quality, ensuring good and safe working conditions, protecting the environment.

The total investments in the enterprise, incl. the luding steel extraction and the following metal processing, are worth over BGN 500 million.

2.1.3. PRODUCTION OF ROLLED FERROUS METALS

In Bulgaria producers of rolled ferrous metals (RFM) are “Stomana Industry“ JSC in Pernik and “Promet Steel“ JSC in Bourgas. Flat HR metals are produced only by “Stomana Industry“ JSC; long HR metals are produced by the both companies.

The total production of rolled ferrous metals (RFM) in 2018 in Bulgaria was 1 130.9 thousand tons - compared to 2017 there was an increase by 220.1 thousand tons or by 1.2%; 857.9 thousand tons of those were long rolled products (75.9%) and 273 thousand tons - flat rolled products (24.1%).

In 2018 an increase was reported both by the flat rolled steel by 9.1 thousand tons (3.5%) and by the long rolled steel – by 211 thousand tons (32.6%), compared to the previous year 2017.

Data for the last several years are shown in Table 2.1. and Figure 2.3.

Table 2.1

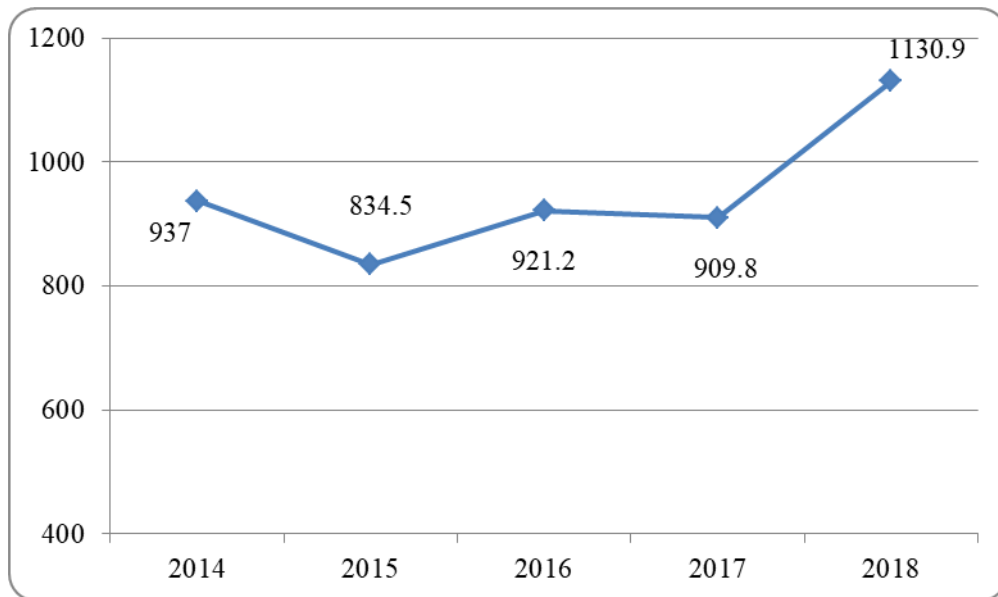
Production of rolled ferrous metals (RFM) by assortment, thousand tons

RFM assortment	Companies	2014	2015	2016	2017	2018	2018/17 +/-	2018/17 %
HR long	“Promet Steel”JSC	343.6	329.1	417.1	262.9	458.6	195.7	142.3
	“Stomana Industry” JSC	286.4	292.5	322.0	383.0	399.3	16.3	104.2
	Total	664.0	621.6	739.1	646.9	857.9	211.0	132.6
HR flat	“Stomana Industry” JSC	273.0	212.9	182.1	263.9	273.0	9.1	103.5
HR metals total	“Promet Steel”JSC	343.6	329.1	417.1	262.9	458.6	195.7	174.4
	“Stomana Industry” JSC	559.4	505.4	504.1	646.9	672.3	25.4	103.9
Total		937.0	834.5	921.2	909.8	1130.9	220.1	132.6

Source: Company data

There was a significant increase in the production of long rolled steel in “Promet Steel“ JSC - by 195.7 thousand tons (42.4%). “Stomana Industry“ JSC reported a growth both in the long HR steel and in the flat HR steel by 16.3 thousand tons and by 9.1 thousand tons respectively or a total increase by 25.4 thousand tons.

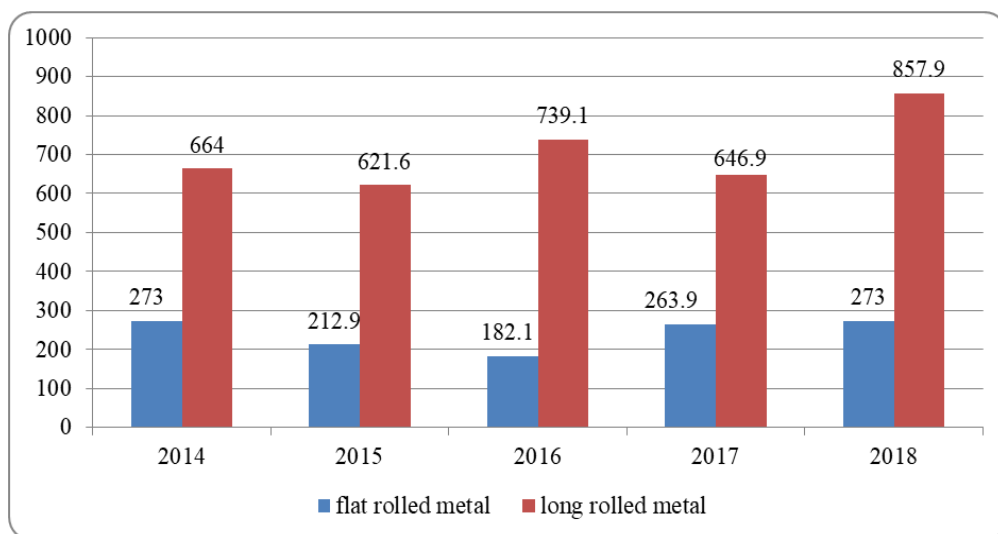
Figure 2.3



Production of flat and long rolled metals, thousand tons

The graph in Figure 2.4 is showing the production of long and flat rolled metals in the country over a five years period.

Figure 2.4



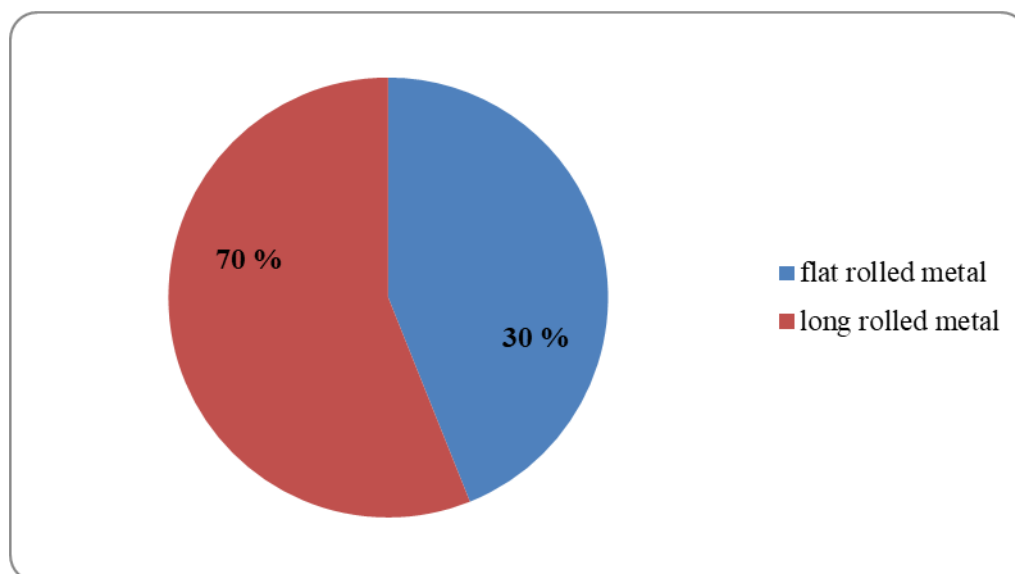
Production of flat and long rolled metals, thousand tons

It is obvious that the production of a long HR metals exceeds that of the flat HR metal 2 to 3 times. This is due to the difference in capacity of the existing capacities in the country. Even in the “Stomana Industry“ JSC, both the productions infrastructure and the production of long exceeds that of the flat HR metals.

Another limiting factor is the production portfolio, which can not meet the needs of the home market and to expand the export potential.

The ratio between the two types of HR products for 2018 is shown in Figure 2.5.

Figure 2.5



Production of flat and long rolled metals, 2018, %

2.1.4. PRODUCTION OF ROLLED FERROUS METAL ARTICLES

Articles of rolled ferrous metals in Bulgaria are produced from own raw materials (long rolled), as well as from imports of sheets, strips and wire rod. According to the data provided by the BAMI member companies, in 2018 the production marks an increase compared to 2017. The data are presented in Table 2.2. The highest increase reported the production of steel balls – by ca. 50%, a significant increase could also be seen in the welded pipes produced by PIH Industry AD - by 29 %.

Table 2.2

Production of RFM articles by companies, thousand tons

Articles	Company	2014	2015	2016	2017	2018	2018/17 +/-	2018/17 %
Steel pipes, welded	“PIH Industry” JSC	48.8	48.0	50.8	33.1	42.6	9.5	128.7
Steel balls for mills	“El Stomana” JSC	17.2	29.4	19.9	14.4	21.5	7.1	149.3
Wire and wire articles	“ZHITI” JSC	13.2	12.0	13.1	14.5	10.4	- 4.1	71.7
Total RFM articles		79.2	89.4	83.8	62.0	74.5	12.5	120.2

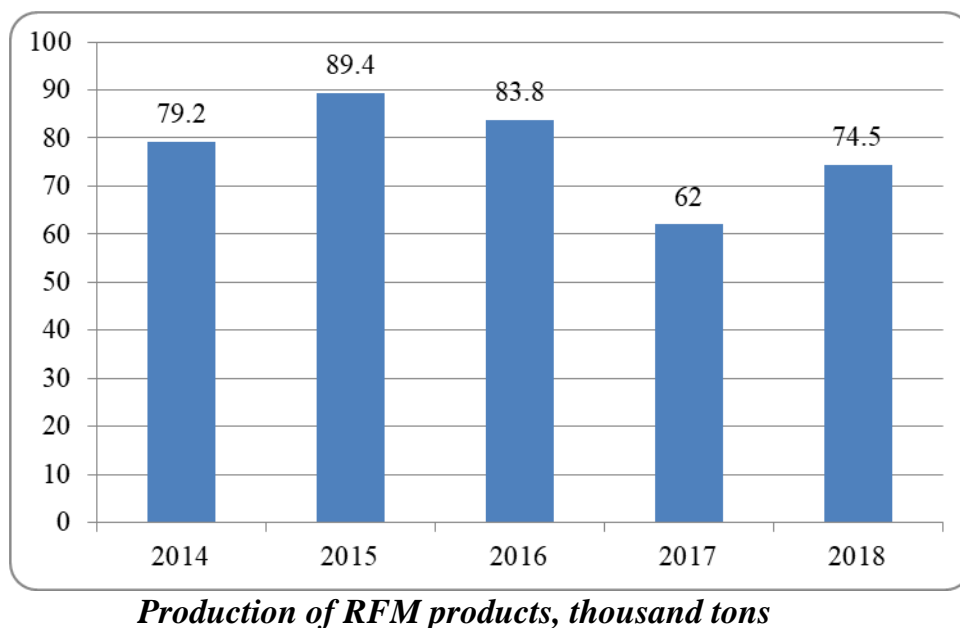
Source: Company data

The information presented is only for RFM production reported from companies of the BAMI-structure. In the country there are other big manufacturers of welded pipes and different steel articles, too.

Steel balls for mills are produced only by “El Stomana“ JSC, but the production infrastructure and the slugs are supplied by “Stomana Industry“ JSC.

The largest enterprise for wire and wire articles is ZHITI JSC, Rousse.

Figure 2.6



The graph in Figure 2.6 presents the quantities of steel articles produced by companies BAMI-members over the last five years. They are other companies with higher producing capacities - mainly for welded pipes. Their production reaches 250 thousand tons and exports – more than 150 thousand tons per year.

2.2. TRADE TURNOVER AND CONSUMPTION OF RF METALS AND PRODUCTS OF THEM

2.2.1. IMPORT OF SCRAP, RFM AND PRODUCTS

The total quantity of rolled ferrous metals (RFM) and products of them imported in 2018 incl. scrap, reached **2 064.8 thousand tons**. Compared to 2017, the imported quantities show an increase by **165.2 thousand tons (8.7%)**.

Table 2.3 shows the quantities of imports by good's groups.

Despite the increased quantities of imported metal products, **their value is lower by BGN 97.8 million reaching BGN 2 333.3 million compared to the previous year**. The decrease in volume is due to two positions – the semi-products for the production of long RFM in “Promet Steel“ JSC and the import of welded pipes.

The analysis shows that the difference is a result of the reduced imports of finished products at the expense of the imported raw materials for the Bulgarian producers - semi-products/slugs for “Promet Steel“ JSC and ferrous metals scrap for “Stomana Industry“ JSC and so the total value is decreasing.

Table 2.3

Import of ferrous metals and products of them, thousand tons

Goods:	2014	2015	2016	2017	2018	2018/17 +/-	2018/17 %
Non-alloyed - total	1 233.5	1 455.2	1 545.2	1 506.6	1 735.0	228.4	115.2
Pig iron - ingots, granules, powder	15.7	19.7	15.2	16.8	15.7	- 1.1	99.9
Ferroalloys	16.5	13.8	11.4	15.7	15.5	- 0.2	98.7
Scrap	115.5	105.2	94.5	101.3	166.0	64.7	163.9
Semi-finished products	338.4	372.8	482.4	367.6	540.1	172.5	146.9
HR metal (coil and sheet)	361.9	492.2	511	509.8	494.6	- 15.2	97.0
CR metal (coil and sheet)	113.1	122	122.1	135.4	121.7	- 13.7	89.9
Rolled wire	114.3	118.2	120.5	126.8	171.6	44.8	135.3
Bars	97.3	141	113.9	157.5	120.5	- 37.0	76.5
Profiles	60.8	70.3	74.2	75.7	89.3	13.6	118.0
Alloyed - total	75.5	72.2	83.9	94.6	64.8	- 29.8	68.5
HR and CR coils and sheets	43	39.8	43.5	54.1	28.0	- 26.1	51.8
Bars and profiles	32.5	32.4	40.4	40.5	36.8	- 3.7	90.9
RFM products	664.2	322.7	447.7	298.4	265.0	- 33.4	88.8
Seamless pipes	30.1	28.2	33.8	36.5	41.7	5.2	114.2
Welded pipes	470.2	112.5	218.1	46.8	34.0	- 12.8	72.6
Coated sheets	133.4	154.1	168.3	190.8	185.9	- 4.9	97.4
Wires, ropes etc.	30.5	27.9	27.5	24.3	3.4	- 20.9	186.0
Total:	1 973.2	1 850.1	2 076.8	1 899.6	2 064.8	165.2	108.7
Value, EUR million	1 340.8	9 85.1	1 080.2	1 143.1	1 193.0	49.9	104.4
Value, BGN million	2 622.4	1 926.7	2 112.7	2 235.5	2 333.3	97.8	104.4

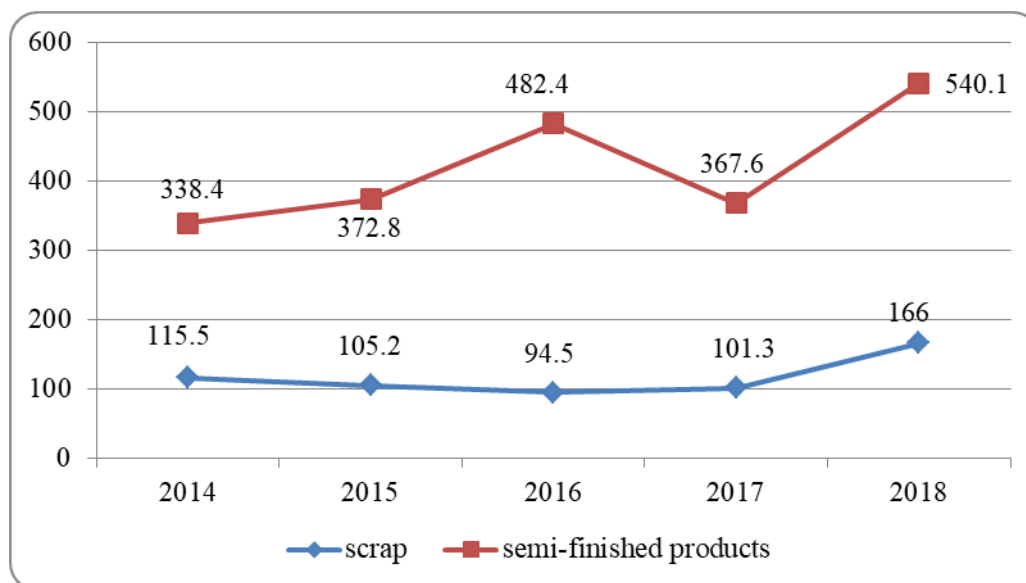
Source: Customs statistics, NRA

By product groups, the analysis shows the following trends:

✓ In 2018, 166.0 thousand tons of ferrous metals scrap were imported - the only raw material for the production of crude steel. Compared to 2017, there was an increase by 67.7 thousand tons (163.9%). This compensated the reduced internal supply. Secondary ferrous metals are traditionally imported from Romania and Serbia - in 2018 from these countries imported were respectively 107 thousand and 39 thousand tons. Small quantities were imported from Russia, Greece and Macedonia as well.

