BULGARIAN ASSOCIATION OF THE METALLURGICAL INDUSTRY

METALLURGY IN BULGARIA

2017

SOFIA, 2018

For the third decade, the annual edition of the Bulgarian Association of Metallurgical Industry (BAMI) is informing its members and partners about the state and achievements of the sector, the trade exchange and the consumption of metals and metallurgical products.

The publication is intended for managers and experts of metallurgical enterprises BAMI members, but could be also used by a wide range of external experts.

The BAMI team working on the issue of „Metallurgy in Bulgaria 2017" thanks to all business executives for the information provided on their production/realization and investments made during the year and the Ministry of Economy for the assistance in the preparation of the import/export analysis.

The publication is thematic and includes only economic, statistical and production information. It does not highlight the activities of the Management Board and BAMI and the directions on which they worked during the period. Those topics are subject of other materials and reports published on the Association's official website.

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
NAFTA	-	North American Free Trade Agreement
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,

To your attention is presented the annual edition of the BAMI „Metallurgy in Bulgaria 2017“. Here you will find data on the production of ferrous and non-ferrous metals, finished products and byproducts, their markets and their share in the Bulgarian industry, in the metallurgy of Europe and of the world.

With this edition BAMI is informing its members, the Bulgarian metallurgical community, its European partners and the interested authorities about the state and the development of the metallurgical industry, the new investments in modern capacities and technologies in order this industry to remain competitive and environmentally friendly, and improving further the working environment.

Nowadays the metallurgical industry is a major sector of the Bulgarian economy, realizing its production mainly on European and world markets. Therefore our strategic goal is to work more efficiently, to preserve and expand our markets, to establish new productions with high value added. The indicators for 2017show that we are successfully moving on this path of sustainable development.

During the year we achieved a lot, but it is only a part of plans and development projects to be implemented in the years coming. Today's successes give us hope and confidence for a successful future.

Finally, I would like to thank all who contributed to the present edition with collected and processed information that is important and useful not only for the managers and experts in metallurgy but also for many institutions and partners in the country and abroad.

Yours faithfully,

ANTON PETROV
Chairman of the Board

SECTION ONE

ECONOMY IN 2017
(SHORT REVIEW – BULGARIA, EU)

The socio-economic and political environment in Bulgaria, the region, Europe and the world in 2017 continues to have the characteristics of the last years - relatively successful for the economy and with sustainable growth but politically and socially unstable. The migration flows from military and conflict areas in the Middle East and Africa continued, imposed were new sanctions against Russia, there are contradictions among the NATO partners, there were autonomous policies of some member states despite of EU decisions.

In this complex political and socio-economic environment the Bulgarian industry is looking for opportunities to preserve productions, to increase its competitiveness and sustainable development. Additional internal factors have also their impact - such as demographic policy, education and health, energy, labor market etc.

As a result of all these the Bulgarian economy is reporting a GDP growth of 3-4% over the years, but this is not enough to change the country's position among other EU member states.

In 2017 important indicators of the national economy are below the EU average and we remain on the last place, incl. the GDP per capita. This indicator is a base for changing the standard of living and for implementation of good national policies in the sectors.

Demographic indicators for **Bulgaria continue to decline, both in terms of population size and age, and in educational characteristics.**

Data over the last four years presented in Table 1.1 show a steady decrease in the population - by more than 50 thousand per year, only in 2017 it is 51.8 thousand. The negative growth is resulting from the low birth rates, high mortality and negative migration processes.

The official NSI data on external migration over the past year show:

immigrants - 25 597 people

emigrants - 31 586 people, respectively a negative mechanical growth by - 5 989 people.

50% of the settled persons have Bulgarian citizenship and 50% are foreigners, 85% of the displaced are Bulgarian citizens, i.e. the native population is decreasing.

These factors could be managed through good national demographic and social policies both in medium and in long term.

Table 1.1

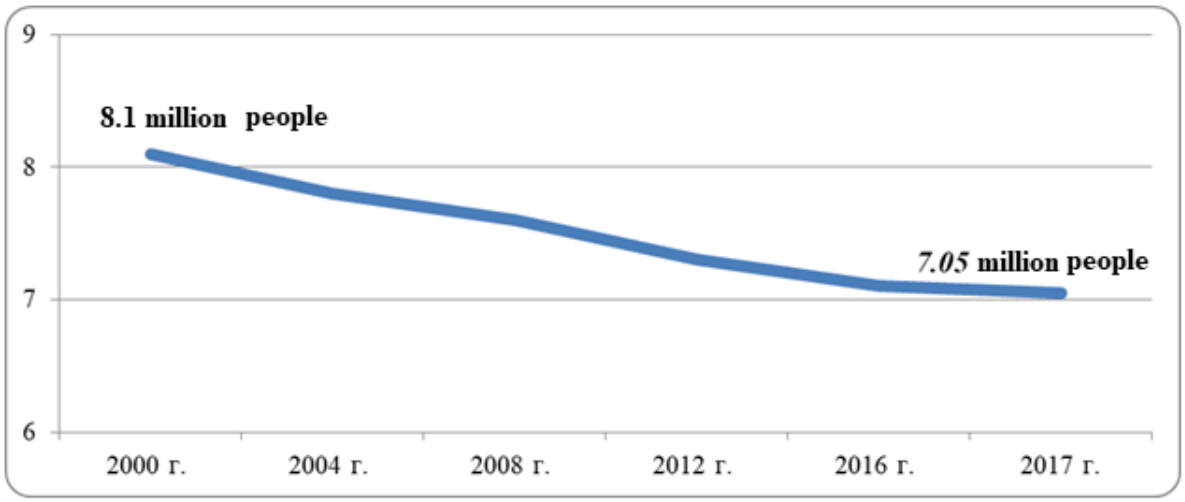
Population by categories, thousand people

Population groups:	2014		2015		2016		2017	
	X 1 000	**%**	**X 1 000**	**%**	**X 1 000**	**%**	**X 1 000**	**%**
City/town population	5 267.5	73.1	5 227.1	73.1	5 204.4	73.3	5 181.8	73.5
Village population	1 934.7	26.9	1 926.7	26.9	1 897.4	26.7	1 868.3	26.5
Males	3 502.0		3 477.2		3 449.9		3 422.4	
Females	3 700.2		3 676.6		3 651.9		3 627.6	
Total:	**7 202.2**	**100.0**	**7 153.8**	**100.0**	**7 101.8**	**100.0**	**7 050.0**	**100.0**

Source: NCI

The ratio urban-to-rural is 3 to 1, changing steadily to the benefit of urban residents. Villages continue to depopulate and for the last five years the share of the rural population is decreased by 0.5%. Both in towns and villages the number of the population is decreasing.

Figure 1.1



Population of Bulgaria, million people

Among all EU member states Bulgaria has the highest negative values in natural growth. Figure 1.1 shows the actual decline of more than 1 million people since 2000.

Low birth rates and the migration of families with children lead to an unfavorable age characteristics. For 2017 the structure of the population by group is as follows:

Under working age - 15%

At working age - 60%, incl. 15-24 years old - 9.3%

Over working age - 25%.

The most promising 15-24-year age group in Bulgaria decreased by 0.3% compared to the previous year; with a share of 9.3% compared to 10.9% of the same age group in the EU (28).

Another demographic indicator relevant to quality and standard of life is the average life expectancy of the population in a respective country. According to NSI data for 2015 **the average life expectancy in the EU is 80.6 years,** for Bulgaria it is **74.7 years** or the average Bulgarian citizen lives 6 years less. For females this difference is 5 years and for the males – ca. 7 years.

In line with the demographic characteristics, the labor market is also changing. In Table 1.2 data are presented on the average **annual number of employees** under labor and service contacts, on labor income and on some social parameters for 2017.

Table 1.2

Average number of employed people, level of unemployment, inflation

Indicators	**2013**	**2014**	**2015**	**2016**	**2017***
Average annual number of persons (national calculations), in thousands	2 174.8	2 203.1	2 254.8	2 277.3	2 230.2
CAverage annual number of registered unemployed, in thousands	436.3	384.5	305.1	247.2	206.9
Average annual level of unemployment (NSI),%	**12.9**	**11.4**	**9.1**	**7.6**	**6.2**
Inflation/ deflation rate	**-2.0**	**-1.4**	**- 0.1**	**- 0.8**	**2.1**
Average monthly wage of persons on labor and service contracts in the country, **BGN**:	**807**	**822**	**878**	**962**	**1 060**
- public sector	839	888	926	984	1 072
- private sector	796	800	863	954	1 052
- incl. processing industry	**668**	**700**	**761**	**846**	**934**
Average monthly wage in activity 24 „Production of basic metals":	**1 129**	**1 178**	**1 187**	**1 303**	**1 446**
● ferrous metallurgy	**1 069**	**1 050**	**1 077**	**1 257**	**1 395**
● non- ferrous metallurgy	**1 617**	**1 661**	**1658**	**1774**	**1969**
● metal casting	**623**	**692**	**740**	**827**	**918**

*Source: NSI, *preliminary data*

From the data for 2017 and the changes compared to previous periods the following conclusions could be drawn:

The number of employees under labor and service contracts from 2013 to 2016 is increasing. For the last **2017** the trend is changing - the number of **employees**

decreased by 47 thousand people, while the unemployment rate is decreasing by 1.4%.

These data call for contradictory conclusions that are not giving a clear picture of the labor market's status. There is a decrease in the number of employed persons, while the number of registered unemployed is also reducing. The reason is due to the impact of other side factors, such as the negative growth and the declining in the working population in Bulgaria, as well as the migration outside the country of young people in working age.

The total number of employees, incl. both employed and self-employed, plus those under other labor contracts amounts to 3.525 million people, i.e. 50% of the total population in the country in 2017.

In 2017 all industrial sectors are reporting a decreased number of employees: mining, manufacturing and construction, and agriculture, while the services are reporting an increase in the employee's number. 50% of the unemployed are having basic/primary education and 30% - even lower. **As a matter of fact, the labor market is not improving.**

Over the whole period under review, the **income of the employees under labor and service contacts is increasing.** The average monthly wage in the country in 2017 compared to the previous year is accounting **a growth by 110%** and for the processing industry this growth is by 112%. For the same one-year **period the productivity measured by GDP per employee shows an increase by 103%** - i.e. there is an overcoming growth in the wages. The 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. This administrative mechanism operates in 2018, too.

The average wage and the average insured income in the metallurgy are still among the highest in the country. In 2017 the average wage in the whole economic activity 24. „Production of basic metals" is BGN 1 446 – i.e. 1.5 times higher than that in the processing industry and only in the non-ferrous metallurgy it is 2 times higher.

The minimum wage in metallurgy is negotiated with the social partners. According to the signed Branch Collective Labor Agreement (BCLA) the minimal wage for the period 2017 – 2018 was increased by BGN 100 – i.e. a growth by 122%. In the last Agreement concluded for the period 2017 - 2018, the minimum wage for employees in the main processing was increased by BGN 100 - a growth by 122%. Higher values have been agreed for other additional payments and social benefits as well.

The metal productions working environment is specific and is a subject to legislation that increases the employer's cost of labor and wages exceeding those costs in other branches.

In metallurgy, mining and energy, **salaries are ca. 70% of all labor costs,** ca. 30% are the other labor costs, while in the manufacturing and services sectors these additional costs are ca. 18%. The difference of ca. 12% is formed by **a higher percentage of social security contributions and social benefits and allowances.**

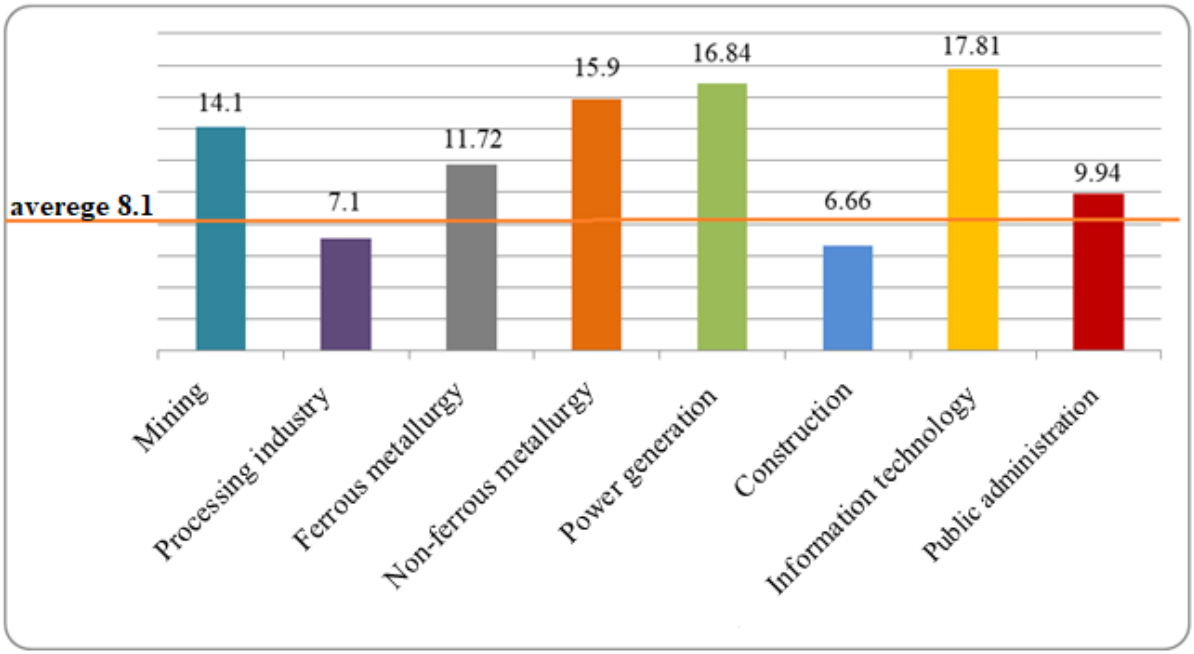
The structure of the costs that employers realized for one employee average for the country and in some industry sectors has the following distribution:

	Wage	Insurances by the employer	Other social bonuses	Others*
Total for the country, %	**82**	**15**	**2**	**1**
- mining	72	19	6	3
- processing **incl. metallurgy**	82 **70**	15 **18**	2 **10**	1 **2**
- energy	70	17	10	3
- water, wastes	82	15	2	1

*incl. compensations paid

Figure 1.2 presents the employers costs per hour for labor in BGN for employees under labor and service contracts in 2016 in the main sectors of industry incl. metallurgy.