✓ The quantity of imported by Promet Steel **semi-finished products** exceeded that in the last years and is corresponding to the increase of the produced long rolled steel during the year. Raw materials are imported from Ukraine and the sources are companies from the holding structure Met Invest, the owner of "Promet Steel" JSC in Bulgaria.

Figure 2.7



Import of scrap and semi-finished products, thousand tons

Figure 2.7 shows the clear trend of increased imports of scrap and semi-finished products for the ferrous industry in the country. After processing to products with new value added they are realized on the home and the international markets.

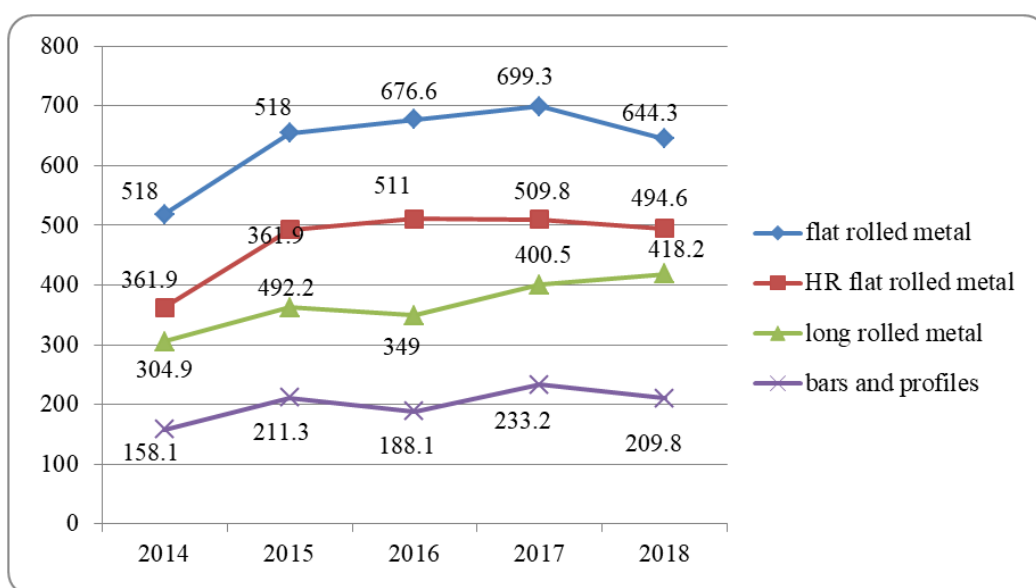
Figure 2.8 illustrates the import of the both basic RF metal products which are produced in Bulgaria, too – of flat rolled meta ls (total quantity and only HR products from unalloyed steel) and of long rolled metals (incl. from alloyed steels).

In 2018 imported were 644.3 thousand tons flat HR and CR alloyed and unalloyed steel as total – by 55.0 thousand tons less than in 2017. The quantity of **unalloyed HR products – coils and sheets was 494.6 thousand tons**. They build the biggest good's group of all ferrous metals imported, with relatively constant quantities over the last three years. Imports in 2018 were from Serbia - with a share of 38%, and from Turkey and Romania - by 20% each. In previous years the main importer was Ukraine.

In general CR metals are not produced in the country, but the import of these metals in relatively small – ca. 120 thousand tons.

✓ The total export of long rolled alloyed and unalloyed steel was 411.2 thousand tons – an increase by 17.7 thousand tons compared to 2017. The import of **unalloyed steel bars and profiles was 209.8 thousand tons** – a decrease by 23.4 thousand tons compared to 2017.

Figure 2.8

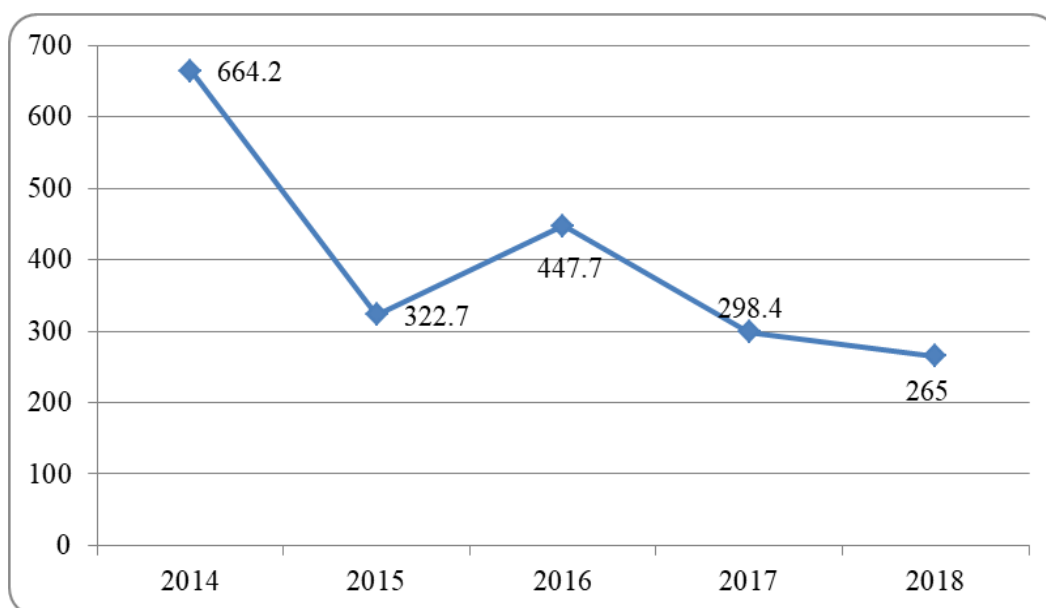


Import of flat and long rolled metal, thousand tons

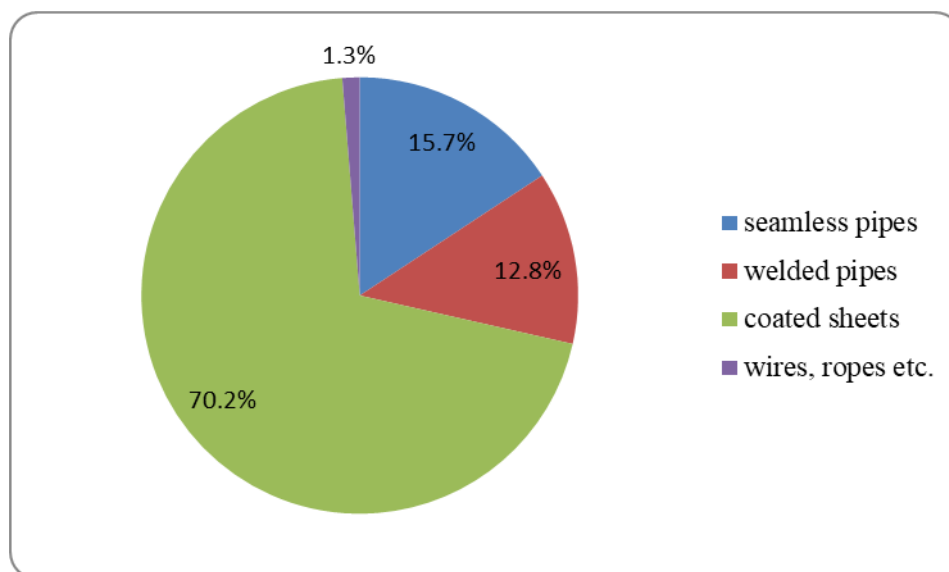
In 2018 imported were total **265.0 thousand tons rolled ferrous products** – a decrease by 33.4 thousand tons compared to 2017. Figure 2.9 shows how these quantities differ in the last five years. The peak reached in 2014 was due to the imported gas pipes for the not realized *South Stream* project.

The highest import is reported by the coated sheets - 185.9 thousand ton , but in the same time with a decrease by 5 thousand tons (97.4 %) compared to 2017.

Figure 2.9



Import of RFM products, thousand tons



Import of metal products by articles, 2018

Figure 2.10 shows the structure of metal product's import in the last year. The ratio between the different products is corresponding with the traditional imports according to the needs of the industry. Big are the shares of the coated sheets and the seamless pipes – both products are not produced in Bulgaria.

2.2.2. EXPORT OF SCRAP, RFM AND PRODUCTS

Data on the export of the basic FM and articles for the last five years incl. the changes in comparison to 2017 appear in Table 2.4.

In 2018 the total quantity of exported metal raw materials (scrap, ingots, semi-finished products), R/P metals and products was 1 503.0 thousand tons – a decrease by 234.7 thousand tons (32.0%) compared to 2017.

The Bulgarian producers accounted in the export of HR products (bars/profiles) an increase by 120 thousand tons (30 %). In all other groups the export is decreasing but these are not Bulgarian products – rolled metals and alloyed steel products, seamless pipes, coated sheets etc.

In terms of value, the export of ferrous metals in 2018 also decreased - by BGN 384 million or ca. EUR 200 million. These differences both in terms of nature and in value are due to the export of gas pipes.

Table 2.4

Export of ferrous metals and products, thousand tons

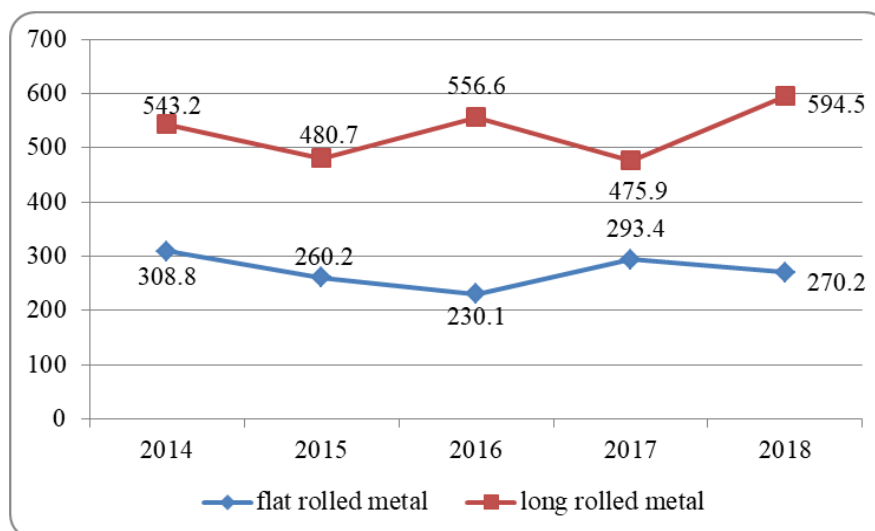
Goods:	2014	2015	2016	2017	2018	2018/17 +/-	2018/17 %
Non-alloyed - total	1 224.4	937.5	1 007.2	1 123.9	1190.7	66.8	105.9
Pig iron - ingots, granules, powder	1.9	0.8	26.2	8.2	6.3	- 1.9	76.8
Ferroalloys	4.3	2.4	1.3	1.8	3.6	1.8	200.0
Scrap	399	239.7	241	398.9	381.0	- 17.9	95.5
Semi-finished products	6.3	2.3	4.6	2.0	0.2	- 1.8	10.0
HR metal (coil and sheet)	291.1	240.5	208.6	275.5	259.6	- 15.9	94.2
CR metal (coil and sheet)	14.9	16.9	17.0	12.7	10.0	- 2.7	78.7
Rolled wire	39.3	27.5	15.7	9.3	2.4	- 6.9	25.8
Bars	423.3	371.7	457.5	378.6	490.8	112.2	129.6
Profiles	44.3	35.7	35.3	36.9	36.8	- 0.1	99.7
Alloyed - total	39.1	48.6	52.6	56.3	65.1	8.8	115.6
HR and CR coils and sheets	2.8	2.8	4.5	5.2	0.6	- 4.6	11.5
Bars and profiles	36.3	45.8	48.1	51.1	64.5	13.4	126.2
RFM products	132.9	182.2	252.6	557.5	247.2	- 310.3	44.3
Seamless pipes	2.8	1.8	2.5	3.1	2.7	- 0.4	98.7
Welded pipes	116	168.8	224.8	519.7	232.8	- 286.9	44.8
Coated sheets	7.5	6.2	11.4	13.6	11.5	-2.1	84.6
Wires, ropes etc.	6.6	5.4	13.9	21.1	0.2	- 20.9	1.0
Total:	1 396.4	1 168.3	1 312.4	1 737.7	1 503.0	- 234.7	- 32.0
Value, EUR million	622.7	503.6	527.3	1 015.5	819.1	- 196.4	80.7
Value, BGN million	1 217.9	985.0	1 031.2	1 986.2	1 602.0	-384.2	80.7

Source: Customs statistics, NRA

The graph in Figure 2.11 illustrates **the export of rolled flat and long metals incl. alloyed.**

Exported were 270.2 thousand tons flat rolled metals - a decrease by 23.2 thousand tons compared to the previous year. The main destinations for the export of flat non-alloyed products in 2018 were the same as in 2017 – mainly Germany, Romania, and Turkey, smaller quantities were exported to other ca. 30 countries among them were Hungary, Algeria, and Greece.

Figure 2.11



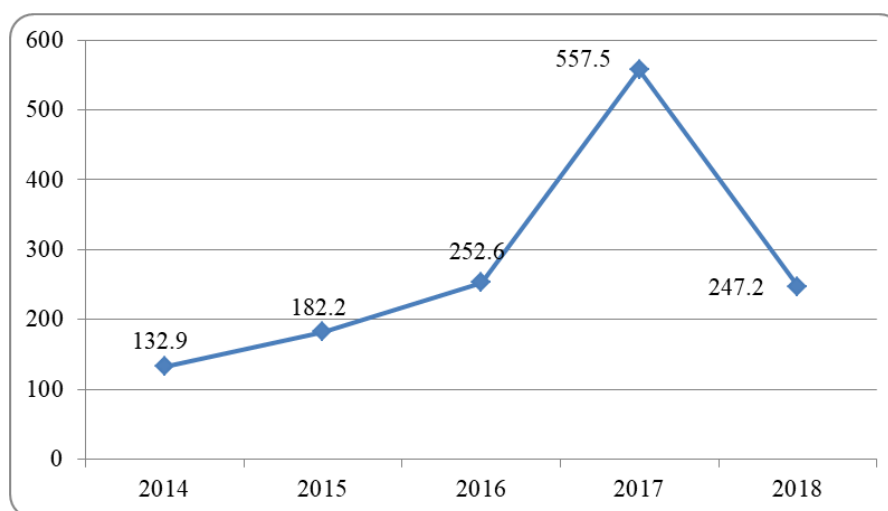
Export of flat and long RFM, thousand tons

In 2018 the export of **long rolled steel** – bars and profiles total was 594.5 thousand tons – an increase by 118.6 thousand tons compared to 2017. The exported non-alloyed bars only (the main product of the Bulgarian steel industry) were 490.8 thousand tons – an increase by 112.2 thousand tons compared to the previous year. The larger quantity was realized in Romania – ca. 50% of the total export, there were exports to the USA – over 10 %.

The exported quantities of **non-alloyed steel profiles** were almost unchanged. The main quantities (ca. 65%) were realized on the markets of the EU member states.

Data presented in Table 2.4 and Figure 2.12 illustrate an uneven export of ferrous metal products over the last five years with a peak in 2017 – in this year the quantities of welded pipes were twice more than in other periods, the quantities were not only Bulgarian production and the reasons for the fluctuation were mentioned above.