Figure 1.2



Employer's labor costs, BGN for one working hour

Source: NSI

Of all economic sectors 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, finance and insurance, and the ferrous metallurgy – i.e. **the ferrous metallurgy is occupying the 6th place** among all economic activities in the industry and services.

Compared to the previous 2016, labor costs in the country increased by 108%, in the non-ferrous metallurgy the increase was by 107% and in the ferrous metallurgy - by 109%.

NSI data about productivity in the country, measured by GDP per capita, shows **a growth by 115% in the period 2014-2017, and in the same period, the average wage shows an overcoming growth by 129%.**

1.2. GDP, GVA, PRODUCTIVITY

In 2017, the world economy reported growth by 3.5%, for the EU (28) the average growth was by 2.1% and for Bulgaria - by 3.6% (expected was a growth by 4.0%).

In the last 20 years the indicator GDP/GVA per capita and in absolute terms is growing, nevertheless the country continues to occupy the last ranking among the EU(28) member states. **In 2017 the real GDP per capita in the EU (28) is EUR 27 600, with a growth by 2.1%** - according to Eurostat**. For Bulgaria this indicator is EUR 6 300 growing by 3.9%** and is in the same time ca. 4 times lower than the average for the EU. Romania is the only other EU country where this indicator is under EUR 10 000 per capita but with an annual growth by 7.3%, reaching EUR 8 200 per capita, i.e. by 30% higher than this in Bulgaria. In 2007, when the both countries became EU member states, the difference in real GDP per capita in Romania and in Bulgaria was EUR 1 100. In 2017, it is already reaching EUR 1 900 due to the overtaking growth of the Romanian economy.

In the new EU members from the CEE region the real GDP is over EUR 12 000 per capita. The highest ranks Slovenia (EUR 19 400 per capita), followed by the Czech Republic (EUR 17 200 per capita) and Slovakia (EUR 15 000 per capita). 11 EU member states report over EUR 30 000 per capita, among them no one of the „new" EU member states.

In 2017 all EU(28) member states report a real GDP growth.

Table 1.3 shows data about the Gross domestic product (GDP) and Gross value added (GVA) for Bulgaria in total and by sectors.

In 2017 the Gross value added **(GVA) was BGN 85 413 million,** and the Gross domestic product **(GDP) - BGN 98 631 million.**

In 2017 the share of the industry in the GVA was 24.1 %, and for industry +construction it was 28.3 %. After 2-years-decrease the agriculture reported an increase by BGN 174 million with a share of 4.3 %. The data show that **in 2017 the real economy produced 32.6% of the country's "wealth" (GVA, respectively real GDP)**, the other 67.4% were created by trade, services, finance and public administration.

Table 1.3

GDP and GVA by sectors and groups, million BGN

Indices:	**2014**	**2015**	**2016**	**2017 ***	
					% of GDP
Gross Value Added (GVA) – current prices, **million BGN**, incl .	**72 608**	**76 546**	**79 937**	**85 413**	**86.6**
- agriculture and forestry	3 823	3 664	3 519	3 693	3.7
- mining and processing industry, power generation, water and sanitation (B-E)	16 501	18 013	19 009	20 606	20.9
- construction (F)	3 225	3 322	3 388	3 574	3.6
- trade, food, transport and communications (G-J)	19 522	20 937	22 039	23 213	23.5
- finance, insurance, real estate and other business services (K,L,M,N)	16 814	17 705	18 806	20 371	20.7
- public administration, education, public healthcare (O-Q), others (R-U)	12 679	12 905	13 175	13 957	14.2
- adjustments/taxes/	11 004	12 025	12 698	13 218	13.4
Gross Domestic Product (GDP), million BGN	**83 612**	**88 571**	**92 635**	**98 631**	**100.0**

*Source:NSI, *preliminary data*

In 2017, **GDP grew by BGN 4 996 million – a comparable growth by 3.6%** and GVA - by 3.7%. All economic sectors/groups reported higher performance compared to the previous year.

Table 1.4 shows the latest NSI data about the value of production by activities /sectors of the Bulgarian industry and other major economic indicators for 2016 as well.

Table 1.4

Industry, key economic indicators

CEA 2008 / INDICIES	**2013**	**2014**	**2015**	**2016**
INDUSTRIAL PRODUCTION TOTAL	**64 034**	**63 446**	**66 105**	**66 376**
Mining /Sector B/				
- produced output, million BGN	2 557	2 433	2 435	2 496
- value added, million BNG	1 299	1 162	1 107	1 136
- employees, number	24 635	24 105	24 025	24 969
- value added per employee, thousand BGN	**52.7**	**48.2**	**46.1**	**45.5**
Processing industry /Sector C/				
- produced output, million BGN	51 076	52 383	54 354	54 773
- value added, million BNG	9 345	10 379	12 192	13 985
- employees, number	524 041	538 017	546 672	545 187
- value added per employee, thousand BGN	**17.8**	**19.3**	**22.3**	**25.7**
24. Production of basic metals - produced output, million BGN - value added per employee, thousand BGN **incl. in the NF metallurgy, thousand BGN**	 **7 436** **38.8** **68**	 **7 310** **52.3** **94.7**	 **7 412** **56.8** **119.9**	 **6 780** **66.3** **123.6**
Power generation /Sector D/				
- produced output, million BGN	9 043	7 275	7 899	7 627
- value added, million BNG	3 323	2 541	3 134	3 398
- employees, number	32 809	32 569	31 771	32 147
- value added per employee, thousand BGN.	**101.3**	**78.0**	**98.6**	**105.7**
Water supply, sanitation, waste management /Sector E/				
- produced output, million BGN	1 358	1 355	1 417	1 480
- value added, million BNG	675	678	739	752
- employees, number	34 097	32 757	33 169	33 403
- value added per employee, thousand BGN	**19.8**	**20.7**	**22.3**	**22.5**

Source:NSI

The total industrial production was worth BGN 66 374 million, by BGN 271 million more than in 2015. In the previous one-year period the corresponding increase was by BGN 2 659 million, i.e. the growth rate slowed. The largest share of 82.5% is due to the processing industry, part of which is the metallurgy.

The processing industry shows the highest growth (by BGN 419 million), a small growth shows the mining industry (by BGN 61 million) and the water supply and waste management (by BGN 63 million). In 2016 there was a decrease in production volume reported by the power generation and metallurgy. The value of the metallurgical industry production decreased by BGN 630 million due to the large renovations in the copper production sites in 2016. Nevertheless, the relative share of metallurgy remains high – in the industrial production by value it was 12.4% and 10.2% of the total output of the country. Data about the value of metallurgical production in 2017 are not available yet, but the volume of produced metals shows a high growth. Produced were more than 100 000 tons of non-ferrous metals and products - this will increase the sector's indicators in value and as a relative share of the total country output.

The indicator „value added per employee“ in the metallurgy is growing -total for the sector it comes to **BGN 66.3 thousand/employee and remains two times higher than** the average in the industry (BGN 30 thousand/employee), and for several years higher than the same indicator of the mining (BGN 45.5 thousand/employee). This **NF metallurgy indicator is one of the highest in the country – BGN 123.6 thousand/employee -** ca. four times higher than the average in the industry and five times higher than in the processing industry (BGN 25.7 thousand/employee).

The investments made by the metallurgical companies lead to cost reductions, incl. for energy and implementation of new products with higher value added. All these resulted in higher economic performance, such as productivity and value added per employee.

The main technological and economic indicators of the Bulgarian metallurgy are characterizing the activity as competitive and with development potential, highly significant for the national and for the EU economy.

1.3. ENERGY CONSUMPTION

Metallurgical production and technological processes are especially characterized by high energy consumption due to high temperature processes of the metal heating, smelting, plastic deformation and electrolytic refining. This makes the metal production strongly dependent on the energy market and energy prices, on policies and regulations, on the fair distribution of financial burdens and rising prices of energy from renewable sources.

In order to compensate for the negative impact of the increased electricity prices in 2017, an **ORDINANCE № E-RD-04-06 /2016 was adopted on reducing the burden related to the costs of energy from renewable sources**. The aid scheme shall operate for the period from August 1, 2015 to December 31, 2020, the amount being fixed for each pricing period.

In the current 2018, there are activities towards extended the scope and electricity from co-generation to be included in the above mentioned ordinance.

The **NSI reports for 2016** a total energy consumption by the industry of 2 701 thousand tons of petroleum equivalent (p.e.) - by **67 thousand tons p.e**. lower compared to 2015. A process of reducing the energy cost per unit production is visible. By type of energy resources the highest share has the natural gas – 918 thousand tons p.e. or 35%, followed by the electricity with 767 thousand tons p.e. and 29% respectively. The remaining 36% of the total amount energy sources are occupied by solid and liquid fuels, thermal energy from waste incineration etc.

The total consumption of **energy resources in households is reaching 86% of that in the industry** and amounts to 2 213 thousand tons p.e. The largest share has the electricity consumption - 923 thousand tons p.e. and 40.8% respectively, and this quantity exceed by 156 thousand tons p.e. the electricity consumption in the industry.

There is still a very low level of household gas consumption - a share of 2.3% in the energy balance of this consumer group. The high electricity consumption is due to the existing cross-subsidization of household consumers by the industry, to price retention, and does not stimulate demand for alternative fuels.

According to the national energy balance of the NSI (2016), the total **energy consumption in the metallurgy was 241000 tons p.e., by 2 000 tons p.e. less than in 2015 (243 000 tons p.e.). This was 9.1% of the total industrial consumption in the country, and remained** at the same level as in the previous year.

In the period 2011- 2016, the total energy consumption in the ferrous and non-ferrous metallurgy was reduced by more than 15%, though a significant

increase in the quantities produced. **The energy efficiency in the sector is improving**.

The share of the ferrous industry was 46% of the total energy consumption with a small increase by 1% (111 thousand tons p.e.) and 54% (130 thousand tons p.e.) was the respective share of the non-ferrous metallurgy.

The metallurgical **industries reported the highest consumption of electricity - 128 thousand tons p.e.,** which was **17% of the total electricity consumption of the industry**, followed by the chemical industry with 109 thousand ton p.e. and a share of 14%, and the food industry with 105 thousand tons p.e.

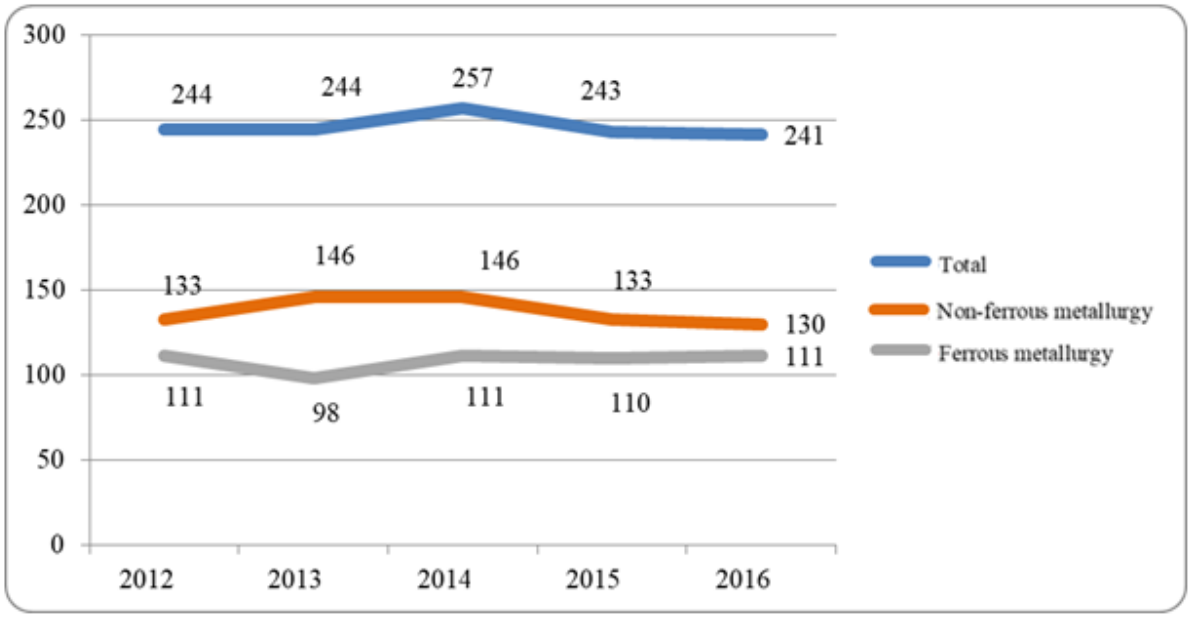
Electricity consumption in non-ferrous metallurgy was 66 thousand tons p.e. (a decrease by 11%), in the ferrous industry it was 62 thousand tons p.e. (an increase by 1.6%).

The consumption of natural gas maintained at the level as in the previous year (81 000 tons p.e.), 60% of which were consumed by the ferrous and 40% - by the non-ferrous metallurgy.

The share of the metallurgical industry in the total gas consumption of the industry in 2016 was 8.8% and was almost at the level as in 2015 (9%).

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

Figure 1.4



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

Changes in the metallurgical production structure and in the increasing share of the non-ferrous metallurgy change the structure of the energy sources as well.

Due to available significant and sustainable developing capacities in the country for metal ingots production, in the next years the sector will be one of the biggest electricity consumers. Expansion of the gas distribution network will also lead to increased natural gas consumption, while liquid and solid fuels have little application.

1.4. FOREIGN TRADE EXCHANGE, IMPORT AND EXPORT OF GOODS

Many sectors of the Bulgarian industry are export oriented, and the main part of their production is realized on European markets. After the accession to the EU, the Bulgarian export to the member states is more than 60% (in 2017 - 66%) and 50-55% of the Bulgarian import is coming from those states. Despite the increasing export of goods, the import of the same goods is still higher and so a negative balance is formed amounting to several thousand BGN.
Bulgarian metallurgical production is realized mainly on foreign markets - metals, and metal products are taking a significant place in the country's portfolio.
Data on Bulgaria's imports and exports over the past five years are given in Table 1.5. Mentioned are also the values of imported and exported metallurgical products (incl. metal waste).

Table 1.5

Foreign trade balance in the goods exchange, milliard BGN

Indicators:	**2013**	**2014**	**2015**	**2016**	**2017**
Import of goods, incl.	**50.5**	**51.2**	**51.6**	**51.2**	**59.1**
From EU (28)	24.6	25.8	27.3	28.0	30.2
- metal products	3.3	3.6	3.5	3.6	4.2
relative share, %	**6.5**	**7.0**	**6.8**	**7.0**	7.1
Export of goods, incl.	**43.5**	**43.2**	**45.5**	**47.2**	**52.2**
for EC(28)	26.1	26.9	29.1	31.1	34.5
- metal products	6.7	6.1	6.1	6.3	9.3
relative share, %	**15.3**	**14.3**	**13.2**	**13.4**	**17.8**
Foreign trade balance, incl.	**- 7.0**	**-7.9**	**-6.1**	**-4.0**	**-6.9**
- metal products	**+ 3.4**	**+2.5**	**+2.6**	**+2.8**	**+5.1**

Source:BNB/NSI; for metal imports – Customs/NRA

As an indicator of competitiveness and growth of the Bulgarian economy, the total goods export shows for 2017 an increase in value by 5 milliard BNG compared to 2016 (a growth by 110.5%). The import of goods increased by BGN 7.9 milliard and accounts an overtaking growth by 115%. As a result, the

negative foreign trade balance is increasing by BGN 2.9 milliard, reaching **BGN 6.9 milliard -** the highest value over the last three years.

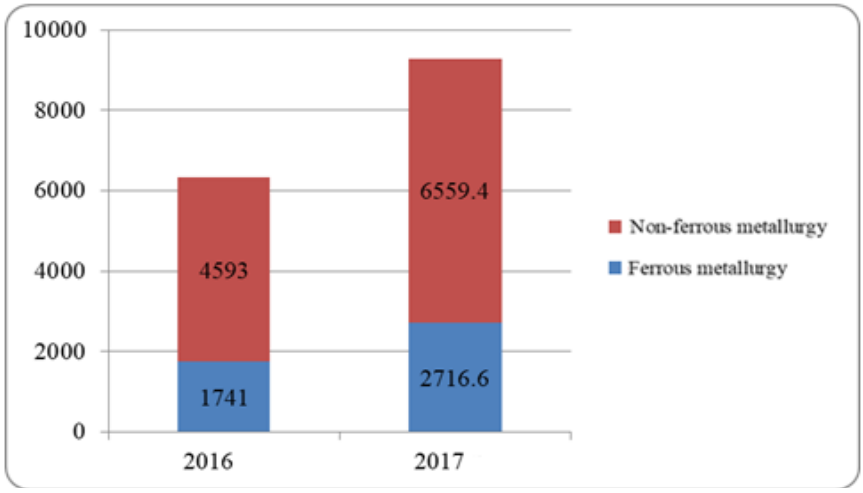
Due to the changes of the Bulgarian economy structure during the transition years, metals and metal products occupy the main place in the country's stock portfolio. The goods produced by the metallurgical industry have a high relative share of the country export - over the last few years it is between **13% and 18%.** Metals are realized at stock's exchange and so the value of the export is determined by the world market prices, besides by the amount of exported metals.

The total foreign trade turnover of metals formed over the years a positive balance amounting to several billion BGN contributing to the improvement of the country's foreign trade indicators.

After 2011 the trade balance in the ferrous metallurgy is negative, with a trend this negative difference to grow both in terms of value and in volume. Since the main production capacities in the country were closed, the existing production is not able to provide a variety of ferrous metal products by type and assortment, therefore imports are significant in order to cover the domestic demand (over BGN 2 milliard).

Figure 1.5 shows BNB/NSI data about the export's value over the last two years of the group „Non-precious metals and products of them" - Customs Tariff Section XV. Data are given for the two subgroups - ferrous metals (Chapter 72 and Chapter 73 of CT) and non-ferrous metals, incl. products thereof, classified according to the realized export.

Figure 1.5



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

The given value about non-ferrous metals exports in 2017 includes the exported pipes, which were imported in 2014 within the project „South Stream", i.e. a re-export. Exports of smaller quantities of these pipes occurred in 2016, too and so complicating the assessment of the real Bulgarian industry contribution to the increased ferrous metals exports.

The Bulgarian processing industry is characterized by a high specialization in the production of basic non-ferrous metals and alloys and finished products. They are well positioned on the world markets, with established positions and high quality. Over the last years the foreign trade of **non-ferrous metals generated a positive balance amounting to BGN 3-4 milliard.**

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, million BGN

Goods groups	2013 г.	2014 г.	2015 г.	2016 г.	2017 г.
Consumer goods, incl.	5211.8	5736.2	6096.0	6465.0	6715.9
• Foods	1089.3	1196.8	1332.0	1434.7	1621.0
• Cigarettes	214.7	226.0	204.9	149.7	136.2
• Beverages	101.4	85.4	89.5	96.7	100.1
• Clothes and shoes	1553.5	1608.6	1582.7	1710.9	1645.0
• Pharmaceuticals and cosmetics	803.3	928.7	973.8	1007.4	1070.1
• Furniture and home interior	775.4	880.2	990.3	1038.7	1073.7
• Other consumer goods	674.2	810.4	922.9	1026.9	1069.8
Raw materials. incl.	9678.5	9121.4	9409.2	9393.7	10556.1
• ***Pig iron, iron and steel***	***618.0***	***549.2***	***411.8***	***402.6***	***533.8***
• ***Non-ferrous metals***	***2407.5***	***2231.4***	***2296.4***	***1808.0***	***2734.7***
• Chemical products	310.9	334.7	379.3	325.5	400.8
• Plastics, rubber	657.7	717.9	800.7	846.5	941.1
• Fertilizers	168.8	191.9	244.0	220.1	197.4
• Textiles	399.9	422.9	477.4	519.6	552.1
• Raw materials for food production	2309.6	1844.1	1782.0	2064.0	1879.7
• Wood and paper, cardboard	440.1	474.7	489.5	496.4	509.2
• Cement	22.0	17.1	24.0	30.7	33.1
• Tobacco	167.9	133.0	126.9	168.2	123.4
• Other raw materials	2176.0	2204.5	2377.2	2512.1	2650.9
Investments good, incl.	3970.3	4302.3	4880.9	5764.4	6898.6
• Machines, apparatus	1141.6	1208.6	1248.6	1334.3	1529.5
• Electrical machines	548.0	502.4	557.7	685.0	784.3
• Vehicles	410.1	410.1	473.4	516.5	627.7
• Spare parts and equipment	1062.4	1149.1	1270.7	1414.9	1553.1
• Other investments goods	808.3	1032.0	1330.6	1813.7	2404.0
Total non-energy stocks, incl.	**18860.6**	**19159.9**	**20386.1**	**21623.2**	**24170.6**
Total energy resources	3385.0	2911.2	2554.8	2456.0	2488.2
• Petroleum products	2904.0	2368.7	1903.6	1703.5	1639.1
• Other different from petroleum products	481.0	542.5	651.3	752.5	849.1
Others	25.9	33.9	41.3	46.8	54.4
Export total	***22271***	***22105***	***22982***	***24126***	***26713***

Source: BNB

Data about exported ferrous and non-ferrous metals **do not include all articles of these metals –** as far as some of them are defined as „other raw materials“. So the impact of the re-export of the pipes from the „South Stream“ project was eliminated.

Data show that in the last year the export of metals increased by more than BGN 2 milliard, in the ferrous metallurgy it was a growth by 133% and in the non-ferrous metallurgy - by 151%. The growth of the total country export was by 110%.

The **export of non-ferrous metals has the highest value among all goods groups mentioned.** Again this is confirming the country's specialization in this activity and high competitiveness achieved based on the large investments in the metallurgical companies.

1.5. METALLURGICAL INDUSTRY IN EU AND IN BULGARIA

Modern world and way of life are impossible without metals, alloys and products of them. They are important raw materials in the value chain in all industry branches and in the 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. Therefore they are in the focus of the EU in implementing resource efficient policies and a move to circular economy.

The current crisis situation on the world markets, incl. the metals trade exchange, is forcing economies to look for opportunities to reduce the dependency on external supplies. This is also a policy of the European Commission applying measures in protection of the affected industries, incl. the metals production.

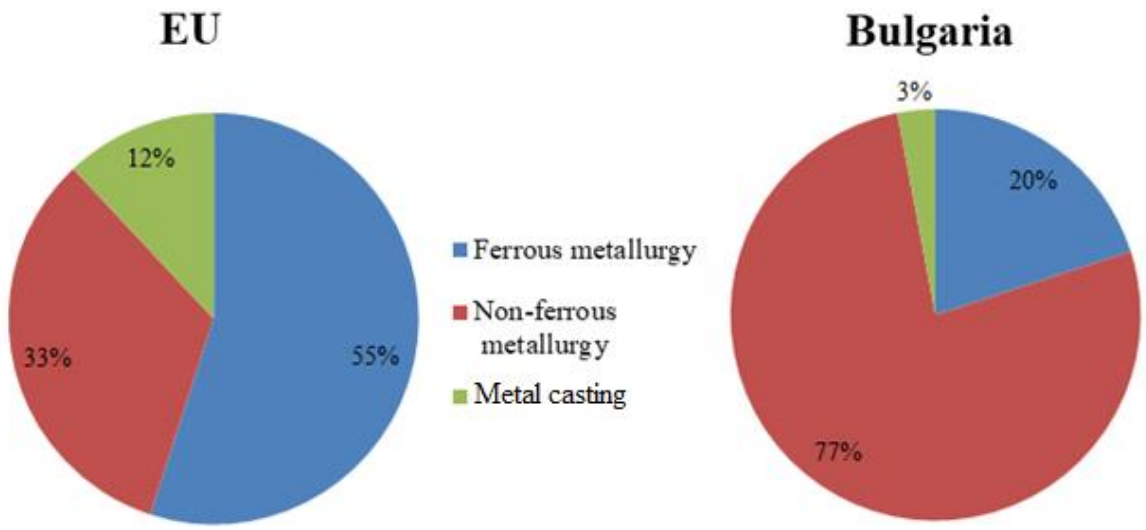
From Asian countries, mainly **China is the largest producer of metals accounting for more than 50% of the world basic metals production** - steel, copper, zinc and lead, which Bulgaria is producing as well. The **EU** is also an important producer of these metals - in the world ranking it occupies **second place in the production of steel and zinc, and third place in electrolytic copper and lead**.

Although after the last economic crisis the EU has set the „Industry Renaissance“ on the agenda, from 2011 until now the value of industrial output within economic activity **24. Production of basic metals** is decreasing with every year. For example in 2016, compared to the previous 2015, the total value of metals (C.24 of NCEA) decreased by EUR 20 milliard, respectively by 6%. According to preliminary EUROSTAT data, the EU(28) produced in 2016 metals and metal products worth EUR 310 milliard, incl. the value of the

Bulgarian metal production worth EUR 3.5 milliard or 1.12% of the total (1.15% in 2015, i.e. a decrease by 8%). However among the EU member states Bulgaria remains on 16th place in terms of production's volume.
The biggest metal producer in the EU is Germany –with EUR 88 milliard (a decrease by 9% on an yearly base) and a share of 28% of the total volume produced, Italia ranks next with production worth EUR 52 milliard (same volume as in the previous year) and a share of 17%. Other big producers are France (EUR 24.7 milliard) and Spain (EUR 24.1 milliard).
From the CEE countries Poland produced the largest volume – worth EUR 10.5 milliard and Czech Republic – EUR 6.5 milliard. In terms of value close to Bulgaria are Greece – EUR 3.7 milliard, Romania – EUR 3.4 milliard and Slovakia – EUR 3.8 milliard.

The relative weight of the ferrous metallurgy was significant within the total structure of the EU metallurgical sector and in 2016 had a share of 55%, respectively the non-ferrous metallurgy's share was 33% and the share of the metal casting – 12% . Figure 1.4 shows this ratio in the EU (28) and in Bulgaria, according to EUROSTAT preliminary data for the same year.

Figure1.4



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

In 2015 the EU produced ferrous metals and R/P products worth EUR 170.7 milliard, non-ferrous metals worth EUR 102.7 milliard and casted metals worth EUR 37.6 milliard.
Metallurgy in Bulgaria is highly specialized in the non-ferrous metals production with a trend in the next years its relative share to grow. In 2014 this share was 82.4%, in 2015 – 84.5% but in 2016 it decreased to 77%. The

temporary decrease is due to renovations in the copper production units. For 2017 the non-ferrous metallurgy is expected to reach a share of more than 85%.
In 2016 in Bulgaria were produced non-ferrous metals, alloys and products worth EUR 2.7 milliard or 2.6% of the value of the EU total production under C24.4 - NCEA „Production of basic precious and other non-ferrous metals".
The main countries producing non-ferrous metals and products of them are shown in the next table, where the value of the production over the last 2 years is given as well:

Country	Value, milliard Euro		Share, %
	2015	2016	
TOTAL EU(28), incl.	**109.3**	**102.7**	**100.0**
Germany	33.9	31.7	30.9
Italy	14.1	13.9	13.5
Spain	10.1	8.9	8.7
France	8.4	8.1	7.9
Belgium	8.2	7.4	7.2
UK	7.7	6.8	6.6
Austria	4.6	4.4	4.3
Sweden	3.9	3.9	3.9
BULGARIA	**3.2**	**2.7**	**2.6**
Greece	2.5	2.6	2.5
Poland	2.5	2.5	2.4
Finland	2.2	2.1	2.0
Remaining EU countries	8.0	7.7	7.5

Source: Eurostat, month of May 2018

Bulgaria remains on its 9th place among the EU member states in the ranking of non-ferrous and pricaous metals production in value. The countries not mentioned in the table have production ca. EUR 1 milliard or under it.
In 2017 the EU has a share of 12% of the total world electrolytic copper production, 16% of the world lead production and 15% of the world zinc production.
For these excellent ranking of the EU industry in the world production, Bulgaria has contributed with 8.4% of the electrolytic and 16.5|% of the anode copper, produced in the EU. By the zinc ingots this share is 4% and by the lead - 6%.