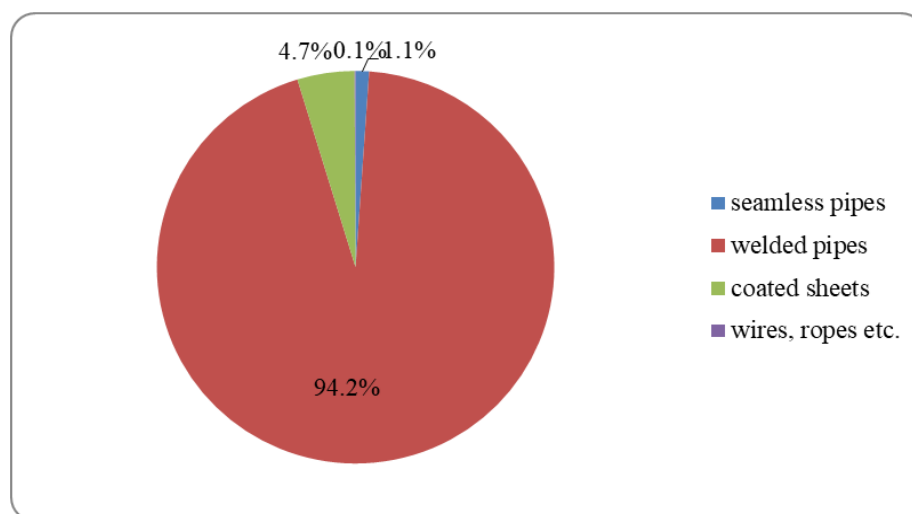
Figure 2.12



Export of metal products, thousand tons

Figure 2.13 illustrates the distribution of the goods group export in 2018. The share of the welded pipes was over 90 % , this ratio was stable over the years and shows the good export potential of welded pipes produced in the country.

Figure 2.13



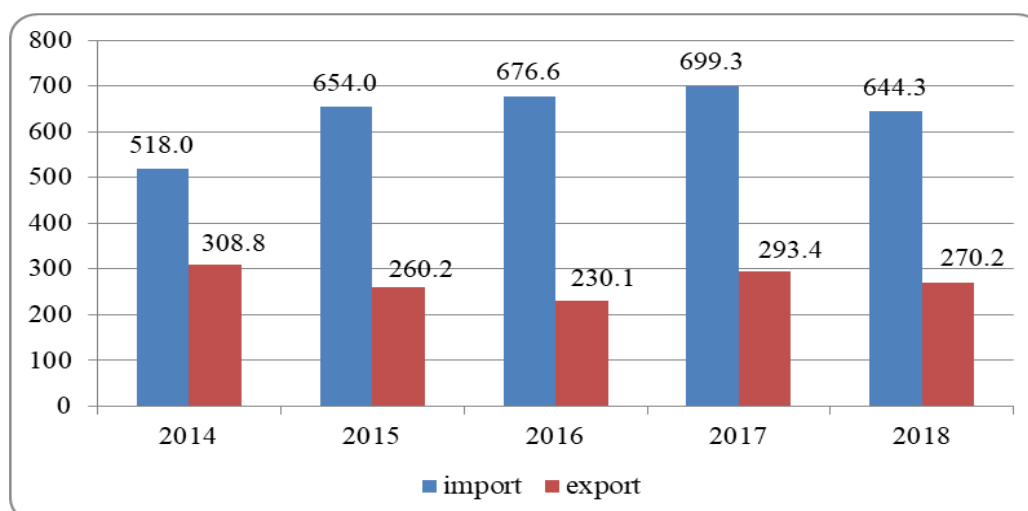
Export of metal products from RFM, 2018

2.2.3. FOREIGN TRADE BALANCE OF ROLLED FERROUS METALS AND FINISHED PRODUCTS

The aggregated data for exported and imported ferrous metals products in terms of nature and in terms of value are characterizing the sector as a net importer with a negative foreign trade balance.

The import and the export of **flat RM** over the period 2014 – 2018 is presented in Figure 2.14. In the last year, there was also a small decrease in the trade turnover - the import was significantly higher than the export over the whole period and in 2018 the difference is ca. 2.5 times.

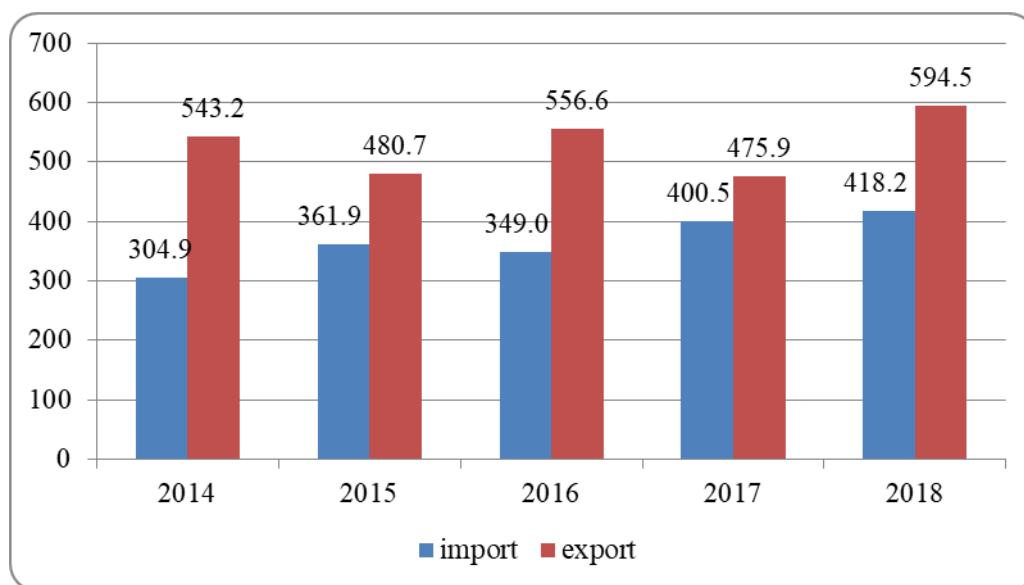
Figure 2.14



Import and export of flat RFM, thousand tons

By the **long RFM** (Figure 2.15) the situation is quite the opposite – the export exceeded the import. Despite the capacity to produce long products in the country, the quantities of some of the imported products are relatively high. Even in 2018, when higher production and exports were reported, the imports were by 18 thousand tons higher. The positive year balance was 176 thousand tons.

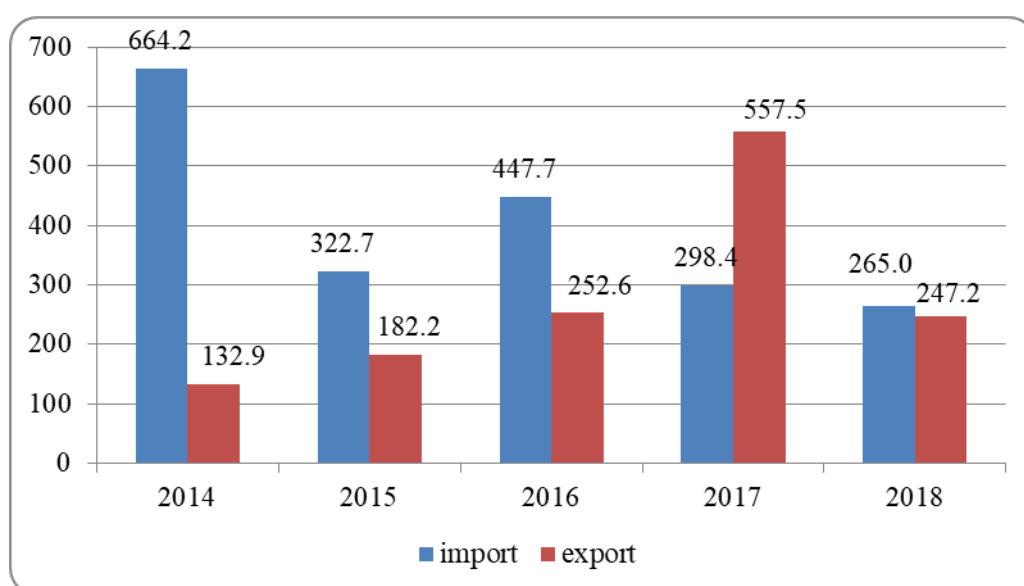
Figure 2.15



Import and export of long RFM, thousand tons

Data presented in Fig. 2.16 on the **import and the export of RFM** illustrate the impact of the welded gas pipes in the previous years . In 2018 this effect is removed and the ratio is as normal for the country.

Figure 2.16



Import and export of RFM products, thousand tons

Table 2.5 presents the aggregated balance between the import and the export of the total raw materials, ferrous metals products and articles forming **in 2018 a negative trade balance by 566.7 thousand tons.**

Table 2.5

Foreign trade turnover of ferrous finished products in 2018

Production:	Export, thousand tons	Import, thousand tons	Difference
Semi-finished products	0.2	540.1	- 539.9
Flat RFM	269.6	644.3	- 372.6
Long RFM	530.0	381.4	148.6
Finished products	247.2	265.0	- 17.8
Scrap	381.0	166.0	215.0
Total	1 428.0	1 996.8	- 566.7

Source: Customs statistics, NRA

In 2018 the balance differs for the different groups, as follows:

- **semi-finished products** – over the years the foreign trade balance is negative and Bulgaria is a net importer of semi-finished products for processing in metallurgical enterprises within the value added chain;

- **flat-rolled and RFM products** – Bulgaria is a net importer and the import also exceeded the export, respectively by 372.6 thousand tons;

- **long RFM and scrap** - in 2018 the export was higher than the import, the positive balance was respectively 148.6 thousand tons and 215.0 thousand tons;

- **RFM products** – the group reported a negative balance by 17.8 thousand t.

In Table 2.6 presented is the foreign trade turnover (in terms of nature) only for the **rolled ferrous metals** - eliminated are data about iron, ferroalloys and scrap.

Table 2.6

Foreign trade turnover of RFM and finished products, thousand tons

Products and articles of RFM	2014	2015	2016	2017	2018	2018/17 +/-	2018/17 %
Rolled ferrous metals							
- import (incl. semis)	1 161.3	1 388.7	1 508.0	1765.8	1 830.8	65.0	103.7
- export (incl. semis)	858.3	743.2	791.3	769	1 047.0	278.0	136.2
Turnover total	2 019.6	2 131.9	2 299.3	2534.8	2 877.8	343.0	113.6
Balance (Export-Import)	-303	-645.5	-716.7	-996.8	- 783.8	- 213.0	137.5
RFM products							
- Import	664.2	322.7	447.7	298.4	265.0	- 33.4	88.8
- Export	132.9	182.2	252.6	557.5	247.2	- 310.3	44.3
Turnover total	797.1	504.9	700.3	855.9	512.2	- 343.7	59.8
Balance (Export-Import)	-531.3	-140.5	-195.1	259.1	- 17.8	-276.9	- 193.1

Source: Customs statistic, NRA

In 2018 the total turnover of rolled ferrous metals, incl. semi-finished products, reached 2 877.8 thousand tons – by 343 thousand tons higher compared to 2017. The negative balance decreased by ca. 200 thousand tons coming to 784 thousand tons.

The turnover of **RFM products** in 2018 was 512.2 thousand tons. Over the mentioned period this group shows a decreased turnover forming a negative trade balance by 17.8 thousand tons.

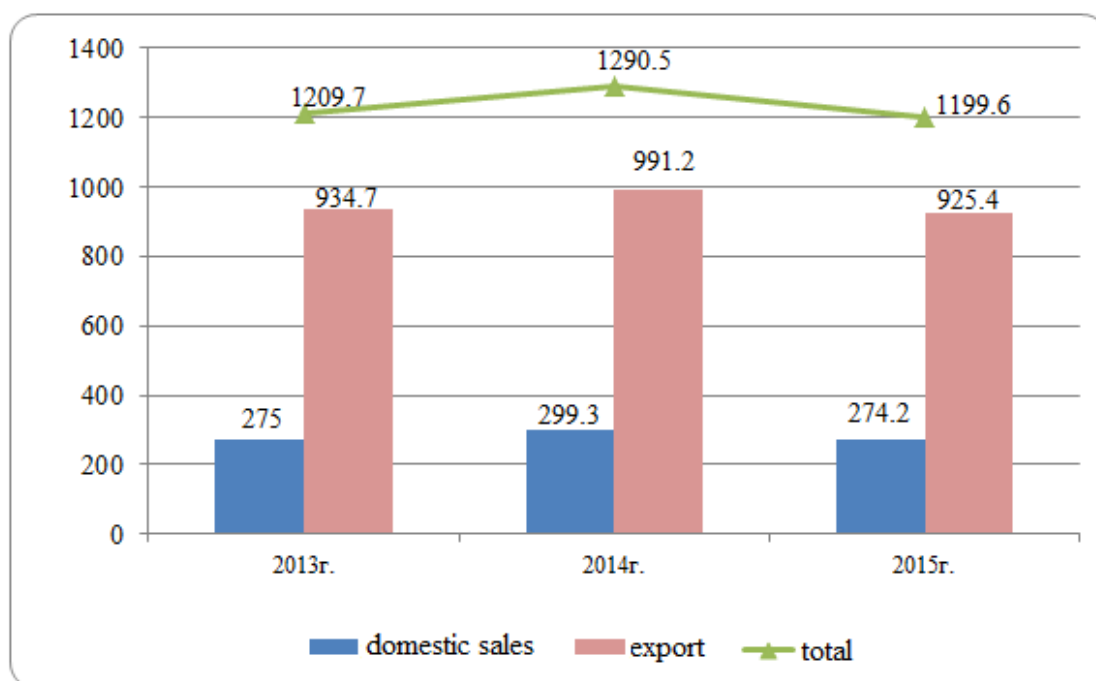
2.2.4. DOMESTIC SALES OF RFM AND FINISHED PRODUCTS

In this chapter data are presented about the total realization of the metallurgical production of the companies BAMI-members, incl. data about products and articles realized on the domestic and international markets. These indicators are relevant for determining the real domestic consumption in the respective period.

In 2018 the Bulgarian enterprises realized on the **domestic market 310.7 thousand tons** ferrous metals and products of them – an increase by 46%, after a decrease over the last three years (by ca. 10 thousand tons per year).

The export in 2018 was growing as well and the total trade turnover of the Bulgarian producers was over 1.2 million tons - the highest value of this indicator over the last five years (Figure 2.17).

Figure 2.17



Domestic sales of RFM and products, 2016-2018*

* Company data

Table 2.7 shows the realization of flat and long RM in 2018 – compared to 2017 it increased by 41.2 %. The home consumption of long and flat products is increasing. The export of long HR products is changing significantly and is demonstrating a growth by 213.4 thousand tons (56%).

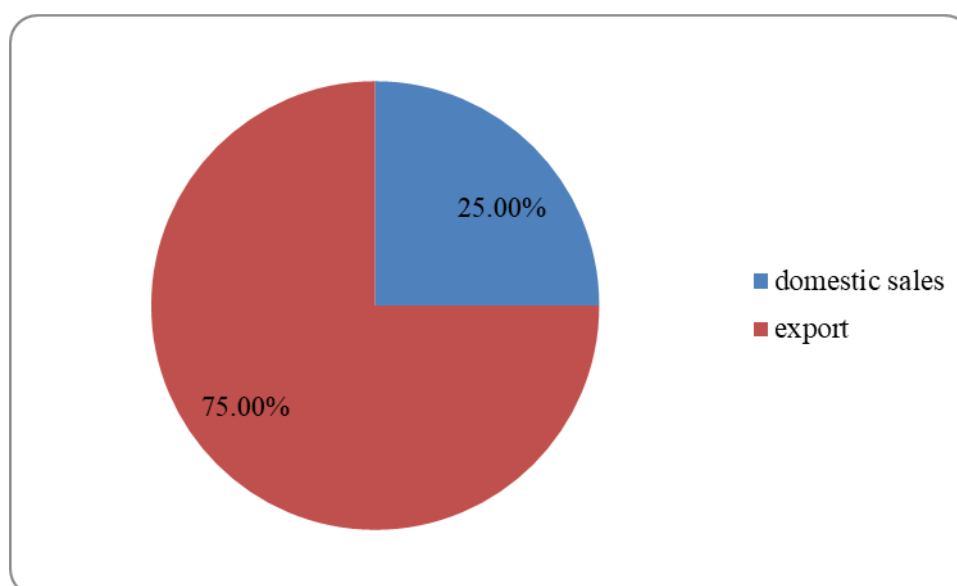
Table 2.7

<i>Realization of rolled ferrous metals (RFM)</i>						
Production	Export		Domestic sales		Realization total	
	2017	2018	2017	2018	2017	2018
Long RFM	411.0	642.4	180.4	270.1	591.4	912.5
Flat RFM	241.9	269.5	32.6	40.6	274.5	310.1
<i>RFM total</i>	<i>652.9</i>	<i>911.9</i>	<i>213.0</i>	<i>310.7</i>	<i>865.9</i>	<i>1 222.6</i>

Source: Company data

The limited domestic consumption of rolled ferrous metals, articles and products from them determines the export orientation of the sector. The existing liberal trade policy and free market, both within the EU and on a regional and global scale, contributes to a highly competitive environment and often there are unfair imports from third countries. This is also an obstacle to the realization of larger quantities on the domestic market. **In 2018, the ratio of exports/realization on domestic market for the basic metallurgical products - flat and long rolled products is 75.0%/25.0%** (Figure 2.18).