SECTION TWO

FERROUS METALLURGY IN BULGARIA

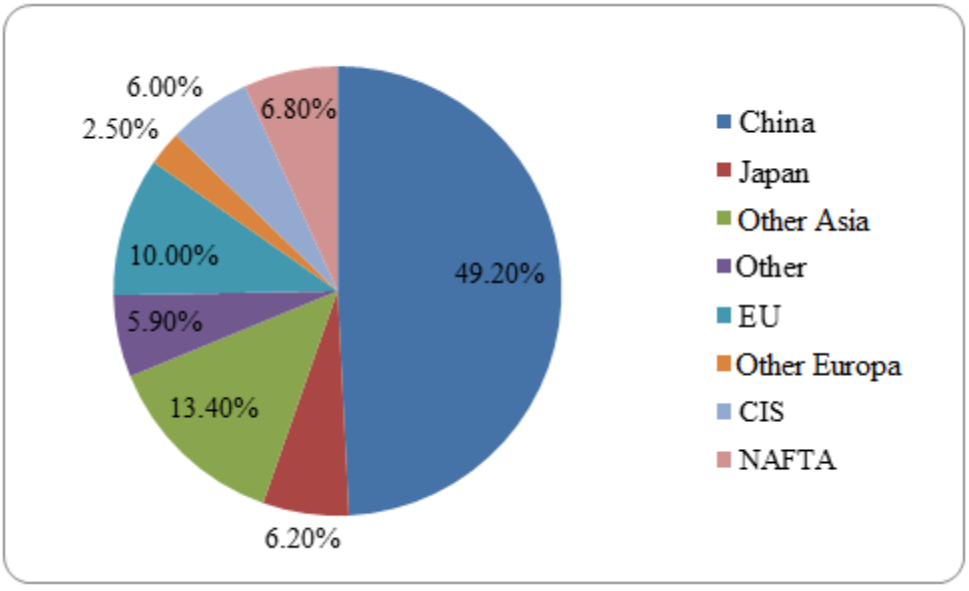
2.1. PRODUCTION OF FERROUS METALS AND ROLLED FERROUS METALS

2.1.1. STEEL PRODUCTION IN EU AND IN THE WORLD FOR 2016

Steel is the most universal industrial material in the world. All sorts of alloys, rolled metals and their products are most widely used in important industrial sectors and in the household. They are the main raw material for the production of machines, equipment and tools, widely used in the automotive and transport engineering, in the construction and energy sector. The capability of a national steel production to meet the domestic consumption is important for any developed country, making the sector particularly sensitive to fair international competition and market rules.

In 2017 the total world crude steel production was **1 689 million tons** - compared to the previous year it decreased by 59 million tons. For years incl. 2017, China ranks first in terms of steel production with a share of 49.2% of the whole world production. The EU(28) production is on the second place, Japan follows – 104.7 million tons, India – 101.4 million tons, the USA - 81.6 million tons and Russia with 71.3 million tons. Within the European countries the largest producers are: Turkey - 37.5 million tons (by 4.3 million tons more than in the previous year) and Ukraine – 21.3 million tons.

Figure 2.1



Main world producers of crude steel, by countries, million tons, 2017

The world's largest steel producers are corporate structures; for 2017 they report crude steel production in million tons, as follows:

1. Arcelor Mittal – 97.3
2. China Baowu Group – 65.39
3. NSSMC – 47.36
4. HBIS Group – 45.56
5. POSCO – 42.19
6. Shagang Group – 38.38
7. Ansteel Group – 35.76
8. JFE Steel – 30.15
9. Shandong Group – 21.68
10. Tata Steel Group – 25.11

In 2017 the raw steel production in the EU was **168 457 thousand tons – by 6 435 thousand tons more compared to the previous year.** Data show that the sector is returning to better positions, with levels in production and employment characterized as stable or even rising.
The European steel industry is a world leader in innovation and ecological sustainability. It secures ca. 320 000 highly qualified jobs and supports indirectly another more than 2 million jobs.

In 2017 among the **EU member states**, the leading producers with a relatively high share of the total raw steel production were:

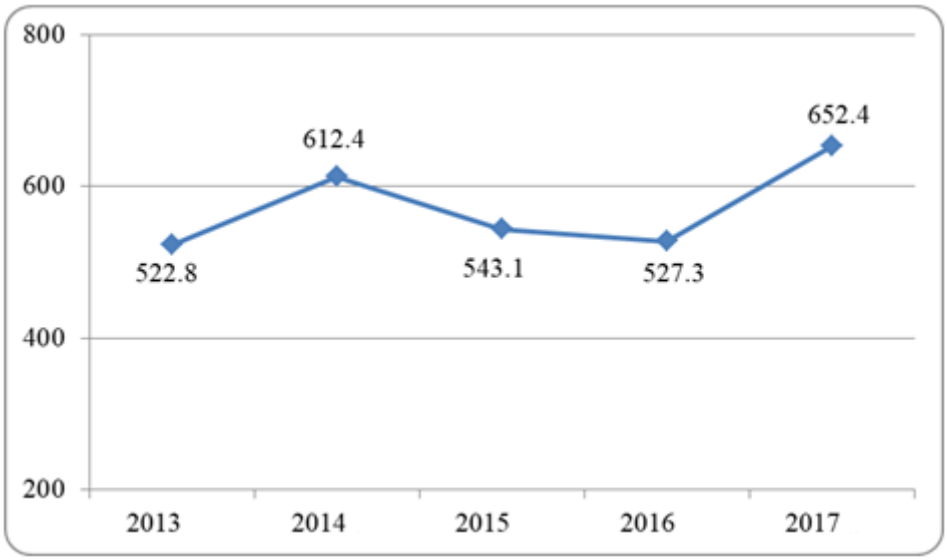
1. Germany – 25.7 % (43.4 million tons)
2. Italy – 14.3 % (24.1 million tons)
3. France – 9.2 % (15.5 million tons)
4. Spain – 8.6 % (14.5 million tons)
5. Poland – 6.1 % (10.3 million tons)
6. Austria – 4.8 % (8.1 million tons)
7. Belgium – 4.6 % (7.8 million tons)
8. UK – 4.5 % (7.5 million tons)

The closure of capacities for liquid steel production in Bulgaria placed our country in the small producers' group, our production is comparable with this in Slovenia (ca. 700 000 tons). EU member states in the region reported in 2017 an increase of the production - Greece reported 1.4 million tons and in Romania – 3.3 million tons. Among the „new“ CEE countries leader is Poland - with an annual production of over 10 million tons, followed by Slovakia – 5 million tons and the Czech Republic - 4.7 million tons.
Bulgaria's share of the EU liquid steel production in 2017 was 0.39%.

2.1.2 CRUDE STEEL PRODUCTION IN BULGARIA

In Bulgaria only „Stomana Industry“ JSC is producing crude steel - in electric furnaces from scrap. In 2017 the quantity of crude steel produced was 652.4 thousand tons – this is an increase by 125.1 thousand tons (19%) compared to 2016 (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 optimizing the production processes, protecting the environment and ensuring better health and safety working conditions.

2.1.3. PRODUCTION OF ROLLED FERROUS METALS

In Bulgaria producers of rolled ferrous metals (RFM) are „Stomana Industry“ JSC and „Promet Steel“ JSC. 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 2017 in Bulgaria was 909.8 thousand tons - compared to 2016 there was a decrease by 11.4 thousand tons or 1.2%; 646.9 thousand tons of those were long rolled products (71%) and 263.9 thousand tons - flat rolled products (29%).

In 2017 by the flat rolled steel an increase by 81.8 thousand tons (44.9%) was reported and by the long rolled steel – a decrease by 92.2 thousand tons (12.5%), compared to the previous year 2016. Data for the last several years are shown in Table 2.1. and Figure 2.3.

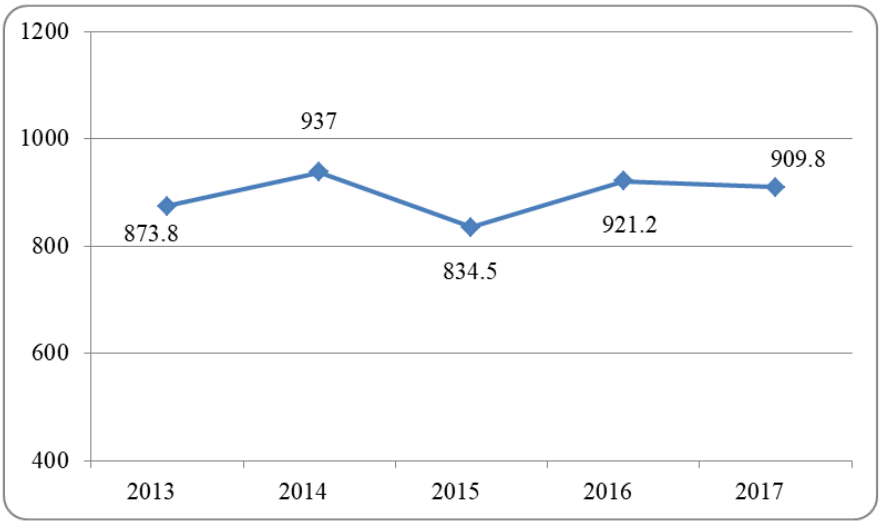
Table 2.1

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

RFM assortment:	Companies	2013	2014	2015	2016	2017	2017/16 +/-	2017/16 %
HR long	„Promet Steel“ JSC	381.0	343.6	329.1	417.1	262.9	-153.2	63.3
	„Stomana Industry“ JSC	272.3	286.4	292.5	322.0	383	61	118.9
	„Helios Metallurg“ Ltd	26.4	34.0	0.0	0.0	0.0	0.0	0.0
	Total	**679.7**	**664.0**	**621.6**	**739.1**	**646.9**	**-92.2**	**87.5**
HR flat	„Stomana Industry“ JSC	**194.1**	**273.0**	**212.9**	**182.1**	**263.9**	**81.8**	**144.9**
HR metal total	„Promet Steel“ JSC	381.0	343.6	329.1	417.1	262.9	-154.2	63.0
	„Stomana Industry“ JSC	466.4	559.4	505.4	504.1	646.9	142.8	128.3
	„Helios Metallurg“ Ltd	26.4	34.0	0.0	0.0	0.0	0.0	0.0
Total		**873.8**	**937.0**	**834.5**	**921.2**	**909.8**	**-11.4**	**98.8**

Source: Company data

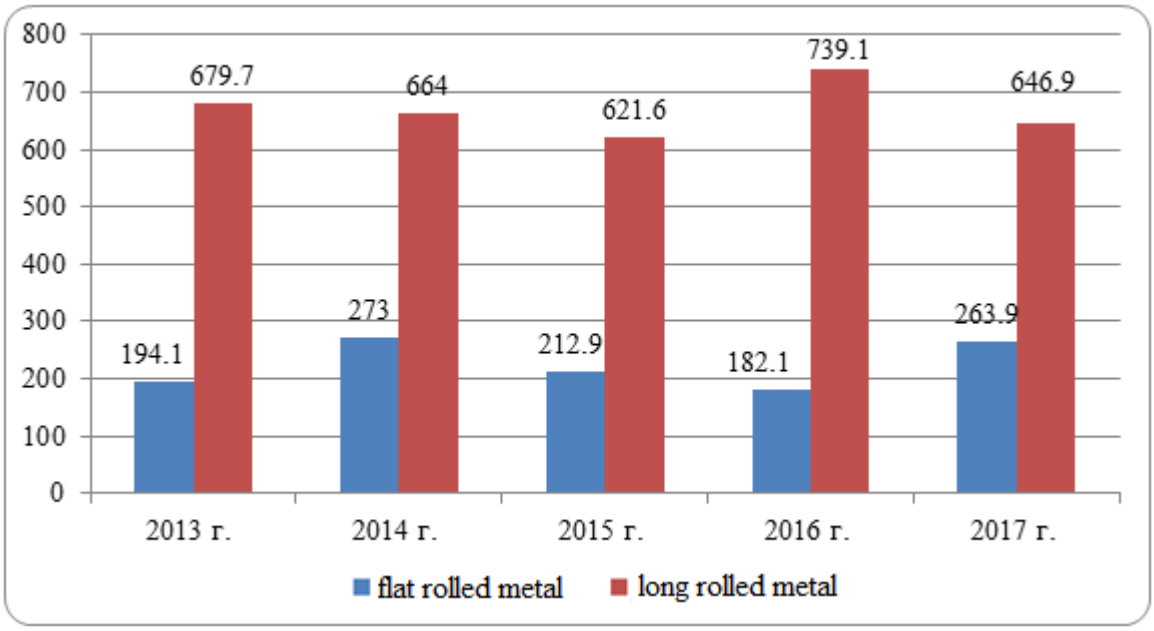
Figure 2.3



Production of flat and long rolled metals, thousand tons

There was a significant reduce the production of long rolled steel in „Promet Steel“ JSC - by 153.2 thousand tons or 36.7%, due to the difficult supply of waste imports (from Ukraine). „Stomana Industry“ JSC reported a growth both in the long HR steel and in the flat HR steel by 61 000 tons and by 81 800 tons respectively or a total increase by 142 800 tons. However, the lagging behind „Promet Steel“ can not be commenced and so the total production in the ferrous industry in 2017 shows a decrease by 11.4 thousand tons (1.2%).

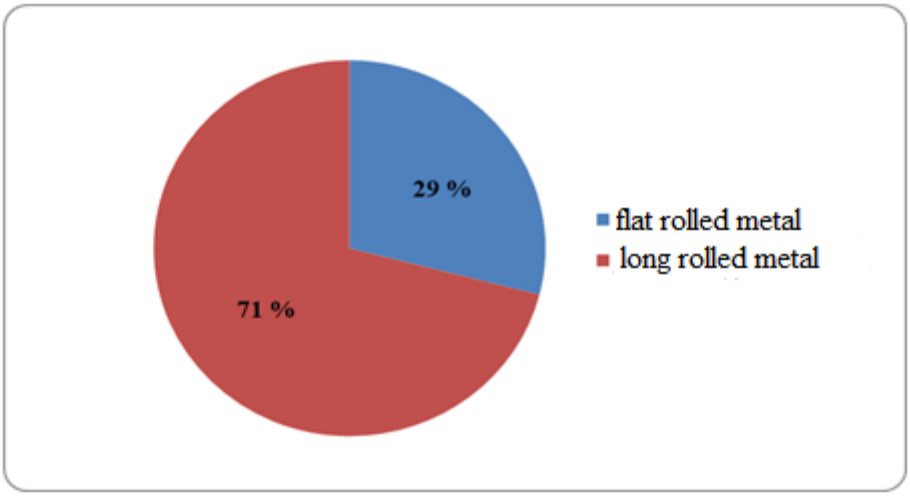
Figure 2.4



Production of flat and long rolled metal, thousand tons

The graph in Fig. 2.4 is showing the production of long and flat rolled metals in the country over a five years period. The ratio long/flat varies depending on the markets and on the production capacities of both enterprises - Fig. 2.5 shows this ratio in 2017.

Figure 2.5



Production of flat and long rolled metal, 2017, %

2.1.3. 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. The quantities of RFM produced in 2017 by companies BAMI-members are given in Table. 2.2.

Table 2.2

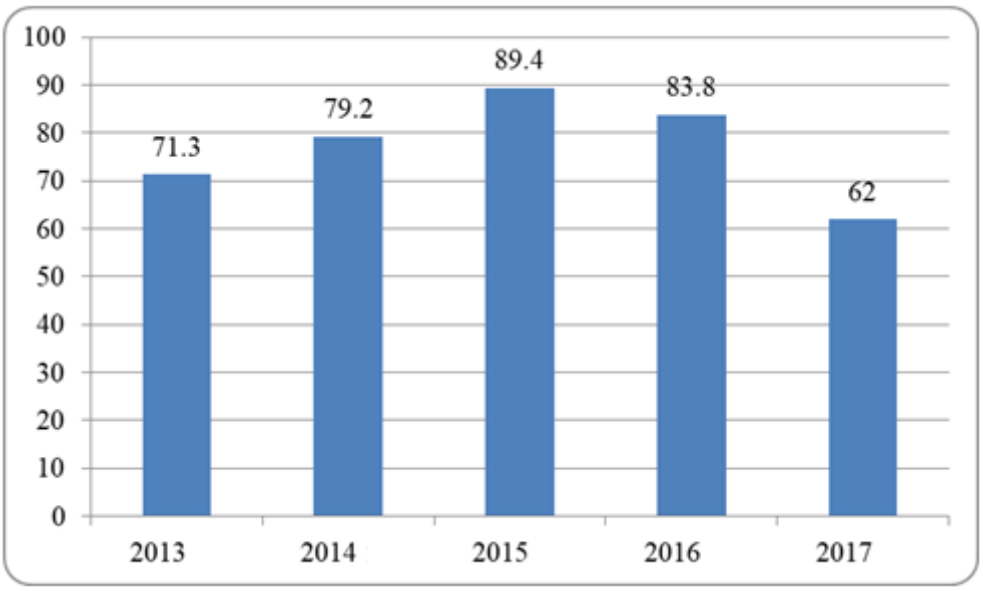
Production of RFM articles by companies and assortment, thousand tons

Articles	Companies	2013	2014	2015	2016	2017	2017/16 +/-	2017/16 %
Steel pipes, welded	„PIH Industry“ JSC	46.5	48.8	48.0	50.8	33.1	-17.7	65.2
Steel balls for mills	„El Stomana“ JSC	11.1	17.2	29.4	19.9	14.4	-17.7	65.2
Wire and wire articles	„ZHITI“ JSC	13.7	13.2	12.0	13.1	14.5	-17.7	65.2
Total RFM articles:		**71.3**	**79.2**	**89.4**	**83.8**	**62.0**	**-21.8**	**74.0**

Source: Company data

The given information is only on RFM production from the BAMI-structure and is part of the total production in the country. For example, besides PIH Industry AD there are other manufacturers of welded pipes but they are not providing any information. „El Stomana“ JSC is producing steel balls for mills, but the production infrastructure and the slugs are supplied by „Stomana Industry“ JSC. The largest enterprise for wire and wire products is ZHITI JSC, Rousse.

Figure 2.6



Production of RFM products, thousand tons

2.2. TRADE TURNOVER AND CONSUMPTION OF RF METALS AND PRODUCTS

2.2.1. IMPORT OF SCRAP, RFM AND PRODUCTS

The total quantity of rolled ferrous metals (RFM) and products of them imported in 2017 incl. scrap, reached **1 899.6 thousand tons**. Compared to 2016, the imported quantities show a decrease by **177.2 thousand tons** (8.5%).
Despite the reduced quantities of imported metal products, **their value is higher - BGN 2 235.5 million - by BGN 122.8 million more** than in the previous year. Table 2.3 shows the quantities of imports by good's groups. The decrease in volume is due to two positions – the semi-products for the production of long RFM in „Promet Steel" and the import of welded pipes.

Table 2.3

Import of ferrous metals and products of them, thousand tons

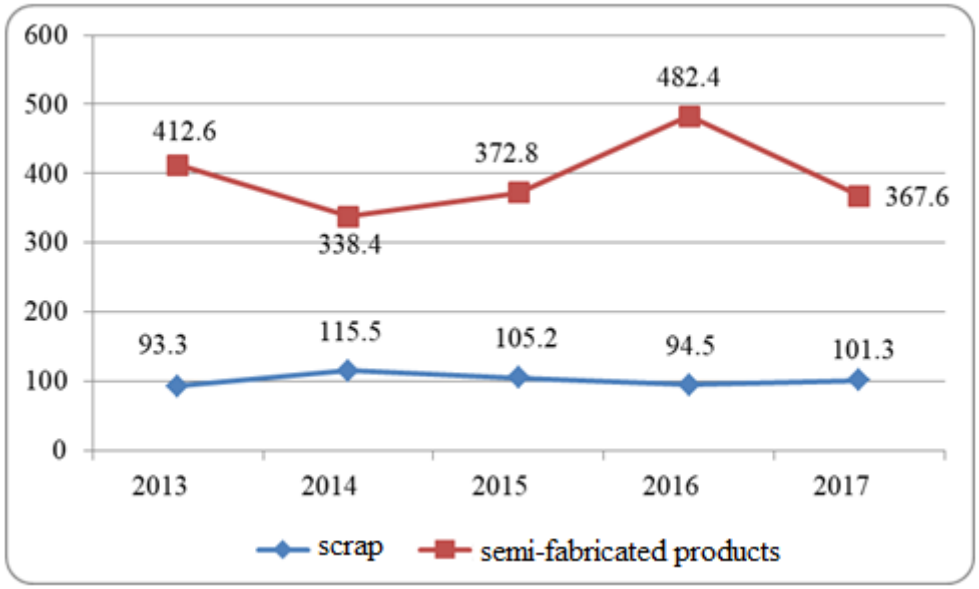
Goods:	2013	2014	2015	2016	2017	2017/16 +/-	2017/16 %
Non-alloyed - total	**1309.3**	**1233.5**	**1455.2**	**1545.2**	**1506.6**	**-38.6**	**97.5**
Pig iron, ingots, granules, powder	20.6	15.7	19.7	15.2	16.8	1.6	110.5
Ferroalloys	14.3	16.5	13.8	11.4	15.7	4.3	137.7
Scrap	93.3	115.5	105.2	94.5	101.3	6.8	107.2
Semi-finished products	412.6	338.4	372.8	482.4	367.6	-114.8	76.2
HR metal (coils and sheets)	383.4	361.9	492.2	511	509.8	-1.2	99.8
CR metal (coils and sheets)	107.9	113.1	122	122.1	135.4	13.3	110.9
Rolled wire	128	114.3	118.2	120.5	126.8	6.3	105.2
Bars	90	97.3	141	113.9	157.5	43.6	138.3
Profiles	59.2	60.8	70.3	74.2	75.7	1.5	102.0
Alloyed - total	**68.9**	**75.5**	**72.2**	**83.9**	**94.6**	**10.7**	**112.8**
HR and CR coils and sheets	38.5	43	39.8	43.5	54.1	10.6	124.4
Bars and profiles	30.4	32.5	32.4	40.4	40.5	0.1	100.2
RFM Products	**288.5**	**664.2**	**322.7**	**447.7**	**298.4**	**-149.3**	**66.7**
Seamless pipes	49.6	30.1	28.2	33.8	36.5	2.7	108.0
Welded pipes	35.5	470.2	112.5	218.1	46.8	-171.3	21.5
Coated sheets	129.7	133.4	154.1	168.3	190.8	22.5	113.4
Wires, ropes etc.	73.7	30.5	27.9	27.5	24.3	-3.2	88.4
Total:	**1666.7**	**1973.2**	**1850.1**	**2076.8**	**1899.6**	**-177.2**	**91.5**
Value, EUR million	**924**	**1340.8**	**985.1**	**1080.2**	**1143.1**	**62.9**	**105.823**
Value, BGN million	**1807.2**	**2622.4**	**1926.7**	**2112.7**	**2235.5**	**122.8**	**105.812**

Source: Customs statistics, NRA

By product groups, the analysis shows the following trends:

- 101.3 thousand tons of scrap (cast iron, iron and steel) were imported in 2017, there was a slight increase by ca. 7 thousand tons (107.2%) in comparison to 2016, but over the years the quantities were similar. Traditionally, they were imported from Romania and Serbia - in 2017 these countries imported 70 000 and 25 000 tons respectively, i.e. this was almost the total quantity the ferrous metals scrap.
- In 2017 imported were 367.6 thousand tons of **semi-finished products** – a decreased by ca. 115 thousand tons. The main importer was „Promet Steel“. The imports came mainly from Ukraine and the quantities are strongly dependent on the logistical capabilities and the situation in this country.

Figure 2.7



Import of scrap and semi–finished products, thousand tons

Figure 2.7 illustrates the trend in the import of scrap and semi-finished products used as raw materials in the metal industry. After processing they acquire a higher value added and are realized on the local market or exported.

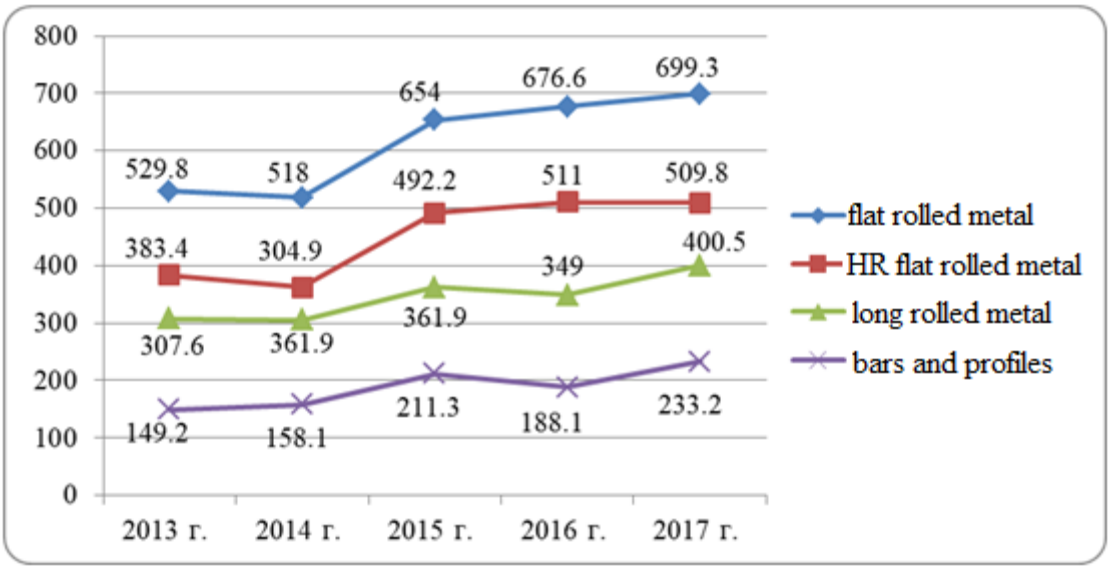
Figure 2.8 shows the total import of the two basic products – flat and long RFM **(HR and CR from alloyed and non-alloyed)**, and non-alloyed HR flat and long metals. Data about import show:

- In 2017 imported were 699.3 thousand tons total alloyed and non-alloyed flat HR metals and alloyed and non-alloyed CR metals - by 22.7 thousand tons more than in 2016. The imported non-alloyed HR

flat products were **509.8 thousand tons**; this is the largest good's group within the total import of non-ferrous metals, with a trend of an yearly growth. The main importer was Ukraine.

- In 2017 the imported long RFM incl.rolled wires were 400.5 thousand tons, by 51.5 thousand tons more than in the previous 2016 year. Imports of **non-alloy steel bars in 2017 only were 157.5 thousand tons** - an increase by 43.6 thousand tons compared to the previous year. The supply was realized mainly from Turkey and Greece. The imported non-alloy steel bars were 75.7 thousandth tons - by 1.5 thousand more than in 2016 with a trend of a moderate growth.