Figure 2.18



Realization of RFM products, 2018

2.2.5. REAL HOME CONSUMPTION (RHC) OF STEEL PRODUCTS

The consumption of steel and steel products is an important indicator of the industry status and of its development potential. Changes of this indicator show the trends in the industrial development – growth or decline, and conclusions could be drawn about the structure of the economy in a respective country.

The Real Home Consumption (RHC) of RFM and products is formed by the sum of the realization on the domestic market and the respective import.

Data on RHC in 2017 and 2018 are given in Table 2.8. The quantities imported are according to data obtained from the Customs Agency and the National Revenue Agency (NRA), and the internal realization is based on information from Bulgarian producers

In 2018 the **RHC of steel products was 1 610.1 thousand tons**, almost the same as in 2017 (1 656 thousand tons) – with an insignificant decrease by 46 thousand tons.

Table 2.8

Real home consumption (RHC) of steel products, thousand tons

Products	2017			2018			2018/2017	
	Home sales	Import	RHC	Home sales	Import	RHC	Difference	%
Long RFM	180.4	400.5	580.9	270.1	381.4	651.5	70.6	112.2
Flat RFM	32.6	699.3	731.9	40.6	616.3	656.9	- 75.0	89.8
RFM total	213	1099.8	1 312.8	310.7	997.7	1 308.4	-4.4	99.7
RFM products	44.9	298.4	343.3	36.7	265.0	301.7	- 41.6	87.9
Total	257.9	1 398.2	1 656.1	347.4	1 262.7	1 610.1	- 46.0	97.2

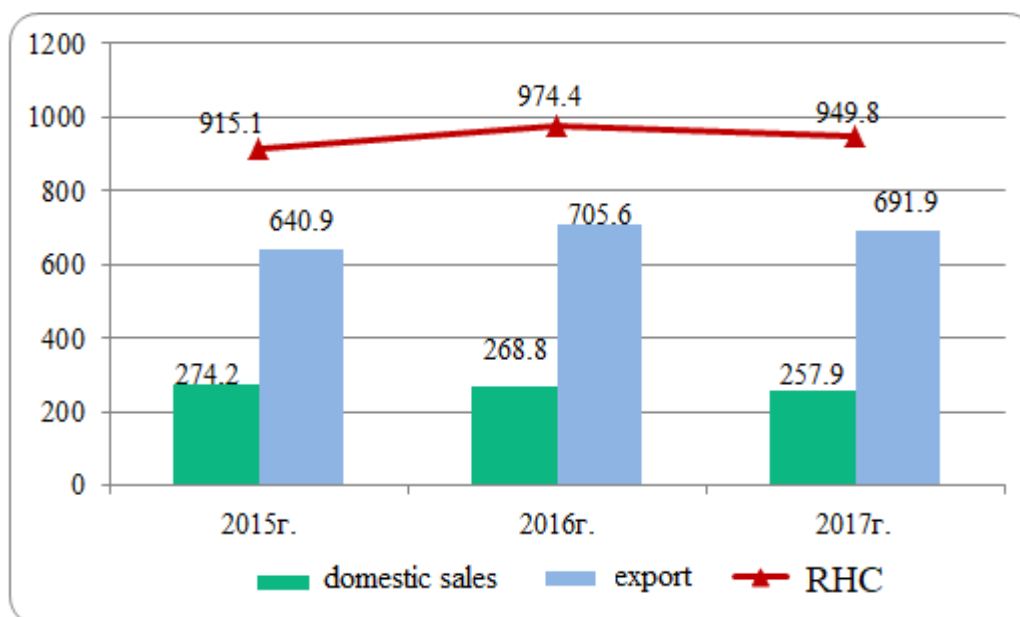
Source: Customs statistics and NRA (Import)

Company data (Local sales)

The relatively close figures about annual consumption of ferrous metals (the main raw material for a large part of the processing industry sectors) are due to the low growth rates of the Bulgarian economy, reaching 2-3%.

An increase of the metal consumption indicators close to the average within the EU could be reached only by a GDP growth by more than 5-6%, when existing production capacities are developing and new are build.

Figure 2.19



Real home consumption (RHC), 2016-2018

The consumption of steel products is also expressed by the so-called Apparent Consumption (AC) calculated by the formula:

$$AC = (M + I) - E, \text{ where}$$

AC – apparent consumption, in thousand tons

M – manufactured steel products, in thousand tons

I – imported steel products, in thousand tons

E – exported steel products, in thousand tons (excluding pig iron, ferroalloys and scrap)

In 2018 the apparent consumption (AC) of steel products in Bulgaria was **1 018 thousand tons** - compared to 2017 the AC is decreasing by 328.5 thousand tons. Here the impact of gas pipes quantities imported and exported during the respective year is obvious.

Table 2.9

Real home consumption of steel products, thousand tons

Year	Production	Import	Export	AC	APCC
2012	895.1	1 028.8	951.8	972.1	133.5
2013	945.1	1 125.9	923.0	1 148.0	157.6
2014	1 016.2	1 487.1	984.9	1 518.4	210.8
2015	953.5	1 338.6	923.1	1 369.0	191.4
2016	1 023.2	1 473.3	1 039.3	1 457.2	205.2
2017	946.6	1 398.2	1 326.8	1 018.0	144.4
2018	1130.9	1327.5	1 111.9	1 346.5	192.4

Source: Company data (Production), Customs statistics (Import and Export)

The apparent per capita consumption (APCC) is another important indicator.

The APCC in Bulgaria is between 150 and 200 kg per capita – the average APCC for the EU(28) was ca.300 kg per capita.

In 2018 the countries with the highest APCC in the world incl EU were:

- South Korea – 1 047.2 kg per capita
- Taiwan (China) – 753.5 kg per capita
- Czech Republic – 703.0 kg per capita
- China – 590.1 kg per capita
- Japan – 514.1 kg per capita
- Germany – 495.5 kg per capita
- Austria – 471.1 kg per capita
- Italy – 445.0 kg per capita

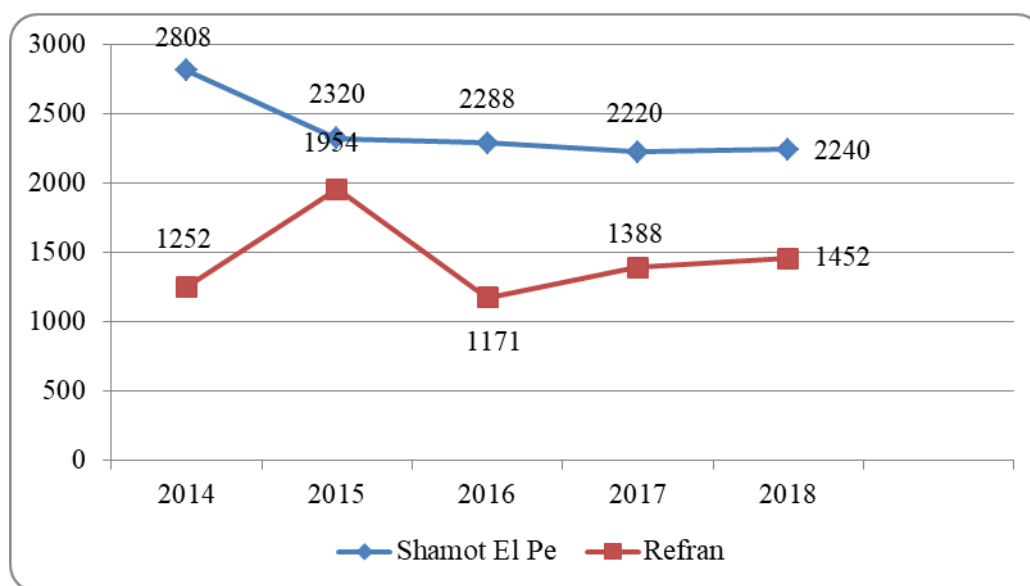
In 2018, the real home consumption (RHC) and the apparent consumption (AC) of steel for Bulgaria show different but relatively close values. The apparent consumption is more important because into account are taken not only the domestic realization of the producers but also the influence of various factors - stocks, re-exports etc. Both indicators illustrate the real trend of decline or growth in the consumption over a period of time - an indicator characterizing the structure of the country's economic development.

In 2018 the world steel consumption was 1 712.1 million tons, compared to 2017 with an increase by 79.6 million tons (104.8 %). The highest consumption reported China – 835 million tons. The steel consumption in the EU was 169.7 million tons – an increase by 7.0 million tons (104.3 %). Within the EU the highest consumption reported Germany – 40.8 million tons, followed by Italy – 26.4 million tons and Poland – 14.9 million tons.

2.3. PRODUCTION OF REFRACTORY MATERIALS AND ARTICLES

The production of refractory and refractory materials is an activity directly related to the metallurgical industry. The main suppliers of refractory materials for lagging and coating of furnaces and aggregates for casting, storing and spilling of liquid metal are the companies “Shamot EL PE 2007” Ltd. and “Refran” Ltd., both are BAMI-members. Data on the refractory and refractory materials produced by them are given in the figure below:

Figure 2.20



Production of refractory materials, tons

The quantity of refractory materials produced in 2018 by the enterprises was 3 692 tons, both companies reported a total increase by 84 tons (4.3%) compared to the previous year. The production is mainly for internal consumption depending of the construction and repair activities of furnace aggregates in the metallurgy and energy.

"Refran" Ltd. is specialized in the production of high-value technological refractory products which the enterprise is using in reparation of melting furnaces in the metallurgy and energy. The implementation of projects under "Innovation and Competitiveness" and "Human Resources Development" (2014-2020 programming period) is ongoing. In 2018 a dust extraction installation for the production of non-formed refractories was installed, new milling crushers for refractory regeneration were installed and so the working environment is improved.

The company operates as a circular economy system regenerating used refractories as main raw material, reducing the consumption of natural resources and contributing to the environment protection.

2.4. METAL CASTING

The castings of ferrous and non-ferrous metals and their alloys belongs to the metallurgy. In the country there is a foundry infrastructure with a capacity exceeding the domestic needs. The preservation and development of the casting enterprises depend on their competitiveness and ability to emerge on external markets. The domestic consumption is low due to limited machine-building capacity, the production of which requires cast parts and details. Nowadays the main activity is related to the production of spare parts for the industry, separate facilities and some household goods.

BAMI-members reporting under NCEA 24.5. "Metal casting" are: "Berg Montana Fittingi" PJSC, "BMB Metal" Ltd ("Chugunoleene - Ichtiman), "Casting, Forging Mashinery Complex" Ltd., "Chugunoleene - Parvomay" AD and IPO Ltd.

"Berg Montana Fittingi" PJSC is specialized in the production of castings for its own needs in the production of fittings, the final output is mainly for export.

"IPO" Ltd. – in Karlovo is producing spare parts for the industry, incl. for the metallurgy enterprises. The company is producing single, small and midsized series of ferrous and non-ferrous metal parts with primary or complete mechanical processing.

"BMB Metal" Ltd. with its capacities in the city of Ichtiman has the potential to produce medium and large-scale castings, incl. with a subsequent mechanical and surface processing to finished products. Using the capacity of "Casting, Forging Mashinery Complex" Ltd in Radomir, the company has the potential to produce large equipment for the mining and metallurgical industry, and other users from the country and abroad.

NSI data about activity NCEA 24.5 "Metal casting" show as follows:

Table 2.10

Indicator	2016	2017	Difference, %
Output produced, BGN million	214	241	113
Value added, BGN million	79	91	115
Total employed in NCEA 24.5 Metal casting	3 698	3 909	106
Average monthly wage (AMW), BGN	827	943	114

The Table shows that the main indicators of metal casting have a clear trend of a **significant growth, above the average level for the sector and for the country.**

The number of employed persons in 2017 compared to the previous year increased by 211, there was a significant increase by 13% in the average wage.

For the same period the increase of the average wage by employees under labor contract in the country by 7.8 %, and the average increase in the metallurgy – by 4 %.

According to the EUROSTAT data, in 2017 the total output produced from the ferrous and the non-ferrous metallurgy in the EU(28) was worth 348.5 milliard, incl. the metal casting with a share of **EUR 39.1 milliard (11.3 %) of the total**, compared to the previous year this was an increase by 7 %.

The reported increase in metal casting in Bulgaria is ca. two times higher than in the EU (13%). Nonetheless, the share of metal casting in the total production of the metallurgical sector remains very low - 2.5% compared to the share of 11% in the EU (28) – see please Figure 14 in Section One.

SECTION THREE

NON-FERROUS METALLURGY IN BULGARIA

3.1. NON-FERROUS METALS - PRODUCTION

The year 2018 was characterized by stable production, sustainable growth and high competitiveness of the non-ferrous metals and their alloys as a result of the ongoing investments in new technologies, in modernization of the capacities, and in energy effectiveness.

3.1.1. PRODUCTION OF COPPER (ANODIC AND ELECTROLYTIC)

The producer of anodic and electrolytic copper in Bulgaria is “Aurubis Bulgaria“ JSC – it is a part of the leading group AURUBIS, Germany. The group is occupying the 1st place in the world producing 1 million tons copper cathodes and different copper products yearly.

“Aurubis Bulgaria“ JSC is processing copper concentrates and copper waste, producing anodic and electrolytic copper, and by-products such as sulfuric acid, anodic sludge, fayalite.

The electrolytic copper of “Aurubis Bulgaria“ JSC is used for the production of copper products and articles, widely used in electrical engineering and electronics, machine building, energy, chemistry, construction, automotive, households.

Two decades after the privatization of the plant, large-scale investments are being made towards production modernization and competitiveness improving, energy efficiency and infrastructure, protecting nature and the working environment. The amount of the investments made is more than EUR 1.1 billion.

In 2018 over EUR 7 million were invested. A project is being implemented for optimization the process of cooling the fayalite in buckets – expected is improving of their flotation and of the working environment as well. At the same time the energy transmission and distribution system of the enterprise is modernized. Renovation of the road infrastructure and the buildings is underway and modernization of the Waste Water Treatment Plant (WWTP) and the construction of new storage of faylite, too.

Table 3.1 and Figure 3.1 show data about the processed concentrates and scrap for the production of anodic and electrolytic copper over a period of five consecutive years (2014 – 2018).