Figure 2.8

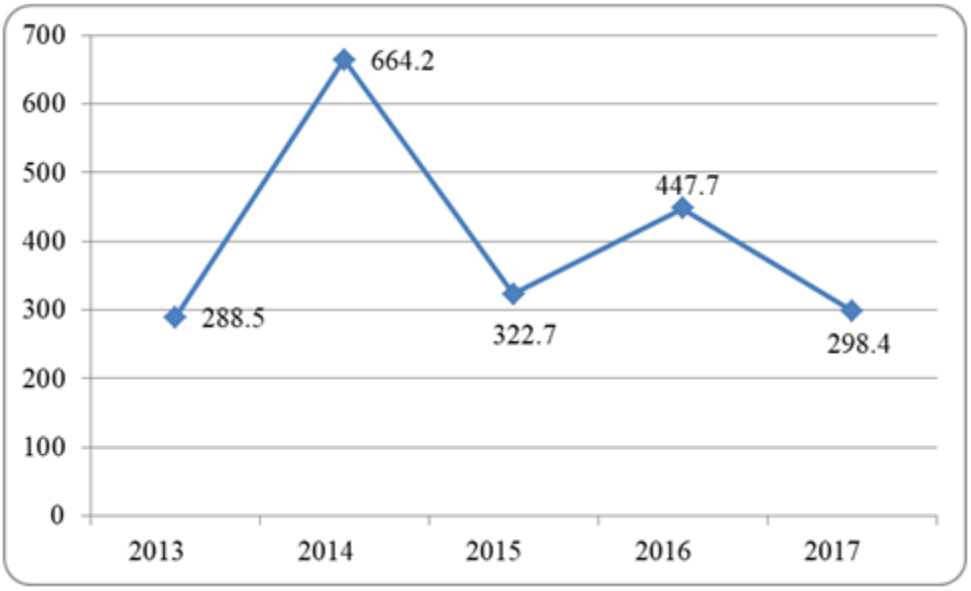


Import of flat and long rolled metal, thousand tons

The **total RFM products import** reached in 2017 **298.4.7 thousand tons** – a decrease by 149.3 thousand tons compared to 2016. Figure 2.9 illustrates the changes of the imports by goods groups over the last five years. Data bout groups show:

- A decrease of imported products (total) in 2017 due to **suspended deliveries of welded pipes** (-171 thousand tons) for the implementation of energy projects.
- The highest import show the coated sheets - 190.8 thousand tons - by 22.5 thousand tons more than in 2016 and with a trend for an increase in quantities. The demand is covered on by imports having the highest share of imported ferrous products (64 %).

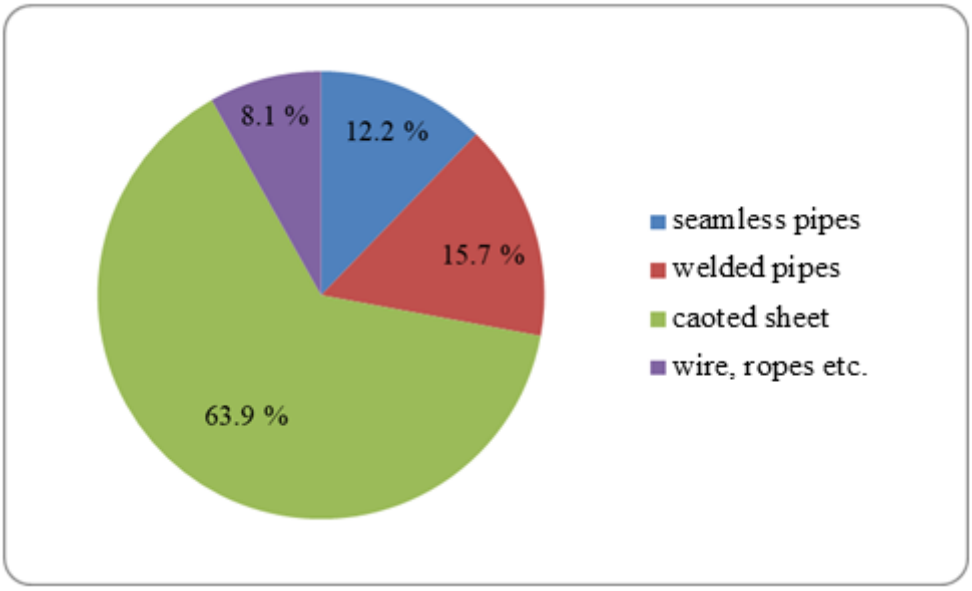
Figure 2.9



Import of RFM products, thousand tons

Figure 2.10 shows the structure of metal product's import in the last year.

Figure 2.10



Import of metal products by articles, thousand tons

In some years this ratio varies in favor of welded pipes when their import increases due to the implementation of natural gas transport and supply projects, and other energy gasification projects for the industry and households.

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 2016 appear on Table 2.4.

The export of metal products only (without scrap) in 2017 reached 1 338.8 thousand tons – by 267.4 thousand more compared to export in 2016 (1 071.4 thousand tons) or a growth by 124.9%. This increase was due to the exports of welded pipes imported into the country in 2014 for the implementation of energy and gas projects.

In 2017 the export of ferrous metals in terms of value reached BGN 1 802.2 million and was by BGN 865 million higher than in the previous year. This was due to the higher quantities of exported scrap, HR flat and pipes and on their assortment and prices as well.

Table 2.4

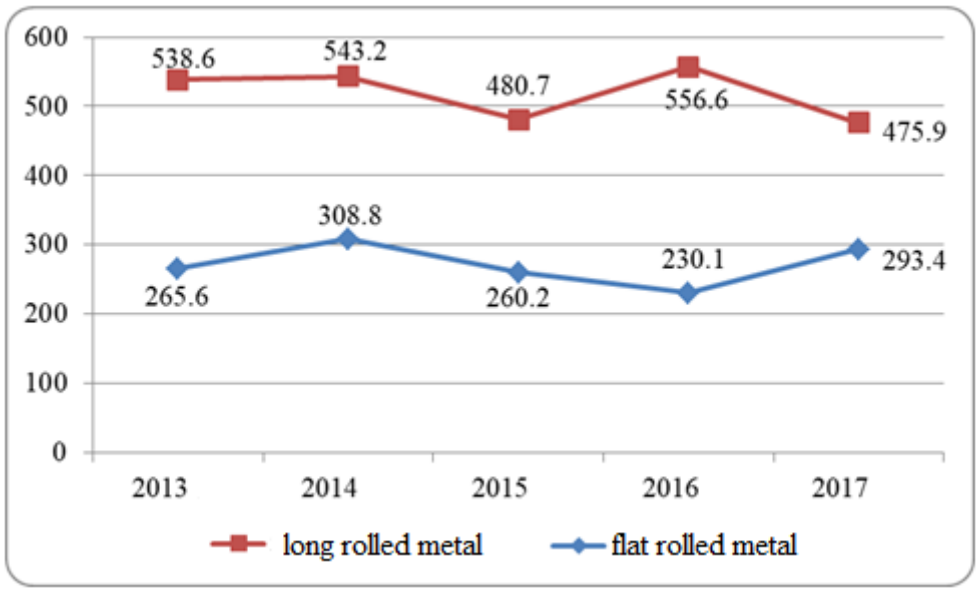
Export of ferrous metals and products, thousand tons

Articles:	2013	2014	2015	2016	2017	2017/16 +/-	2017/16 %
Non-alloyed - total	**1417.5**	**1224.4**	**937.5**	**1007.2**	**1123.9**	**116.7**	**111.6**
Pig iron-ingots, granules, powder	2.2	1.9	0.8	26.2	8.2	-18	31.3
Ferroalloys	3.9	4.3	2.4	1.3	1.8	0.5	138.5
Scrap	611	399	239.7	241	398.9	157.9	165.5
Semi- finished products	11.7	6.3	2.3	4.6	2	-2.6	43.5
HR metal (coils & sheets)	246.6	291.1	240.5	208.6	275.5	66.9	132.1
CR metal (coils & sheets)	16.9	14.9	16.9	17	12.7	-4.3	74.7
Rolled wire	49.8	39.3	27.5	15.7	9.3	-6.4	59.2
Bars	431	423.3	371.7	457.5	378.6	-78.9	82.8
Profiles	44.4	44.3	35.7	35.3	36.9	1.6	104.5
Alloyed - total	**15.5**	**39.1**	**48.6**	**52.6**	**56.3**	**3.7**	**107.0**
HR and CR coils and sheet	2.1	2.8	2.8	4.5	5.2	0.7	115.6
Bars and profiles	13.4	36.3	45.8	48.1	51.1	3	106.2
RFM products	**118.8**	**132.9**	**182.2**	**252.6**	**557.5**	**304.9**	**220.7**
Seamless pipes	2.7	2.8	1.8	2.5	3.1	0.6	124.0
Welded pipes	100.5	116	168.8	224.8	519.7	294.9	231.2
Coated sheets	7.6	7.5	6.2	11.4	13.6	2.2	119.3
Wires, ropes etc.	8	6.6	5.4	13.9	21.1	7.2	151.8
Total, thousand tons	**1551.8**	**1396.4**	**1168.3**	**1312.4**	**1737.7**	**425.3**	**132.4**
Value, EUR million	**668.5**	**622.7**	**503.6**	**527.3**	**1015.5**	**488.2**	**192.6**
Value, BGN million	**1307.5**	**1217.9**	**985**	**1031.2**	**1986.2**	**955**	**192.6**

Source: Customs statistics, NRA

The export of flat and long RFM is shown in Figure 2.11. Exported were 293.4 thousand tons flat RFM – by 63.3 thousand tons more than in the previous year. The main export's destinations of flat RFM in 2017 were Romania, Germany and Turkey.

Figure 2.11

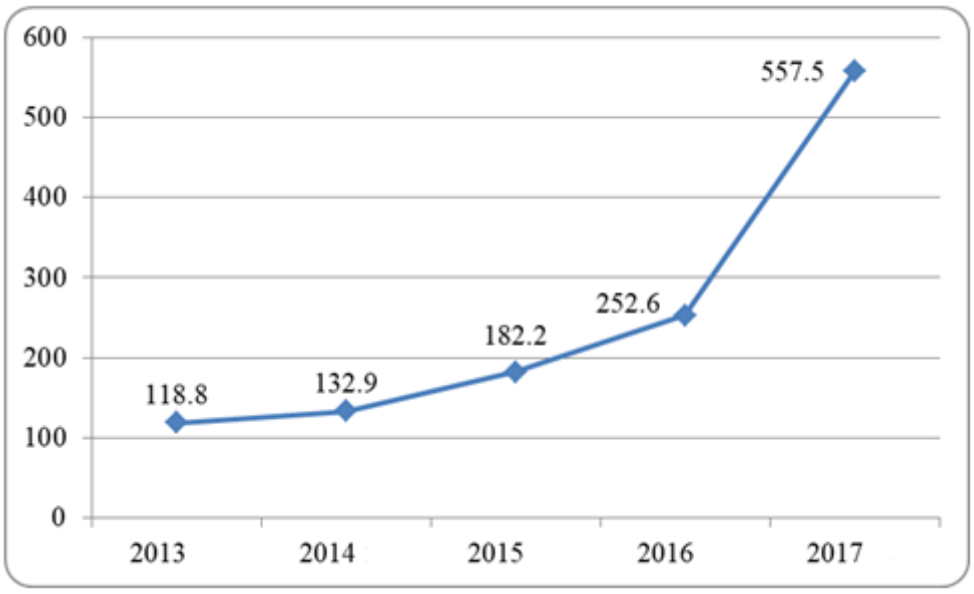


Export of flat and long RFM, thousand tons

In 2017 the export of **long HRM** - non-alloyed steel bars and profiles, was 419.6 thousand tons - by 77.3 thousand tons less than in the previous year. The export of **non-alloyed steel bars** (which are basic within the Bulgarian steel industry production) was 378.6 thousand tons - a decrease by 78.9 thousand tons compared to the previous year. The main quantities were exported to Romania – ca. 180 thousand tons.
The export of **non-alloyed steel profiles** remain on the same level as in 2016 - ca. 65 % of the export was for EU member states.
Data show an export of 51 thousand tons alloyed steel long rolled metals which are not produced in the country - with a possible third countries origin.

Data in Table 2.4 and Fig.2.12 for a five-years-period show a jump in the metal products's export, which in 2017 reached 557.5 thousand tons – over 90% of them were welded pipes, most of them not of Bulgarian origin.

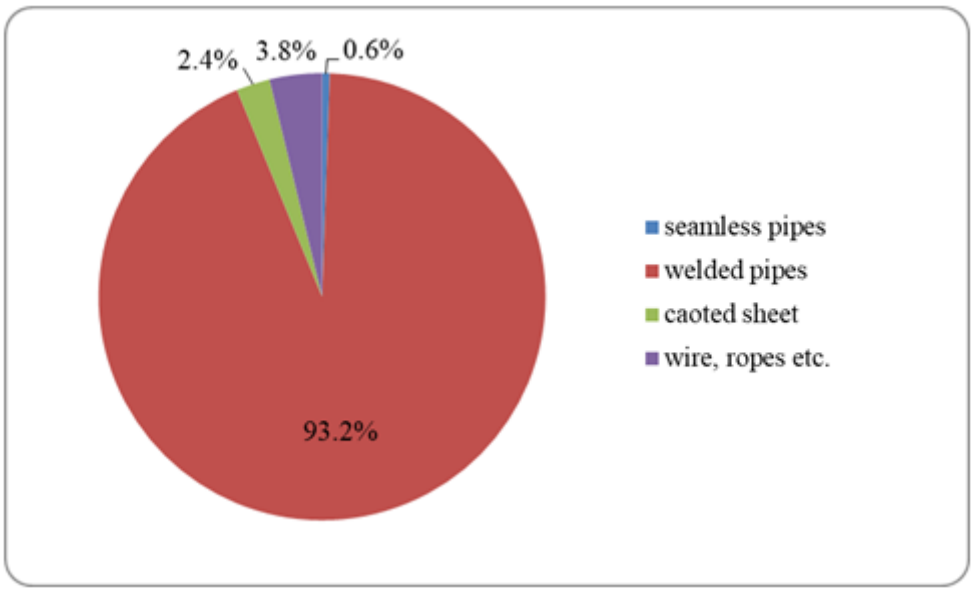
Figure 2.12



Export of metal products, thousand tons

The limited in assortment production of **RFM products** and the large quantity of pipes imported for the unrealized „South Stream“ gas pipeline project have changed the trade balance trends over the last years in the ferrous metals goods group. Welded pipes, supplied from other countries, show a major share of imports, and then of the exports in specific years.
Figure 2.13 illustrates the distribution of the goods group export in 2017 and the extremely high share of the welded pipes.