Table 3.1

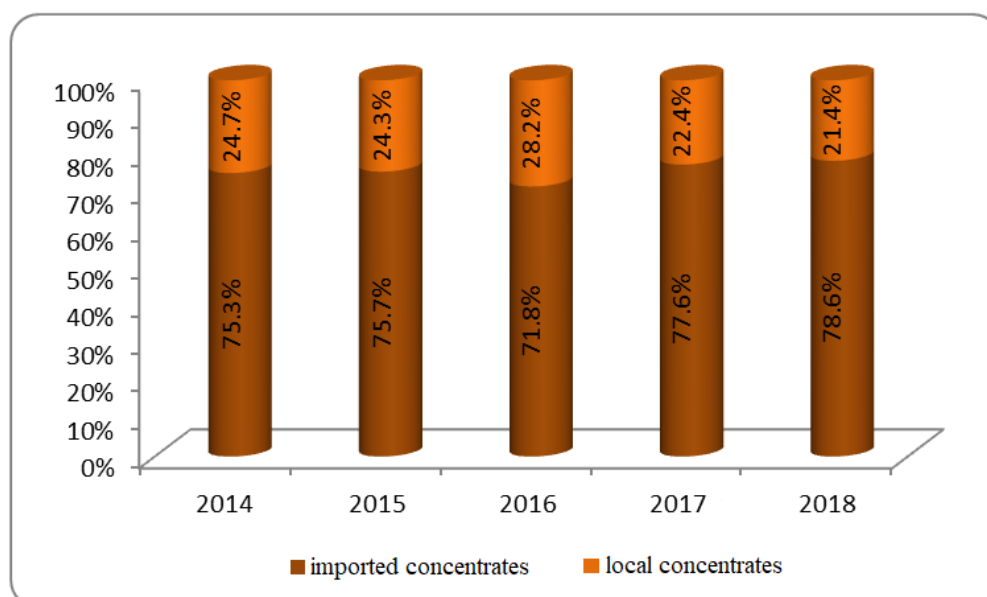
Processed raw materials for the production of anodic and electrolytic copper

Product	2014	2015	2016	2017	2018	Difference 2018/2017	
						+/-	%
Concentrates, tons	1 165 484	1 203 248	1 055 636	1 357 144	1 364 490	7 346	100.5
- copper contents,%	25.20	24.57	23.69	24.00	23.94	-0.06	
- metal contents, tons	293 718	295 690	250 080	325 754	326 661	907	100.3
incl. in imported	221 299	223 942	179 507	252 751	256 820	4 069	101.6
in local	72 419	71 748	70 573	73 003	69 841	-3 162	95.7
Scrap (purchased), tons	62 280	56 168	51 768	52 507	41 844	-10 663	79.7

Source: Company data

In 2018 processed were 1 364 490 tons imported and local copper concentrates - by 7 346 tons more than in 2017. The ratio of metal contents in the local and in the imported raw materials in 2018 is almost 4:1 (Figure 3.1.). The quantity of the processed imported concentrates increased by 1.6% and of the local concentrates decreased by 4.3%, and as a result the relative share of the imported concentrates increased by 1% compared to the previous year.

Figure 3.1



Concentrates processed, tons metal

In 2018 the quantity of the processed copper waste decreased significantly – by 20.3 %. Its relative share in the processed raw materials is 11.4 % (13.9 % in

2017). This is due to the strong competition by the deliveries and the decreased import.

Table 3.2 and Figure 3.2 show data about the production of anodic and electrolytic copper in the period 2014 – 2018.

Table 3.2

Production of anodic and electrolytic copper, tons

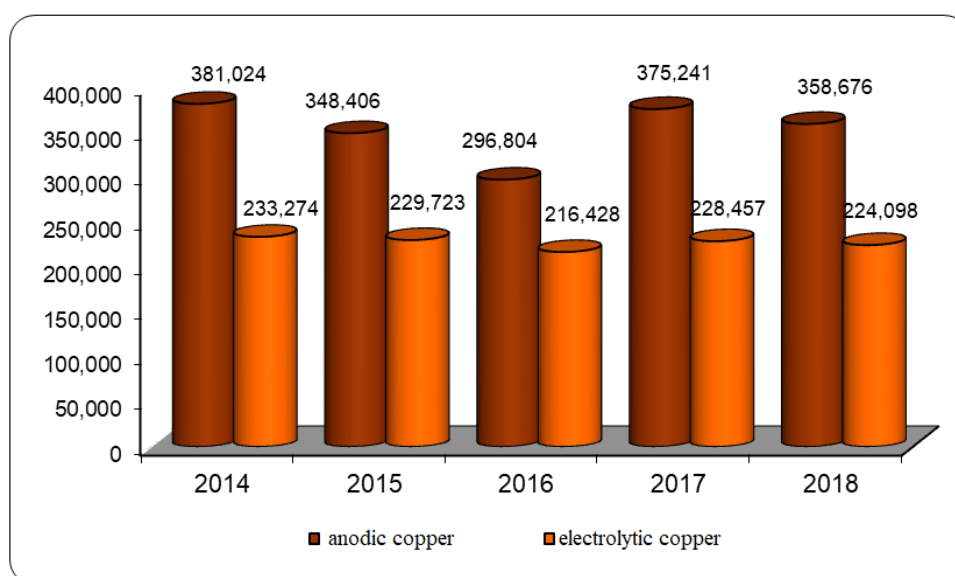
Product	2014	2015	2016	2017	2018	Difference 2018/2017	
						+/-	%
Anodic copper	381 024	348 406	296 804	375 241	358 676	-16 565	95.6
Electrolytic copper	233 274	229 723	216 428	228 457	224 098	- 4 359	98.1

Source: Company data

In 2018 the production of anodic and cathode copper has decreased respectively by 4.4 % and 1.9 % mainly due to the reduced quantity of processed waste.

Using the sulfur contained in the concentrates 1 309 362 tons of sulfuric acid was produced, by 6.1% less than in 2017.

Figure 3.2



Production of anodic and electrolytic copper in 2018, tons

In 2018 refined copper in the world grew by 1.5% and the world production reached 23.9 million tons. Asia, mainly China, recorded the highest growth. There is some growth recorded in the other regions incl. Europe even by smaller volumes. Despite the growth within the EU, the production decreased by 1.4%, respectively by 38 thousand tons, and a decrease was reported in a number of EU member states - Germany, Poland, incl. Bulgaria.

Table 3.3 and Figure 3.3 show the quantities of electrolytic copper produced, by regions in the world.

Table 3.3

World production of electrolytic copper, thousand tons

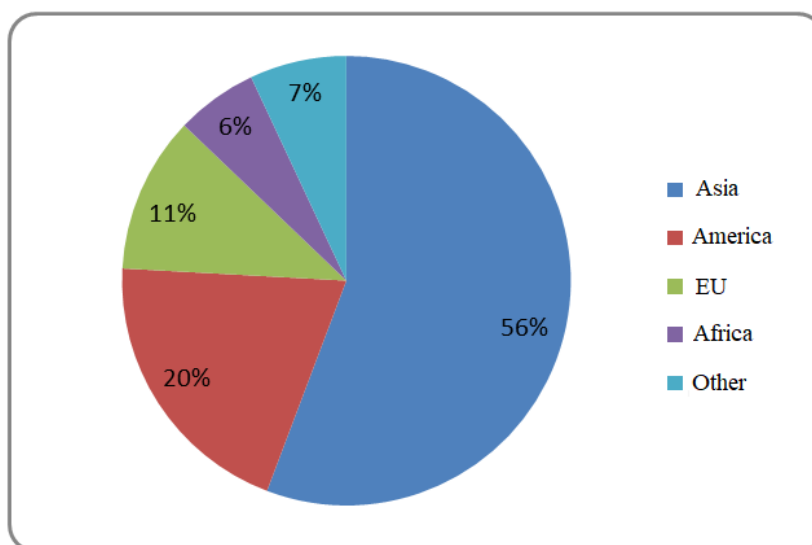
Region	2016	2017	2018	Difference 2018/2017	
				+/-	%
Asia	12 703	13 190	13 314	124	100.9
America	5 214	4 783	4 801	18	100.4
Europe	3 714	3 885	3 950	65	101.7
incl. EU- 28	2 674	2 728	2 690	-38	98.6
Africa	1 257	1 290	1 404	114	108.8
Other	475	376	407	31	108.2
Total	23 363	23 524	23 876	352	101.5

Source: ICSG

Asia is keeping its leading position and has reported the highest relative share from the world production (56 %), but in the same time a relative low growth by 0.9 % (3.7 % in 2017). China has mainly contributed to this growth.

Asia is followed by America with a share of 20% and a growth of 0.4%. **Europe ranks third with a share of 16.5% and an increase by 1.7%. In 2017 the EU has a share of 11% of the refined copper world production, with a share of 12%.**

Figure 3.3



World production of electrolytic copper (by regions), 2018, %

The electrolytic copper produced in Bulgaria in 2018 was 0.94% of the world's output and 8.49% of the EU (28), respectively 0.97% and 8.37% in 2017. The anodic copper represented 1.93% of the world production and 16.75% of the production within the EU.

3.1.2. LEAD PRODUCTION

In Bulgaria there are metallurgical capacities for the production of lead ingots and lead alloys, both on the basis of primary raw materials (concentrates) and lead-containing wastes.

KCM JSC is one of the leading enterprises in the country and the biggest producer of lead, zinc and by-products in the region. Within the company a complete technological process is implemented for the complex processing of primary and secondary raw materials local and imported as well. The company is part of KCM 2000 AD, a holding group acting in the field of extraction and processing of metal raw materials.

In order to meet the global and the European competitiveness standards, the company is implementing large-scale projects and is investing in technological innovation, energy and raw materials efficiency, expanding the raw mix and improving the ecology indicators and the working environment. In 2018, the large investment project "Technological renewal and expansion of production" is being further underway.

New investments made in the last year are coming to BGN 18.9 million. Accents in the investment activity are: gasification of three short-drum furnaces and a combustion furnace in refinery lead production, activated cobalt and nickel cleanser, replacement the burners of refinery boilers, etc.

Data on processed primary and secondary raw materials for lead production are shown in Table 3.4. and Figure 3.4.

Table 3.4

Processed raw materials in the production of lead, tons

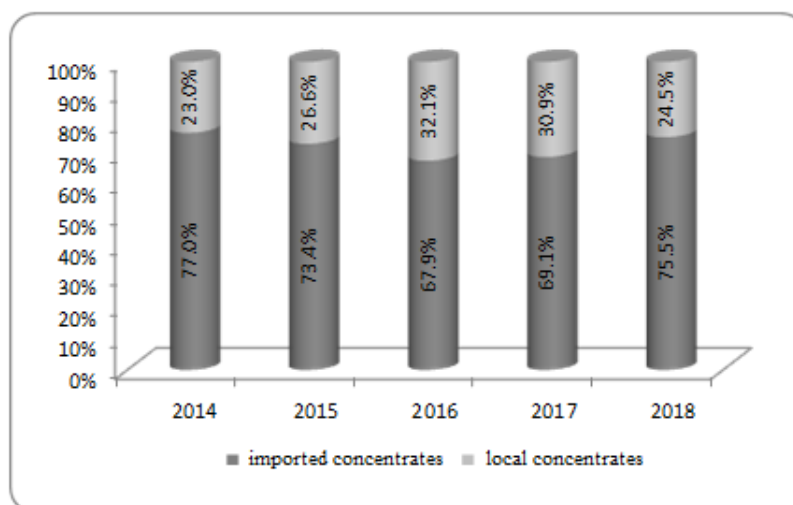
Product	2014	2015	2016	2017	2018	Difference 2018/2017	
						+/-	%
Metal in concentrates	67 190	61 908	61 358	52 149	60 192	8 043	115.4
Incl.: in imported	51 729	45 452	41 670	36 050	45 469	9 419	126.1
in local	15 461	16 456	19 688	16 099	14 723	-1 376	91.5
Processed waste (imported)	11 824	20 604	11 235	15 849	11 809	-4040	74.5

Source: Company data.

In 2018 the processed prime raw materials (concentrates) contained 60 192 tons metal. Lead in the processed imported concentrates grew by 26.1 % but the relative share of the local raw materials decreased. In 2018 their metal content was 31 % and so came to 25 % from the total lead quantity in concentrates (Figure 3.4).

For the production of lead ingots 11 809 tons led waste and semi products were processed - by 25.5 % (4 thousand tons) less than in the previous year.

Figure 3.4



Processed concentrates, tons metal

Secondary lead raw materials, incl. battery waste, occupy a significant share of the metals balance for lead production in the country – for lead ingots and lead alloys as well. In addition to KCM AD, modern facilities for the battery waste processing are in operation in “Monbat Recycling”PJSC and “EL BAT“ JSC.

In 2018 recycled were more than 40 000 tones of secondary raw materials.

A big producer of lead battery alloys in the country is Monbat Recycling. The alloys are used within the companies of the Monbat Group for the production of finished products – lead batteries. The investments in the company in the year 2018 are coming to BGN 11 774 thousand.

“EL BAT“JSC made investments in production facilities expansion and nowadays the company is processing battery waste and is producing commensurate quantities of lead and battery lead alloys.

Table 3.5 and in Figure 3.5 show the data on the total lead production incl. battery alloys in the period 2014-2018.

Table 3.5

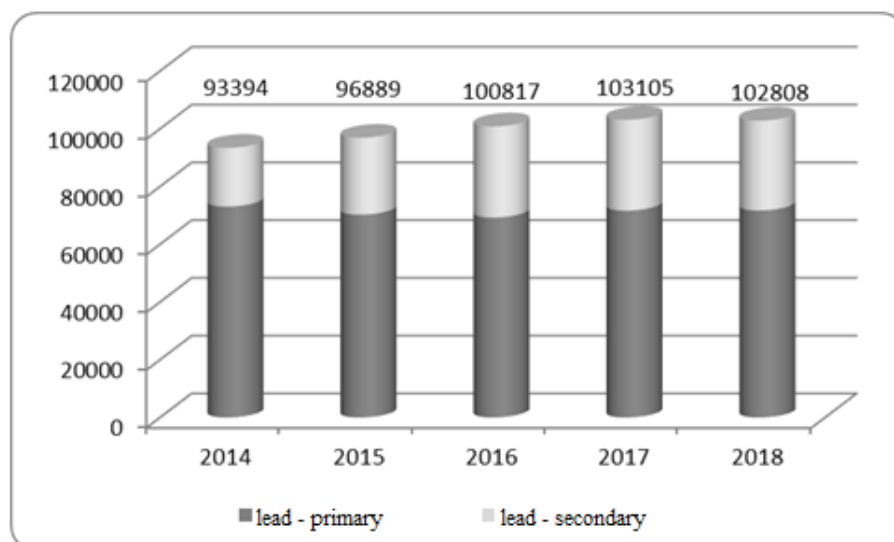
Lead production, in tons

Product	2014	2015	2016	2017	2018	Difference 2018/2017	
						+/-	%
Lead - primary	73 064	70 252	69 256	71 653	71 697	44	100.1
- “KCM”JSC	73 064	70 252	69 256	71 653	71 697	44	100.1
Lead - secondary	20 330	26 637	31 561	31 452	31 111	-341	98.9
“Monbat Recycling”PJSC	15 530	16 231	16 581	16 502	16 211	-291	98.2
“El Bat” JSC	4 800	10 406	14 980	14 950	14 900	-50	99.7
Lead - total	93 394	96 889	100 817	103 105	102 808	-297	99.7

Source: Company data

In 2018 the total quantity of lead produced is 102 808 tons, with a minimal growth by 0.1% in the primary and a decrease by 1.1% in the secondary lead.

Figure 3.5



Lead production in 2018 - total, tons

The world lead production by regions and the largest producer countries for the past three years are presented in Table 3.6 and Figure 3.6.

Table 3.6

World lead production, in thousand tons

Country/Region	2016	2017	2018	Difference 2018/2017	
				+/-	%
Asia	6 901	7 211	7 246	35	100.5
- incl. China	4 665	4 870	4825	-45	99.1
- incl. Republic of Korea	831	800	802	2	100.2
- incl. India	519	570	624	54	10.9
America	2 076	2 092	2 104	12	100.6
- incl. USA	1 123	1 121	1 160	39	103.5
EU(28)	1 757	1 784	1 757	-27	98.5
- incl. Germany	339	354	325	-29	91.8
- incl. UK	307	323	316	-7	97.8
Other	508	479	529	50	110.4
Total	11 242	11 566	11 636	70	100.6

Source: ILZSG

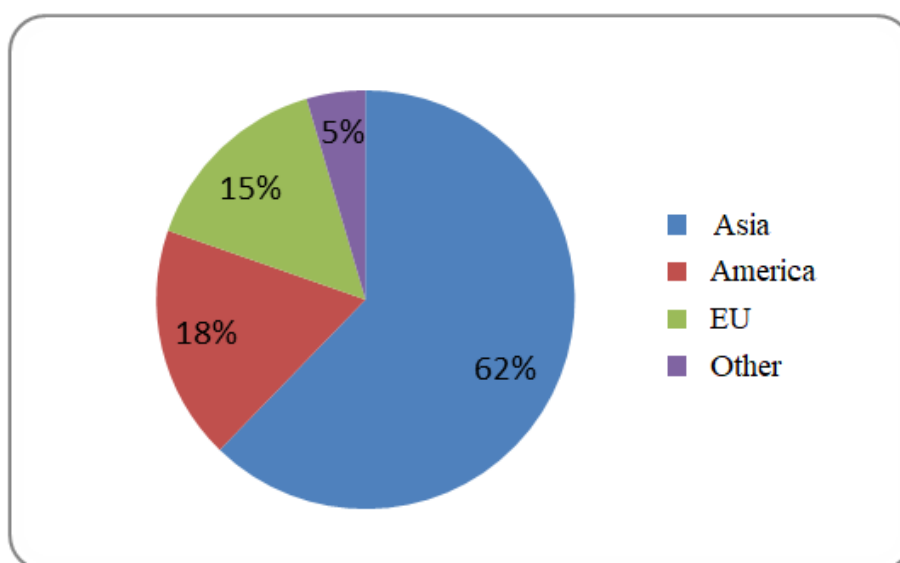
Asia has the biggest relative share of the world production (62 %) with a slight increase by 0.5 %. The decreased production in China – the largest world lead producer was compensate by the increased production in India by 10.9%. **America**

reported a slight increase only by 0.6%. The USA and Mexico reported an increase but the decrease of Canada was over 10%.