Figure 2.13



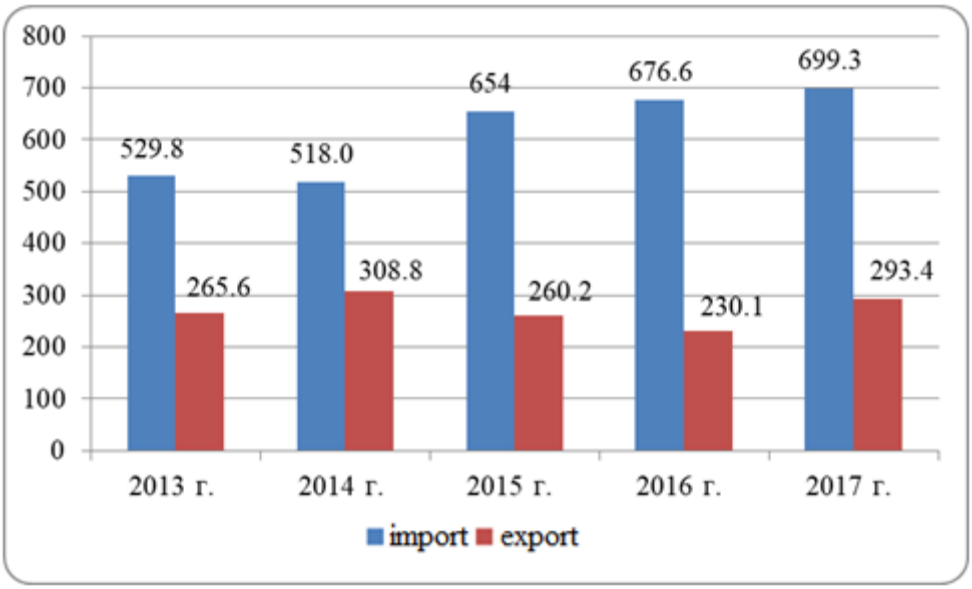
Export of metal products from RFM, 2017

2.2.3. FOREIGN TRADE TURNOVER 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 2013 – 2017 is presented in Figure 2.14. An almost constant increase show the import of ferrous metals, and in the export there are fluctuations without any clear trend. Over the period the import was significantly higher than the export and in 2017 the difference was ca. 2.5 times.

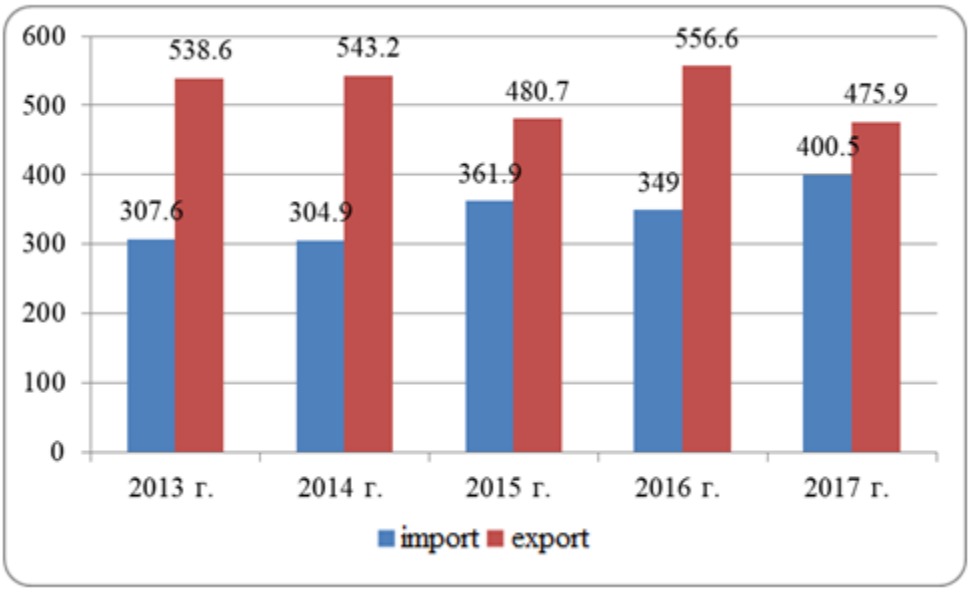
Figure 2.14



Import and export of flat RFM, thousand tons

By the **long RFM** (Figure 2.15) the situation is just the opposite – the export exceeded the import. In some years there was a higher growth in imports than in exports and so the positive balance was decreasing.

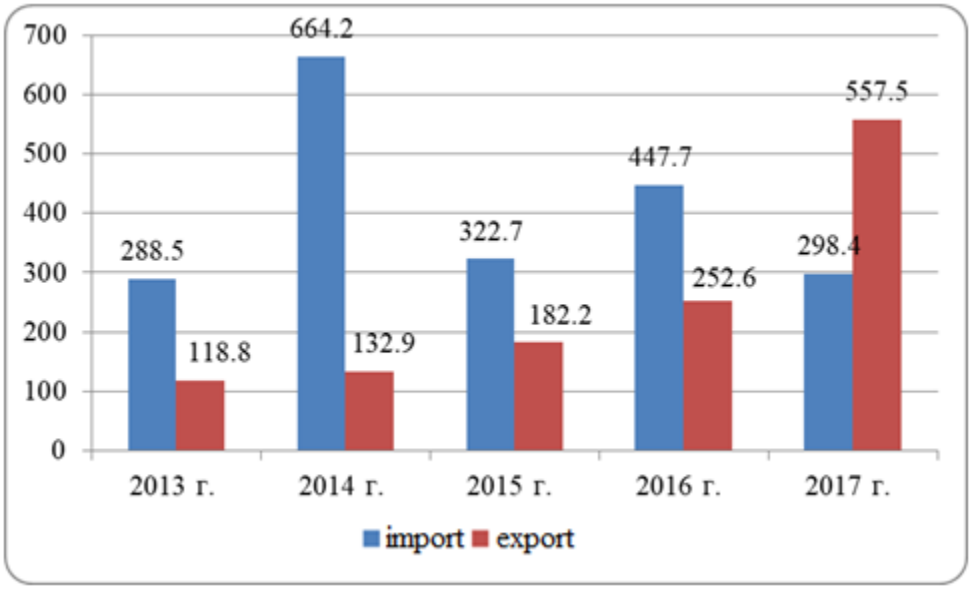
Figure 2.15



Import and export of long RFM, thousand tons

From the data on **imports and exports of RFM products**, presented in Fig. 2.16 a conclusion could be drawn that the trade balance was only positive in 2017. This change is due to the influence of the welded gas pipes, for which there is an explanation.

Figure 2.16



Import and export of RFM products, thousand tons

In 2017 the total quantity of exported ferrous metals products and articles incl. scrap exceeded the imported quantities by **139.4 thousand tons,** forming a positive trade balance**.**

Table 2.5

Foreign trade turnover of ferrous metal finished products in 2017

Production:	Export, thousand tons	Import, thousand tons	Difference
Semi-finished products	2.0	367.6	-365.6
Flat RM	293.4	699.3	-405.9
Long RM	475.9	400.5	75.4
Finished products	557.5	298.4	259.1
Scrap	398.9	101.3	297.6
Total:	1727.7	1867.1	-139.4

Source: Customs statistics, NRA

In 2017 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** – in 2017 the import also exceeded the export, respectively by 405.9 tons;
- **long RFM and scrap** - in 2017 the export was higher than the import, respectively by 75.4 thousand tons and 297.6 thousand tons;
- **RFM products** – the group reported a positive balance of 359.1 thousand tons only due the pick in the welded pipes export.

Eliminating the numbers about scrap and taking into account the foreign trade with finished metallurgical products, the export reached 1 328.8 thousand tons and the import - 1 765.8 thousand tons, forming a negative foreign trade balance of 437 thousand tons. This indicator is changing over the years - in 2015 it was 586 thousand tons and in 2016 it reached 911.8 thousand tons.
In Table 2.6. data are presented on the foreign trade turnover (in terms of nature) only of **rolled ferrous metals** – eliminated are the numbers about cast iron, ferroalloys and scrap.

In 2017 the total turnover of **rolled ferrous metals**, incl. semi-finished products, came to 1 868 thousand tons - by 431.3 thousand tons less than in 2016. This decrease is due to decreased imports - by 409 thousand tons and to decreased exports - by 22.3 thousand tons. Both factors lead to a decrease of the negative balance by 330 thousand tons – by ca. 50%.

The turnover of **RFM products** in 2017 reached 855.9 thousand tons. Over the mentioned period this goods group show a decreased import and a very high export growth, resulting in a positive trade balance of 259.1 thousand tons - for the first time over the last five years.

Table 2.6

Foreign trade turnover of RFM and finished products, thousand tons

Products and articles of RFM	2013	2014	2015	2016	2017	2017/16 +/-	2017/16 %
Rolled ferrous metals							
- import (incl. semis)	1250	1161.3	1388.7	1508	1099	-409	72.9
- export (incl. semis)	815.9	858.3	743.2	791.3	769	-22.3	97.2
Total turnover	**2065.9**	**2019.6**	**2131.9**	**2299.3**	**1868**	**-431.3**	**81.2**
Balance (export-import)	**-434.1**	**-303**	**-645.5**	**-716.7**	**-330**	**386.7**	**46.0**
RFM products							
- import	288.5	664.2	322.7	447.7	298.4	-149.3	66.7
- export	118.8	132.9	182.2	252.6	557.5	304.9	220.7
Total turnover	**407.3**	**797.1**	**504.9**	**700.3**	**855.9**	**155.6**	**122.2**
Balance (export-import)	**-169.7**	**-531.3**	**-140.5**	**-195.1**	**259.1**	**454.2**	**-132.8**

Source: Customs statistics, NRA

The positive balance by the finished products is not a result of the Bulgarian metallurgy's activity – it is due to re-export.

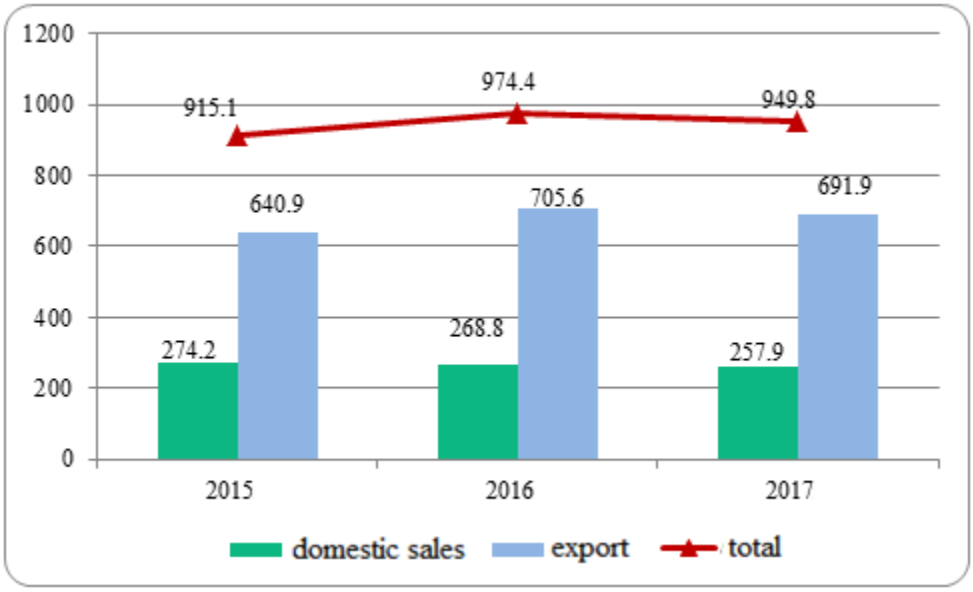
2.2.4. DOMESTIC SALES OF RFM AND FINISHED PRODUCTS

In this chapter data are given about the total realization of the metallurgical production in the country and about some articles in terms of quantities. These indicators are relevant for determining the actual domestic consumption for the relevant period.

In 2017, total sales on the **domestic market** reached 257.9 thousand tons, with a slight decrease trend over the last three years - by about 10 thousand tons per year.

Exports show a reverse trend – an increase in 2016 and 2017 - by 60 thousand tons and 50 thousand tons respectively, compared to 2015 (Figure 2.17).

Figure 2.17



Realization of RFMand their products, 2015-2017

Table 2.7 shows the total realization of flat and long RM in 2017 – compared to 2016 it decreased by 3.1 %. The home consumption of long products is decreasing while the same indicator by the flat products shows an increase. The export of flat HR products is changing significantly and is demonstrating a growth by 154 %.

Table 2.7

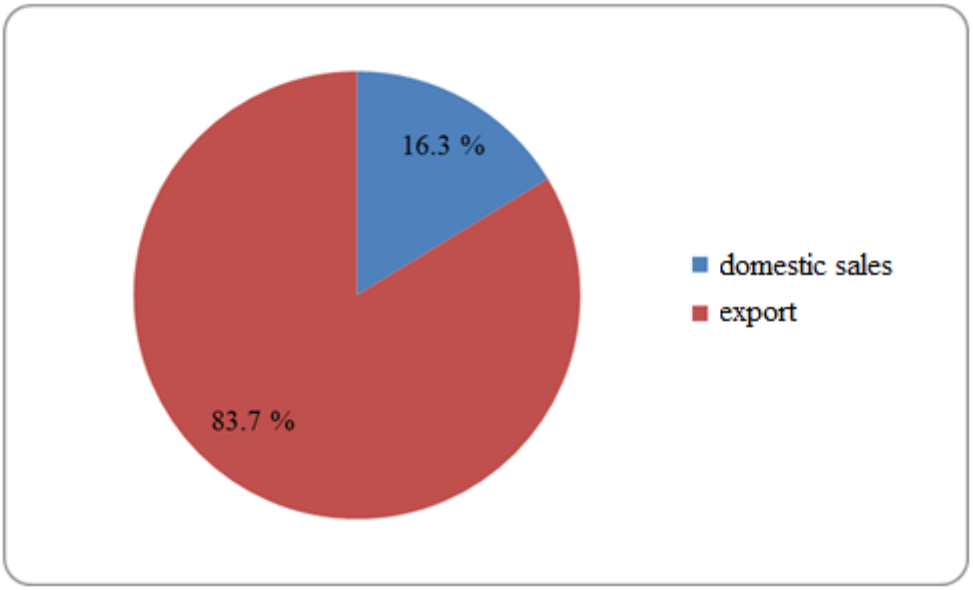
Realization of RFM production

Production	Export		Domestic market		Total realization	
	2016	2017	2016	2017	2016	2017
Long RFM	494.3	411.0	200.1	180.4	694.4	591.4
Flat RFM	157.1	241.9	23.0	32.6	180.1	274.5
RFM total	***651.4***	***652.9***	***223.1***	***213.0***	***874.5***	***865.9***

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 for these goods, 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 2017, the ratio of exports/realization on domestic market for the basic metallurgical products - flat and long rolled products is 75.4%/24.6%.** These exports contribute to the high indicators in the export of metallurgical production (Figure 2.18).