With a share of 15% (16% in 2017) the EU(28) is traditionally occupying the third place in the world lead production. Compared to the previous year the production decreased by 1.5% - the most significant decreases are accounted in Germany - by 8.2% and in the UK - by 2.2%.

Germany has the biggest relative share in the EU production (18.5%). The UK is occupying the second place by 18 % and Spain has a share of 10 %.

Figure 3.6



World lead production (by regions), 2018, in %

The total lead quantity produced in 2018 in Bulgaria represents 0.88 % from the world production and **5.85 % from the EU(28) production**, respectively 0.91 % and 5.72 % in 2017.

By volume of total lead produced Bulgaria retained its seventh position among the EU member states.

3.1.3. ZINC PRODUCTION

“KCM”JSC in Plovdiv is the only enterprise for processing of zinc concentrates and various zinc containing semi-products and secondary raw materials to zinc ingots and zinc alloys.

As byproducts of this processing a number of other rare and precious metals and chemical products (sulfuric acid, cadmium, tellurium, bisulfate etc.) are obtained. Data about processed metal contained in local and imported concentrates and the input of secondary raw materials/scrap in the production of zinc are shown in Table 3.7.

Table 3.7

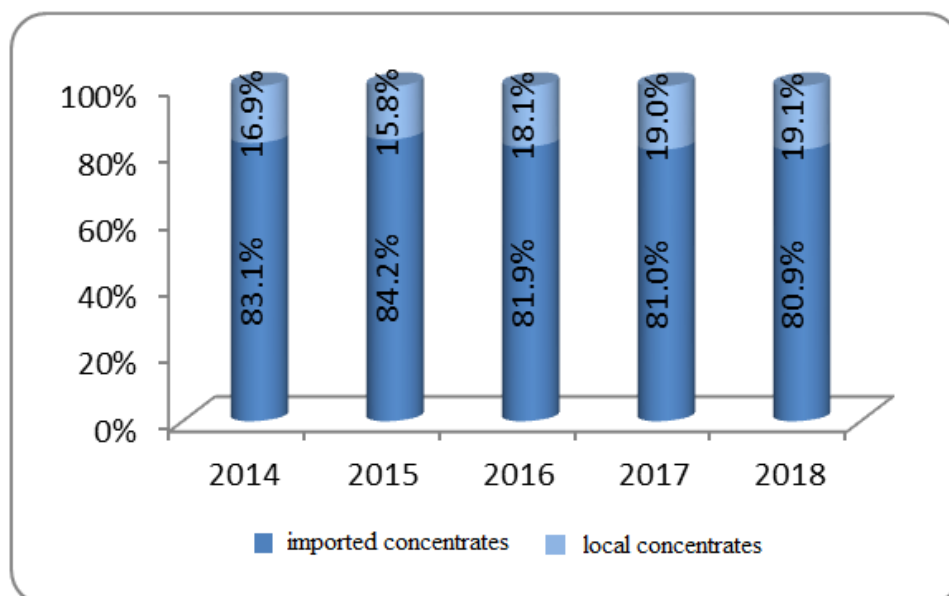
Processed raw materials for the production of zinc, in tons

Product	2014	2015	2016	2017	2018	Difference 2018/2017	
						+/-	%
Metal in concentrates, incl.:	66 685	68 043	63 011	57 307	59 646	2 339	104.1
- import	55 386	57 260	51 596	46 421	48 279	1 858	104.0
- local	11 299	10 783	11 415	10 886	11 367	481	104.4
Processed imported scrap	13 193	11 983	16 802	16 226	18 191	1 965	112.1

Source: Company data

In 2018 the processed concentrates containing 59 646 tons of zinc were by 2 339 tons more (4.1%) compared to the previous year. As a result of the implemented projects for an enlargement of the capacity and efficient processing of secondary raw materials, their quantity increased by 1 965 tons (12.1%) and the share in the total metal balance reached 23.4%. Zinc in local concentrates accounted for 19.1% of the total amount of the concentrates and this ratio (1: 4) is remaining stable in the recent years.

Figure 3.7



Processed concentrates, in tons of metal

Table 3.8 shows data about the zinc produced in the last five years.

Table 3.8

Zinc production, in tons

Product	2014	2015	2016	2017	2018	Difference 2018/2017	
						+/-	%
Zinc - total	76 293	75 095	75 811	73 715	75 150	1 435	102.0

Source: Company data

In 2018 produced were 75 150 tons zinc - by 1 435 tons (2 %) more than in the previous year. The increased quantities are due to the processing of waste and intermediate semi-products.

Table 3.9 and Figure 3.9 show the world zinc production by regions and the biggest producer countries, their relative share and the increase/decrease compared to the previous year.

Table 3.9

World zinc production, in thousand tons

Country/Region	2016	2017	2018	Difference 2018/2017	
				+/-	%
Asia.	9 070	8 651	8 425	-226	97.4
incl. China	6 274	5875	5 730	-145	97.5
incl. India					
EU (28)	1 995	1 996	2 064	68	103.4
incl. Spain	507	510	512	2	100.4
America	1 717	1 632	1 762	130	108.0
incl. Canada	691	598	696	98	116.4
Other	957	989	1023	34	103.4
Total world	13739	13 268	13 274	6	100.1

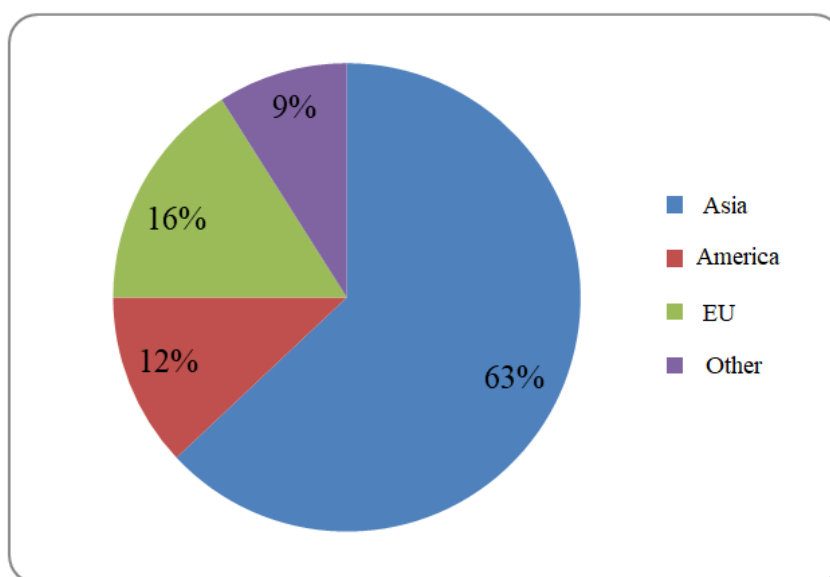
Source: ILZSG

In 2018 zinc production in the world remained at the level of the two previous years. **The Asia's relative share of the world production decreased by 4 % compared to 2017 but the region remained with the biggest share of the world production (63 %).** The total decline in Asia by 2.6% is due to the reduced production in China and in India, by 2.5% and 8.1% respectively.

In the region's ranking EU(28) remains on the second position with a relative share of 16% and with a growth by 3.4%. Spain (24.8%), Finland (14.4%) and Belgium (13.4%) have the biggest shares of the EU production.

America is occupying the third place with a relative share of 12% and a growth by 8% due to the increased production in Canada, Mexico and Peru.

Figure 3.8



World zinc production (by regions), 2018, %

The relative share of zinc produced in Bulgaria represented 0.56% of the world production (0.55% in 2017) and 3.64% of the total EU(28) production, with a slight decrease compared to 2017 (37%) due to the growth in Europe.

3.1.4. PRODUCTION OF PRECIOUS, BYPRODUCT METALS, ALLOYS AND CHEMICAL PRODUCTS

An important part of the technologic processes in the production of the basic non - ferrous metals (copper, zinc, and lead) is the recovery of the useful metallic and nonmetallic components concentrated in the waste technologic gases, in water or in the solid byproducts. Their treatment generates byproduct metals or various commercial chemical products that raise the effectiveness of the main production and at the same time contributing to the protection of the environment.

The volume of the extracted precious and other metals and chemical products depends on their content in the processed primary raw materials (concentrates). The extraction is realized by technological schemes in capacities within the main production.

Data about the production of precious and byproduct metals, alloys and chemical products are presented in Table 3.10.

Table 3.10

Production of precious and byproduct metals, alloys and chemical products (tons, kg)

Product	2014	2015	2016	2017	2018	Difference 2018/2017	
						+/-	%
Cadmium ingots, t	382	344	362	333	313	-20	94.0
Silver, kg	50 200	37 955	52 526	53 053	41 315	-11 738	77.9
Silver products, kg	4 838	2 785	2 445	2 764	2 620	-144	94.8
Gold, kg	278	211	212	249	296	47	118.9
Gold products, kg	32	41	82	54	44	-10	81.5
Tellurium, kg	4 932	4 046	4 479	5 095	3 931	-1 164	77.2
Sodium sulfate, t	1 520	1 372	342	1 747	785	-962	44.9
Sulfuric acid, t	1309063	1340843	1209594	1532099	1 449 979	-82 120	94.6

Source: Company data

In 2018 the quantity of produced gold is growing, reducing are the quantities of produced silver, tellurium, and cadmium. These metals are produced from lead-zinc raw materials.

The metallurgy plants are the only producers of sulfuric acid while processing copper, lead, and zinc primary raw materials. In 2018, 1 450 thousand tons of sulfuric acid were produced - by 82.1 thousand tons less compared to 2017, due to the reduced production of copper concentrates.

3.1.5. PRODUCTION OF ROLLED/PRESSED NON-FERROUS METALS AND ALLOYS

The metal processing industry in Bulgaria is very well developed. From copper, zinc, lead, aluminum and their alloys different articles with a higher value added (sheet, strips, foil, pipes, profiles etc.) are produced.

Data about the production in the period 2014 – 2018 are presented in Table 3.11.

In 2018 the total quantity of R/P non-ferrous metals is growing by 7.4%. The production of copper products and alloys is increasing significantly in 2018 by 12.1%.

The production of R/P aluminum shows a sustainable growth in the last years – in 2018 it reached 94.5 thousand tons – an increase by 3.6%.

The share of the R/P HNFМ production is 46 % of the total, and the share of R/P aluminum and aluminum alloys was 54 % (55.9 % in 2017).

Table 3.11

Production of R/P non-ferrous metals and alloys, tons

Product	2014	2015	2016	2017	2018		Difference 2018/2017	
						%	+/-	%
R/P NFM and alloys	63 940	57 353	57 700	71 853	80 539	46.0	8 686	112.1
incl. copper	42 298	41 329	46 649	57 244	64 197	36.7	6 953	112.2
brass	7 628	8 437	11 051	14 609	16 342	9.3	1 733	111.9
zinc	14 014	7 587	-	-	-	-	-	-
R/P aluminum - Total	83 886	83 184	87 976	91 126	94 424	54.0	3 298	103.6
incl : “Alkomet” JSC	64 790	64 894	65 646	67 096	68 334	39.1	1 238	101.8
“ETEM Bulgaria” JSC	18 023	17 300	21 122	22 820	24 885	14.2	2 065	109.1
“PIH Industry”JSC	1073	990	1 208	1 210	1 205	0.7	-5	99.6
Total:	147 826	140 537	145 676	162 979	174 963	100.0	11 984	107.4

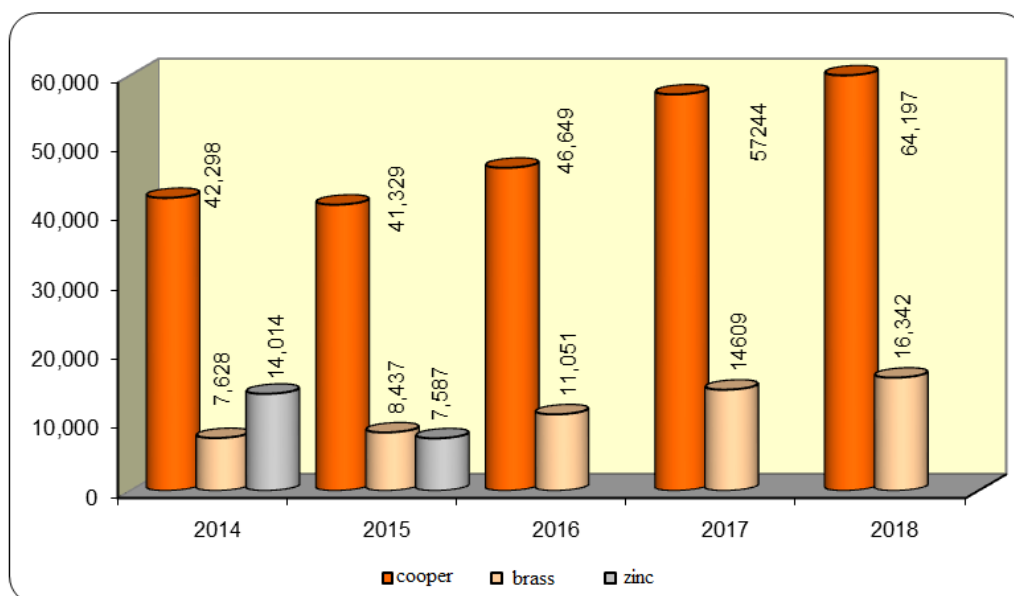
Source: Company data

“Sofia Med” JSC is the main local producer of copper and copper alloys articles. The company is a part of the industrial group “Elval Halcor”, Greece incorporating companies of the “Viohalco” holding, producing rolled and pressed articles of copper, copper alloys, copper cables and aluminum products.

“Sofia Med” JSC is producing a wide range of rolled and pressed articles (sheet, strips, circles, discs, rods, bars, profiles etc.) used in the construction, machine-building, electrical engineering and other sectors of the processing industry. Over the past two years the company's policy has been focused on industrial products for the automotive and for the electrical engineering shrinking the production for the architectural sector.

Figure 3.9 shows the quantities of rolled and pressed HNFM produced in the period 2014 – 2018, by types.

Figure 3.9



Production of R/P HNFMs, tons

In 2018 the total production of R/P copper is increasing by 12.2 %, the rolled increased by 15% and the pressed – by 10.8 %.

The brass products are only rolled – their production is constantly increasing over the last five years and in 2018 reached 16 324 tons showing an increase by 11.9 %. In 2018 the ratio between the produced R/P copper to R/P brass is not changing and remains ca. 4:1 (79.7 %/20.3 %).

The rolled products are 68.4 % from the total production.

For the production of R/P HNFMs electrolytic copper, zinc, and secondary copper raw materials are used. In 2018 processed were 22 186 tons scrap – an increase by 42.6 % compared to 2017.

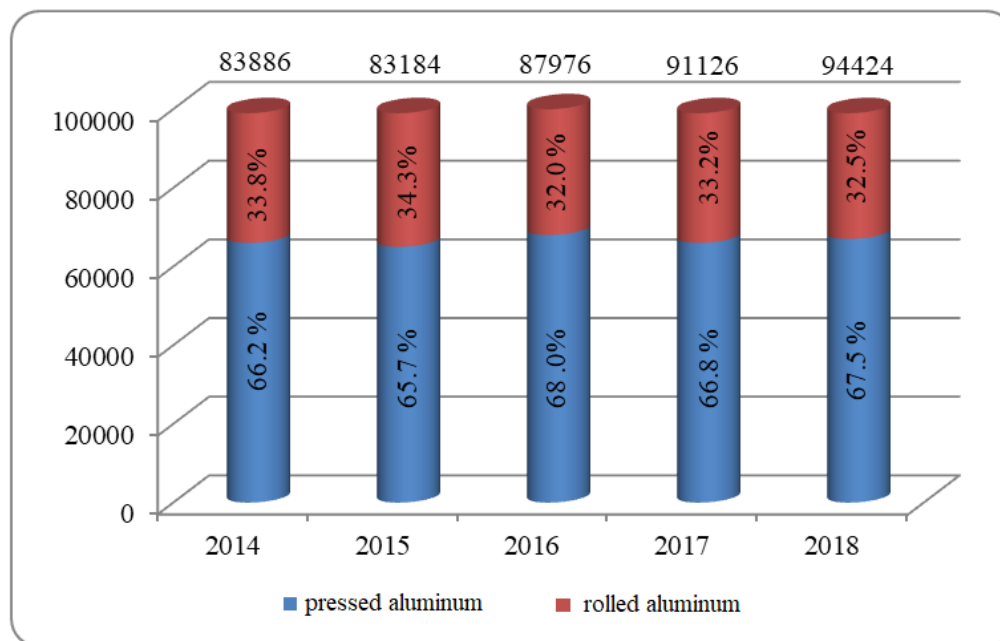
In "Sofia Med" JSC investment projects worth BGN 18.8 million were realized 2018 in:

- modernization and maintenance of the existing equipment aiming higher efficiency and product quality, and upgrading the technology;
- increasing the capacity of brass and special alloys casting by a new electric furnace for melting and casting of brass;
- a new tinning hot line for copper and copper alloys;
- production of new industrial products for the automotive and the electrical engineering.

The main producers of R/P aluminum are “Alcomet” JSC – Shumen and “Etem Bulgaria” JSC – Sofia; aluminum welded pipes are produced by “PIH Industry” – Rousse.

Figures illustrating the production of aluminum R/P by enterprises are presented in Table 3.11, and Figure 3.11 shows the total production and production by types.

Figure 3.10



Production of aluminum R/P, tons

“Alcomet” JSC is the biggest company specialized in the production of pressed and rolled aluminum - strips, sheet, foil, profiles, finstock.

In 2018 the company reported production of 68 334 tons R/P products – by 1 238 tons more compared to 2017. Alcomet’s production takes a share of **72.4 % of the total amount of R/P aluminum** produced in the country.

The production of rolled products shows a higher share compared to the pressed products - 66.8 % /33.2 % in 2018 and 67.5 %/32.5 % in 2017.

The company has invested in new technologies and modernization of existing capacities over the past 20 consecutive years, enlarging its portfolio and entering new markets and sectors such as construction and architecture, automotive and packaging production.

In 2018 “Alcomet” made investments coming to BNG 58.2 million. A three-year investment program worth BGN 69 million is under implementation which includes high-tech 2500-tons Press SMS HybrEx, new generation cold rolling device and a continuous casting line. All these will contribute to an increase of the annual production up to 100 thousand tons and to an expand of the company portfolio with prioritizing the production for the automotive industry.

In the past year 7 581 tons aluminum waste was processed in the company (by 15.9 % more than in 2017).

"Etem Bulgaria" JSC is producing different types of aluminum profiles and architectural constructions, mainly door and window frames and facade elements

for buildings. For several years the company is a certified producer of automotive products for the world biggest automotive companies.

In 2018 the share of "ETEM Bulgaria" JSC is 26.4% of the total amount of aluminum R/P (respectively 25% in 2017). Compared to the previous year the production increased by 9.1%.

The constant and sustainable development of the company is due to the annual investments made for the modernization and expansion of production capacities, which resulted in a growth of the capacity and of the assortment. **In 2018 the investments made are coming to BGN 9.8 million.** Invested was in equipment for additional processing of profiles for the automotive sector, in improving the ERP system for management, automation and accelerated processing of business processes and decision making

“PIH Industry” JSC is the only company in the country producing **welded aluminum pipes** - 1 205 tons were produced in the previous year.

3.1.6. UTILIZATION OF NON-FERROUS METAL WASTE

Metals have practically an endless life cycle, which allows the scrap to be used as a raw material in metallurgical production preserving resources and nature. Its processing to final products leads to improved economic and environmental performance of enterprises and reduction of energy consumption.

Data on the processed waste from non-ferrous metals (metal content) for the period 2014 – 2018 by the companies BAMI- members are presented in Table 3.12.

Table 3.12

Processed non-ferrous metal waste, tons

Waste	Total					Difference 2018/2017	
	2014	2015	2016	2017	2018	+/-	%
	Copper	78 576	75 903	62 942	68 066	64 030	-4 036
Lead	34 317	46 754	44 230	48 745	40 718	8 027	83.5
Zinc	13 193	11 983	16 802	16 226	18 191	1 965	112.1
Aluminum	15 717	18 277	14 615	11 793	20 581	8 788	174.5
Total metals	141 803	152 917	138 589	144 830	143 520	-1 310	99.1

Source: Company data

The Table shows that in 2018 the total quantity processed scrap is slightly decreasing compared to the previous year – by 1 310 tons (0.9%). The quantities processed copper and lead waste is decreasing but the processed zinc and aluminum waste is increasing. The processed copper waste is by more than 10 000 tons less, in the same time the processed R/P copper and brass is increasing

by 47%. Due to the expanding of the production facilities and technology improvement the quantity of processed zinc waste is continuously growing with an increase by 12.1%. The lead and lead alloys waste processed in all three companies is decreasing by 8 027 tons; imported pure lead waste is increasing but the imported battery waste is decreasing by 25%.

The collection and utilization of aluminum waste is growing with every year. In 2018 the production and the export of aluminum ingots are almost doubled compared to the previous year and so the quantities aluminum waste also increased.

3.2. TRADE EXCHANGE AND CONSUMPTION OF NON-FERROUS METALS

The non-ferrous metals and products of them are subject of the stock exchange and are traded at prices of the international markets, generally of the London metal exchange (LME).

The Figures below show the dynamics of the prices of the basic metal ingots, which Bulgaria has produced in the period January 2018 - December 2018, taken from the official publications of the LME.

Figure 3.11
Prices of electrolytic copper (USD/ton)

The 2018 average copper price at the LME compared to 2017 shows an increase by 5.8%. In the first half of the year the prices were from 7 100 to 6 750 USD per ton, in the mid of the year a decline was registered by more than 18 %; the decrease over the year was by 1 200 USD/ton.

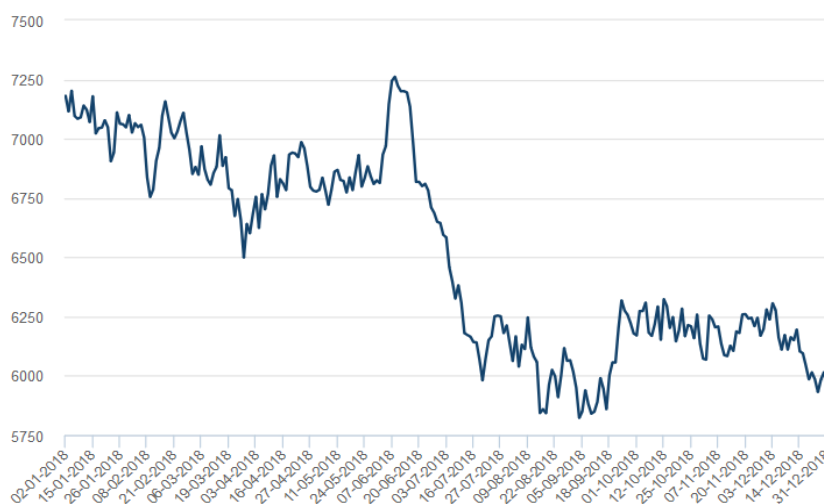


Figure 3.12
Prices of Pd (USD/ton)

In 2018 the lead average price at the LME decreased by 3.1% compared to 2017, up to the end of the second quarter it was between 2 600 and 2400 USD/ton. After a decline in the middle of the period prices remain at the level of 2000 USD/ton up to the end of the year. The difference between the maximum and the minimum average monthly prices of lead were ca. 650 USD/ton – a change by 25 %.

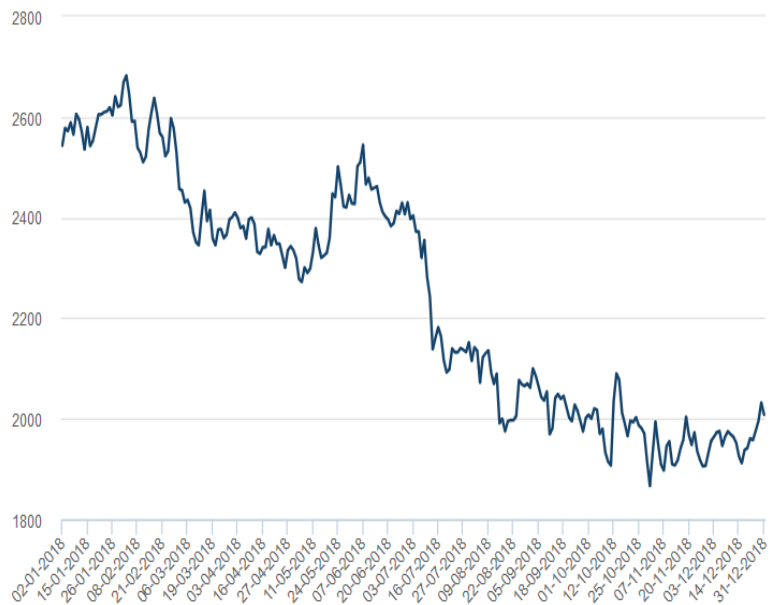
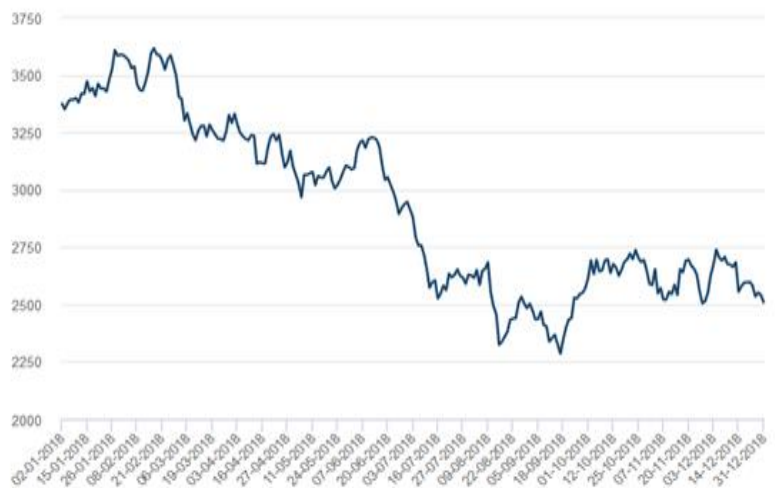


Figure 3.13
Prices of zinc (USD/ ton)

In 2018 the average price of refined zinc at the LME is increasing by 1%. In the first half of the year prices were between 3 000 and 3 500 USD/ton. Then a decline was registered and by the end of the year prices were stable at the level of 2 600 USD/ton. The difference between the maximum and the minimum average monthly prices of refined zinc were ca. 1 100 USD/ton – a change by 30 %.



The data above show that in 2018 there was a significant dynamic in the basic metal prices at the LME with a downward trend. These had an impact on the production of metals and on indices of enterprises when trading at international exchange prices.

3.2.1. IMPORT OF NON-FERROUS METALS AND FINISHED PRODUCTS

The quantities of imported non-ferrous metals, alloys and finished products, and metal waste (scrap) during the last five years are shown in Table 3.13.

Table 3.13

Import of basic non-ferrous metals and finished products, tons

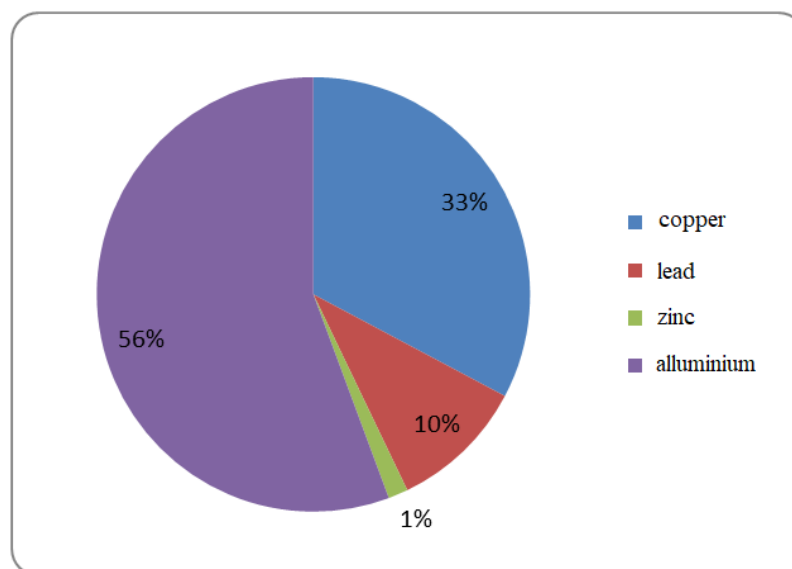
Items	2014	2015	2016	2017	2018	Difference 2018/2017	
						+/-	%
Copper, total, incl.	86 161	85 908	93 052	108 990	104 995	-3 995	96.3
Anodes	924	211	127	1	6	5	600.0
Cathodes, alloys, blanks	13 812	12 211	20 498	38 994	36 010	-2 984	92.3
Scrap	60 453	59 728	49 543	55 299	53 031	-2 268	95.9
Bars and profiles	5 006	5 411	5 632	5 682	6 116	434	107.6
Wire	2 782	4 783	13 613	5 332	6 156	824	115.5
Sheet and foil	1 416	1 594	1 292	1 334	1 507	173	113.0
Pipes	1 768	1 970	2 347	2 348	2 169	-179	92.4
Lead, total, incl.	29 262	25 181	35 463	31 059	32 443	1 384	104.5
Ingot and alloys	12 439	8 394	16 482	16 203	14 584	-1 619	90.0
Scrap (pure)	16 660	16 484	17 827	14 461	16 050	1 589	111.0
R/P metal	163	303	1 154	395	1 809	1 414	458.0
Zinc, total, incl.	9 660	6 491	3 896	1 398	4 736	3 338	338.8
Ingot and alloys	8 746	5 322	3 243	656	4 528	3 872	690.2
Scrap	504	610	148	50	4	-46	8.0
R/P metal	410	559	505	692	204	-488	29.5
Aluminum, total, incl.	135 148	150 548	158 162	171 041	178 482	7 441	104.4
Ingot and alloys	94 982	108 968	116 066	123 757	133 286	9 529	107.7
Scrap	1 607	2 917	1 533	2 261	1 622	-639	71.7
Bars and profiles	16 770	17 648	19 458	22 022	18 820	-3 202	85.5
Wire	3 190	3 562	4 309	4 235	4 127	-108	97.4
Sheets and strips	11 992	10 696	9 837	10 821	13 674	2 853	126.4
Foil	5 453	5 040	4 863	5 586	5 127	-459	91.8
Pipes	1 154	1 717	2 096	2 359	1 826	-533	77.4
Total, tons	260 231	268 128	290 573	312 488	320 656	8 168	102.6
Value, EUR million	742.0	792.0	739.6	1 008.2	1 033.7	25.5	102.5
Value, BGN million	1 451.3	1 549.0	1 446.5	1 971.9	2 021.7	49.8	102.5

Source: Customs statistics, NRA

In 2018 imported were 320 656 tons non-ferrous metals and products of them worth BGN 2 021.7 million - compared to 2017 the import grew in natural indicators and in value by 2.6% and 2.5% respectively.

The structure of the import of non-ferrous metals and their products by items is presented on Fig. 3.14.

Figure 3.14



Structure of the import of NF metals and their products (total ingots, R/P metal and scrap) by items

The import of aluminum and aluminum products shows traditionally the highest relative share (56%) of the total import of non-ferrous metals and products and in 2018 marks an increase by 4.4%. The import of **aluminum ingots** has a share of 74.7 % of the product group (73 % in 2017) and 41.6 % of the total import.

None processed aluminum and aluminum alloys are imported from: the EU – 32.9 % incl. from Greece - 21.2% of the total import; from Russia - 31 % and from India – ca. 17 %.

The import of **aluminum products** is increasing by 3.2 %. Ca. 55% of the imports are from the EU, 22.2 % - from Turkey and the import from China is raising to 16.1%.

With 33% the group **copper and copper products** occupy the second place within the import of non-ferrous metals and products of them. The share of the imported **copper waste** was 50.2% of this group and 16.5% of the total import of non-ferrous metals (17.7 % in 2017). The import from the Balkan countries was ca. 53% of the total and the import from Lebanon – 24.6%.

Refined copper and copper alloys are imported mainly from Serbia (44.2 %), Russia (40.1 %), and only 3.2 % from the EU member states. In comparison to 2017, in 2018 the import decreased by 7.7 %.

The import of **unprocessed lead (ingots) and lead products** is 45 %, in 2018 there was a decrease by 10 %. The largest quantities were imported from Serbia – 44.9 %, from Republic of Korea - 32 %, and from the EU – ca. 7 %.

The imported **lead metal waste (scrap)** accounted for a share of 49.5 % of this group and ca. 5 % of the total non-ferrous metals and products import. 65.3 % of the import was delivered from Romania and ca. 13% - from Greece and Netherland. The import of lead waste increased by 11% compared to the previous year.

In 2018 the import of **unprocessed zinc** increased ca. 7 times - 3 900 tons more than in the previous year when only 656 tons were imported. Almost all imports are coming from the EU member states and 84% of the total import came from Spain.

3.2.2. EXPORT OF NON-FERROUS METALS AND FINISHED PRODUCTS

Data on the export of non-ferrous metals, finished products and metal waste (scrap) by types for the period 2014 – 2018 are presented in Table 3.14.

The total volume of the export in 2018 was 693 417 tons, worth BGN 6 174.2 million. Compared to the previous year in natural terms **it grew by 11 133 tons (1.6 %) and in value – by BGN 135.1million (2.2 %)**.

The structure of the export shows that Bulgaria, besides being a producer and netto exporter of metal ingots (copper, zinc and lead) exports also considerable quantities of finished products (profiles, sheet, strips, foil etc.) with a high value added. Due to the small local needs and to the modern processing capacities a large part of these products is primarily export-oriented.

In 2018 the export of **electrolytic copper** decreased by c 2.2 %. Exports directed to China increased by more than 11 % (reaching 51.7 % of the total volume), to Turkey 28 %, and to Italy - 14.8 %.

Traditionally exports of R/P **copper and brass (sheet, strips, bars etc.)** go mainly to the EU member states (82.1 %) – compared to exports in 2017 there was an increase by 28.6 %.

The export of **lead ingots** decreased by 2.9 % compared to 2017, the exported quantities to Turkey were 61.9 % of the total and 33.5 % were exported to the EU member states.

Table 3.14

Export of non-ferrous metals, products and scrap, tons

Items	2014	2015	2016	2017	2018	Difference 2018/2017	
						+/-	%
Copper, total, incl.	371 935	385 745	320 834	410 221	411 751	1 530	100.4
Anodic copper	116 252	118 755	75 585	146 617	135 072	-11 545	92.1
Electrolytic copper	196 880	209 554	185 485	195 425	191 192	-4 233	97.8
Scrap	8 488	7 176	7 176	8 826	9 130	304	103.4
Bars and profiles	18 800	19 888	19 582	21 945	29 704	7 759	135.4
Wire	1 169	635	6 107	324	766	442	236.4
Sheet, strips and foil	30 297	28 996	26 758	36 872	45 779	8 907	124.2
Pipes	49	741	141	212	108	-104	50.9
Lead, total, incl.	83 152	81 045	77 791	81 782	79 243	-2 539	96.9
Ingots	83 056	80 865	77 527	77 577	75 315	-2 262	97.1
R/P metal	79	82	85	98	110	12	112.2
Scrap (pure)	17	98	179	4 107	3 818	-289	93.0
Zinc, total, incl.	76 609	72 535	74 044	66 398	66 951	553	100.8
Ingots	60 879	62 920	73 202	65 048	66 340	1 292	102.0
R/P metal	14 347	8 267	176	687	109	-578	15.9
Scrap	1 383	1 348	666	663	502	-161	75.7
Aluminum, total, incl.	112 150	111 496	114 091	123 883	135 472	11 589	109.4
Ingot	7 874	7 073	4 422	5 840	11 620	5 780	199.0
Scrap	23 584	22 351	24 153	27 638	30 837	3 199	111.6
Bars and profiles	28 720	30 358	31 686	34 901	38 580	3 679	110.5
Wire	386	258	154	108	270	162	250.0
Strips and sheet	17 288	14 785	13 737	16 060	13 659	-2 401	85.0
Foil	23 993	26 512	29 765	29 238	30 830	1 592	105.4
Pipes	10 305	10 159	10 174	10 098	9 676	-422	95.8
Total	643 846	650 821	586 760	682 284	693 417	11 133	101.6
Value, EUR million	2 562.8	2 628.9	2 050.3	3 087.7	3 156.8	69.1	102.2
Value, BGN million	5 012.4	5141.7	4 010.1	6 039.1	6 174.2	135.1	102.2

Source: Customs statistical, NRA

In 2018 the export of **zinc** (ingots) increased by 2%. Exports were directed mainly to the EU market - 48.1 % and the rest was delivered to Turkey and Serbia.

The exported R/P aluminum accounted 68.7 % of the total export in the aluminum group. The waste had a share of 22.8 % and ca. 8.5 % was the share of the exported **secondary aluminum ingots and alloys** derived from the processing of waste. In 2018 the exported quantities increased by 99 %.

In 2018 the export of only R/P aluminum increased by 2.9 %. There was a significant increase of the exported rods, profiles (by 10.5%), and foil (by 5.4 %). More than 92 % of the sales were directed to markets in the EU member states.

Despite the existing secondary metal processing capacities in the country, the **exported copper, lead, zinc, and aluminum waste occupied 6.4% of the total non-ferrous metal and products export**. Aluminum waste and scrap have the biggest share of the export. Compared to 2017 the realized export of non-ferrous metal scrap was as follows: aluminum and copper grew by 11.6% and 3.4 % respectively, lead and zinc decreased by 7 % and 24.3 % respectively.

Aluminum waste (over 82 %) was realized in the EU member states. The biggest share of copper scrap exported was to China, followed by the EU (41.6 %) and Turkey (17 %). Almost 100 % of the lead waste was exported to Romania where there are Bulgarian facilities for its processing.

Tables 3.13 and 3.14 allow the following conclusions to be drawn about the trade exchange in 2018:

- **The total export of non-ferrous metals and finished products exceeded the corresponding import in terms of quantity more than 2 times** and compared to 2017 grew by 1.6 %. This growth was due to the increased R/P metal export (ca. 20 000 tons);
- **The value of the export in 2018 reached BGN 6 174.2 million and was by BGN 135.1 million more** compared to 2017;
- **The non-ferrous metals and finished products import grew in terms of quantity and in value - by 2.5 %**, due to the increased aluminum ingots and semi-products deliveries needed for the expanded production of R/P aluminum.

The non-ferrous metallurgy in Bulgaria remains export-oriented keeping the trend of increased export of non-ferrous metals and finished products with higher value added.

3.2.3. FOREIGN TRADE TURNOVER OF NON-FERROUS METALS

Summarized data about the import and the export in the non-ferrous metallurgy in terms of quantity and in value are presented in Table 3.15 и Table 3.16.

Table 3.15

Foreign trade turnover of non-ferrous metals, tons

Indices	2014	2015	2016	2017	2018		Difference 2018/2017	
						%	+/-	%
Import	260 231	268 128	290 573	312 488	320 656	31.6	8 168	102.6
Export	643 846	650 821	586 760	682 284	693 417	68.4	11 133	101.6
Turnover total	904 077	918 949	877 333	994 772	1 014 073	100.0	19 301	101.9
Balance	383 615	382 693	296 187	369 796	372 761	-	2 965	100.8

Source: Customs statistics, NRA

Data in Table 3.15 show that in 2018 the export of non-ferrous metals in terms of quantity exceeded the import 2 times and the foreign trade turnover increased by 1.9% (19 301 tons). This was due to the increased export of processed metals – R/P copper and aluminum and on the second place – to the higher quantities of exported copper. In the same time the import of some metal raw metals is increasing - zinc and aluminum ingots.

As an end result the positive trade balance is increasing by 3 000 tons.

In terms of value in the previous year the foreign trade turnover is also increasing – by BGN 184.9 million (2.3 %) and **the positive balance reached BGN 4 152.5 million (Table 3.16).**

This is the highest result in the mentioned five-year period and is significantly contributing to reduce the negative total foreign trade balance of Bulgaria.

Table 3.16

Foreign trade turnover of non-ferrous metals, BNG million

Indices	2014	2015	2016	2017	2018		Difference 2018/2017	
						%	+/-	%
Import	1 451.3	1 549.0	1 446.5	1 971.9	2 021.7	24.7	49.8	102.5
Export	5 012.4	5 141.7	4 010.1	6039.1	6 174.2	75.3	135.1	102.2
Turnover total	6 463.7	6 690.7	5 456.6	8 011	8 195.9	100.0	184.9	102.3
Balance	3 561.1	3 592.7	2 563.6	4 067.2	4 152.5		85.3	102.1

Source: Customs statistics, NRA

3.2.4. SALES OF NON-FERROUS METALS AND R/P METALS

Table 3.17 presents a company information on the sales of Bulgarian production of non-ferrous metals and finished products of them in the period 2014 – 2018.

Table 3.17

Sales of non-ferrous metals and R/P metal, tons

Items	Sales	2014	2015	2016	2017	2018
Anodic copper	Home market	-	-	-	-	-
	Export	116 209	118 573	70 793	146 617	129 865
	Total	116 209	118 573	70 793	146 617	129 865
Electrolytic copper	Home market	35 166	28 006	29 033	21 315	32 378
	Export	191 383	208 150	185 006	207 252	191 321
	Total	226 549	236 156	214 039	228 567	223 699
Lead and alloys	Home market	20 611	21 473	27 838	26 293	27 787
	Export	72 355	75 714	72 411	75 157	74 018
	Total	92 966	97 187	100 249	101 450	101 805
Zinc and alloys	Home market	17 681	12 692	6 690	6 717	6 569
	Export	55 952	57 618	70 615	63 734	66 766
	Total	73 633	70 410	77 305	70 451	73 335
R/P HNFM	Home market	1 450	1 563	1 619	1 403	1 175
	Export	62 999	55 890	56 174	70 145	78 668
	Total	64 449	57 453	57 793	71 548	79 843
Aluminum R/P	Home market	7 537	8 616	8 054	7 145	7 112
	Export	76 437	73 931	78 553	82 045	83 626
	Total	83 974	82 547	86 607	89 190	90 738

Source: Company data

Electrolytic copper - 85.5 % of the sales were realized on international markets and 14.5 % remained for home consumption. Deliveries for the home market increased by 11 063 tons and respectively the import of cathode copper decreased.

Lead and lead alloys - 72.7 % of the production was exported and 27.3 % was sold on the home market. Compared to 2017 there is a decrease in the export; local sales increased by 2%.

Zinc ingots – the export marked an increase by ca. 3 thousand tons coming to 91 % of the production and 9 % were sold on the home market.

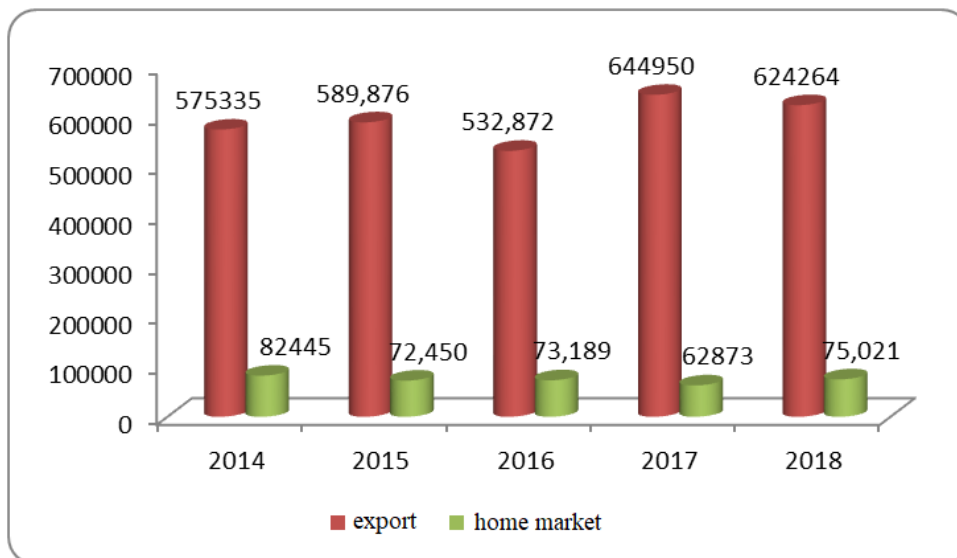
R/P HNFM – in 2018 only 1.5 % of the production was realized on the home market. The production was mainly for export – it increased by 11.6% and represented 98.5 % of the total volume.

R/P aluminum – the sales on the home market remained unchanged over the last two years; the increase of the export is due to the increased production. The ratio

between realization on the home market to realization on foreign markets remains 7.8% / 92.2 %.

The structure of basic and R/P non-ferrous metals total sales in the last five years is presented on Figure 3.15.

Figure 3.15



In 2018 the total sales on the home market increased up to 10.7% from the realized quantities (8.9 % in 2017) and the rest of 89.3% were exported (91.1 % in 2017).

Figure 3.16 shows that the non-ferrous metallurgy in Bulgaria is an export-oriented sector as the export is exceeding the sales on the home market by many times.

3.2.5. CONSUMPTION OF NON-FERROUS METALS AND ALLOYS

The real home consumption (RHC) is defined as the sum of the realization on the home market (according to data provided by the Bulgarian producers) and the import reported by the Customs Agency and the NRA. Data about the RHC in the period 2014 - 2018 is presented in Table 3.18 and Figure 3.17.

In 2018, 55.1% of the domestic consumption of the basic non-ferrous metals (copper, lead and zinc) was covered by the local production (49.4 % in 2017) and the share of the imported metals was 44.9 %.

Table 3.18

Real home consumption (RHC) of non-ferrous metals and rolled/pressed NFM, tons

Items	Origin	2014	2015	2016	2017	2018	
							%
Electrolytic copper	Local production	35 166	28006	29 003	21 315	32 378	47.3
	Import	13 812	12211	20 498	38 994	36 010	52.7
	Consumption	48 978	40217	49 501	60 309	68 388	100.0
Lead	Local production	20 611	21473	27 793	26 293	27 787	65.6
	Import	12 439	8394	16 482	16 203	14 584	34.4
	Consumption	33 050	29867	44 275	42 496	42 371	100.0
Zinc	Local production	17 681	12692	6 690	6 717	6 569	62.9
	Import	8 746	5322	3 243	656	3 872	37.1
	Consumption	26 427	18 014	9 933	7 373	10 441	100.0
R/P HNFM	Local production	1 450	1563	1 619	1 403	1 175	6.5
	Import	11 545	14 620	24 543	15 783	17 961	93.5
	Consumption	12 995	16 183	26 162	17 186	19 136	100.0
Aluminum R/P	Local production	7 537	8616	8 054	7 145	7112	14.1
	Import	38 559	38663	40 563	45 023	43 574	85.9
	Consumption	46 096	47 279	48 617	52 168	50 686	100.0

Source: Customs statistics and NRA (import), and Company data (home sales)

The RHC of electrolytic copper grew by 13.4 % due to the significant growth in the production of copper products and copper alloys.

The RHC of lead remained at last years level. The RHC of zinc shows an increase by over 40% covered by import.

In 2018, the RHC of R/P HNFM increased by 11.3 %. The share of the local production was only 6.5% and 93.5% of the demand was covered by import.

The RHC of R/P aluminum is covered mainly by imports. In 2018 the country demand decreased by 4.7%. Sales from the domestic producers remained at the same level as in the previous year but the import decreased by 1 500 tons.

The Apparent Consumption (AC) is another indicator defined as the sum of the production and the import, reduced by the export. Data about the AC of basic and R/P non-ferrous metals in 2018 are presented in Table 3.19.

Apparent consumption of non-ferrous metals and R/P products in 2018, tons

Items	P	I	E	AC
Electrolytic copper	224 098	36 010	191 192	68 916
Lead, incl/ alloys	102 808	14 584	75 315	42 077
Zinc, incl. alloys	75 150	4 528	66 340	13 338
R/P of NFM	80 539	17 961	76 576	21 924
Aluminum R/P	94 424	43 574	93 015	44 983

*Source: Customs statistics (for the export and import) and
Company data (for the production)*

Data about RHC and AC show that the demand of the Bulgarian industry and of the home market are significantly under the capacity of the working facilities and the volume of the produced non-ferrous metals and products of them. And these define the significant export potential of the Bulgarian non-ferrous metallurgy.

The sector's sustainable development and competitiveness on international markets are based on the investments and the appropriate restructuring made over the years. The sector is a net exporter and is contributing to the Bulgarian export.

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