Figure 2.18



Realization of RFM products, 2017

2.2.5. REAL HOME CONSUMPTION (RHC) OF STEEL PRODUCTS

The consumption of steel and steel products is an important indicator of the status of the industry and of its development potential.

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 2016 and 2017 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. As already mentioned in this publication, data on the import of articles in the welded pipes section distorts the picture and the actual consumption as well. In previous years the imported large quantities of gas pipelines were not invested in the economy and the RHC is unreasonably high. In 2017 this factor is not acting and the RHC is credible.

In 2017 the RHC of steel products was 1 656.1 thousand tons - a decrease by 86 thousand tons is registered compared to the previous year, due to the above mentioned reasons.

Table 2.8

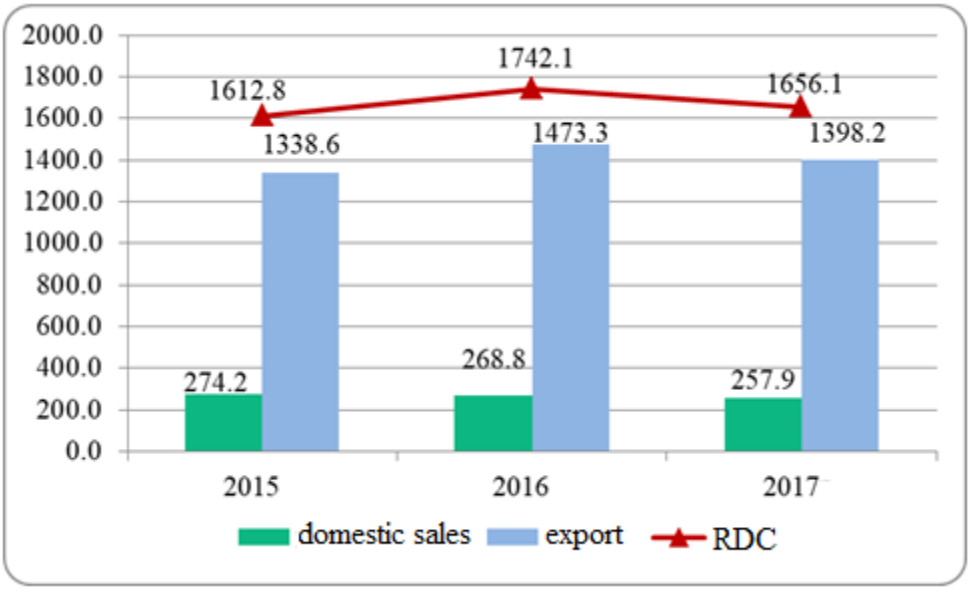
Real home consumption (RHC) of steel products, thousand tons

Products:	2016			2017			2017/2016	
	Home sales	Import	**RHC**	Home sales	Import	**RHC**	Difference	%
Long RFM	200.1	349	549.1	180.4	400.5	580.9	31.8	105.8
Flat RFM	23	676.6	699.6	32.6	699.3	731.9	32.3	104.6
Total RFM	***223.1***	***1025.6***	***1248.7***	***213***	***1099.8***	***1312.8***	***64.1***	***105.1***
Products of RFM	45.7	447.7	493.4	44.9	298.4	343.3	-150.1	69.6
Total	**268.8**	**1473.3**	**1742.1**	**257.9**	**1398.2**	***1656.1***	***-86***	***95.1***

Source: Customs statistics and NRA (import),
Company data (domestic realization)

If the numbers about products (mainly pipes) are eliminated, the **RHC of the main steel products is increasing compared to 2016 by 31.8 thousand tons for the flat RM and by 32.3 thousand tons for the long RM.**

Figure 2.19



Real home consumption, 2015-2017

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

AC = (M + I) – E, 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 2016 the apparent consumption (AC) of steel products in Bulgaria was 1 018 thousand tons - compared to 2016 the AC is decreasing by 439.2 thousand tons. This decrease by ca. 39% is not real – it is once again due to the both factors -import of pipes in previous years and a high export of the same in 2017.

Table 2.9

Apparent consumption of steel products, thousand tons

Year	Production	Import	Export	AC	APCC
2012	895.1	1028.8	951.8	972.1	133.5
2013	945.1	1125.9	923.0	1148.0	157.6
2014	1016.2	1487.1	984.9	1518.4	210.8
2015	953.5	1338.6	923.1	1369.0	191.4
2016	1023.2	1473.3	1039.3	1457.2	205.2
2017	**946.6**	**1398.2**	**1326.8**	**1018**	**144.4**

Source: Company data (production), Customs data (import and export)

The apparent per capita consumption (APCC) is another interesting indicator.
In 2017 the APCC in EU(28) was 318.9 kg per capita - compared to 2016 it is increasing by 2.3 %.
The APCC in Bulgaria was 144.4 kg per capita – ca. 45% of the average for the EU.
The countries with the highest APCC in the world in 2017 were:

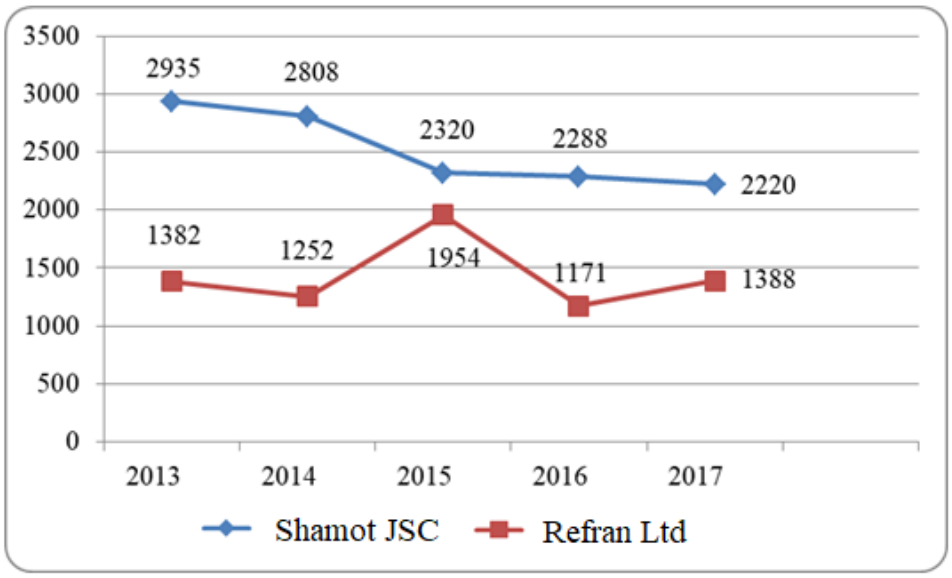
- South Korea – 1 106.3 kg/capita
- Taiwan (China) – 747.1 kg/capita
- Czech Republic – 663.3 kg/capita
- China – 522.8 kg/capita
- Germany – 508.5 kg/capita
- Japan – 505.5 kg/capita
- Austria – 460.8 kg/capita

The real home consumption (RHC) and the apparent consumption (AC) of steel show close but different values. This is due to the influence of different factors such as stocks by producers and consumers, re-exports etc. But both indicators show the same downward trend or a consumption growth.
In 2017 the world steel consumption reached 1 587.4 million tons - by 71.4 million tonnes more than in 2016 or a growth by 104.5%. Over the same period, the EU consumption was 162.3 thousand tonnes – an increase by 3.9 million tonnes (102.4%). The growth rate in the EU is lower than in the world average.

2.3. PRODUCTION AND CONSUMPTION OF REFRACTORY ARTICLES AND MATERIALS

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 the furnaces and aggregates for casting, storing and spilling of the 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

Refractory products answering to specific requirements and with high temperature characteristics are not produced in the country so they are provided by imports.

The total quantity of refractory materials produced in 2017 by both enterprises increased by 149 tons (4.3%). The production of „Shamot EL PE 2007" Ltd. remained close to the level in the previous year, while this of „Refran" Ltd increased by 218 tons (18.5%) due to larger portfolio and increased number of employees. The company is specializing in the production of high technology refractory materials with higher value added for which it is a benefiter of EU Operative Programs „Human Resources Development" and „Innovation and Competitiveness". The total value of the projects is about BGN 350 thousand; the implementation is foreseen in the period 2017 - 2018.

The refractory materials produced by companies BAMI-members are mainly realized on the domestic market.

2.4. METAL CASTING

According to the national classification of economic activities (NCEA 25.5) casting of ferrous and non-ferrous metals and their alloys belongs to the general sector 24. Production of basic metals. Metallurgy and metal casting have common characteristics regarding the technologies, processes and equipment used, and determine common problems, tasks and objectives of the enterprises and so bringing their activities into one unified code of the standard classification. Therefore, they are grouped together in a standard national, EU and world classification. In addition, businesses have identical problems, tasks and objectives, and uniform legislation applies to them.
Due to the inherited economic structure, part of the metal casting companies in the country are defined as an activity of general mechanical engineering. Their accession in BAMI is a constant task and a prerequisite to improving the overall coverage of the sector by this yearbook, complying with EU criteria and common performance indicators.
In the country there are capacities for metal castings exceeding the domestic demand. The companies are producing both for the domestic market and for export. They are producing parts for equipment, connecting elements etc. providing spare parts in the form of castings or machined parts for different sectors of the economy and for households.

BAMI-members reporting under NCEA 24.5. Metal casting are: „Berg Montana Fittingi“ PJSC, „BMB Metal“ Ltd, „Casting, Forging Mashinery Complex“ Ltd., „Chugunoleene - Parvomay“ AD and „GES Trading“ Ltd.
„Berg Montana Fittingi“ PJSC is specialized in the production of fittings for export in EU member states;
„IPO“ Ltd. - in the town of Karlovo is producing single, small and middle-sized series of ferrous and non-ferrous metal parts with primary treatment or complete machining. Good quality is the basis for the achieving a high growth in the production which is mainly realized on the local market. The company is performing repair activities in companies from the basic industries incl. Metallurgy;
„BMB Metal“ Ltd. is organizing and managing the production of castings coming from the pig iron cast factory in the town of Ihtiman and the „Cast and forge machine-building complex“ in Radomir. The companies are restructuring their production and updating the technologies and equipment.

NSI data about activity **24. Production of basic metals** include indices about the ferrous metallurgy (24.1, 24.2 and 24.3), about the non-ferrous metallurgy (24.4) and **24.5.Metal casting.**

The general indicators for the metallurgical sector – NCEA 24 and their values for 24.5 Metal casting only for two consecutive years are presented in Table. 2.10.

Table 2.10

Indicator	2015	2016	Difference, %
Output produced, BGN million			
- total for NCEA 24	7 412	6 779	*92*
incl. ***24.5 Metal casting***	***193***	***217***	***112***
Value added, BGN million			
- o total for NCEA 24	677	846	125
в incl. ***24.5 Metal casting***	***62***	***79***	***128***
Value added per employee, BGN thousand			
- total for NCEA 24	57	66	116
incl. ***24.5 Metal casting***	***17***	***22***	***129***
Employer's labor costs for 1 working hour			
- total for NCEA 24	10.78	11.51	107
incl. ***24.5 Metal casting***	***6.61***	***5.42***	***112***
Total employed in 24.5 Metal casting	**3694**	**3698**	

The Table shows that metal casting performance compared to these for metallurgy has lower values but with a clear trend to grow significantly above the sector averages. The specific nature of the processes and production in the different metallurgical industries does not imply the alignment of these indicators, but the changes in metal casting are very positive and the growth rate is evidence for their development.

The number of employees in the sector has not changed for several years, the number of employees under labor contract is ca. 3 700. In 2016, **the average wage increased by 112%** reaching BGN 827/month, but was slightly below the average in the processing industry (BGN 846/month).

According to the latest Eurostat (NSI) data for **2016,** the production of metal casting in the EU (28) was worth EUR 36.6 billion - a 12% share of the total basic metal production (EUR 310 billion), with an annual decrease by 4 %. In Bulgaria, this share was 3% (EUR 109 million), but with **an increase by 112%, compared to the previous year.**

SECTION THREE

NON-FERROUS METALLURGY IN BULGARIA

3.1. PRODUCTION OF NON-FERROUS METALS

The non-ferrous metallurgy is an important sector of the Bulgarian processing industry and the metallurgical enterprises have good positions in the EU ranking of the copper, zinc and lead producers.
The year 2017 was characterized by sustainable production and significant growth in the export of basic non-ferrous metals and metal products.

3.1.1. PRODUCTION OF COPPER (ANODIC AND ELECTROLYTIC)

Anodic/electrolytic copper in Bulgaria is produced only by „Aurubis Bulgaria“ JSC. The company is member of the industrial group Aurubis AG – the largest cathodes producer in Europe and world leader in the copper processing.

The main production activity of „Aurubis Bulgaria“ JSC covers the processing of copper concentrates and metal waste to anodic and electrolytic copper, and other by-products (sulfuric acid, sludge containing precious metals and fayalite).
The copper plant in Bulgaria was built in 1958 and consists of four main production units: metallurgical production, cathode copper refinery, production of sulfuric acid and enrichment plant.
For the period 1997 (when the company privatization started) till the end of 2017, more than EUR 1.1 milliard are invested for the modernization of the production and for protection of the environment.
The implementation of the planned investment program "Aurubis Bulgaria Spectrum 2018" worth EUR 180 million continued in 2017.
Significant funds (over EUR 22 million) were invested in the construction of: reserve anode furnace, equipment for improving the efficiency of the sulfur gases treatment system and the production of sulfuric acid, modernization of the company’s energy transmission and distribution system, concentrates storage and loading facilities on Port Bourgas etc. The implementation of a project for the slag cooling in buckets started aiming an improvement of the working environment and the flotation process.
In 2017the construction of a new fayalite depot was completed.
Data about the processed in the production of anodic and electrolytic copper concentrates and scrap for the period 2013 – 2017 are shown in Table 3.1 and Fig 3.1.

Table 3.1

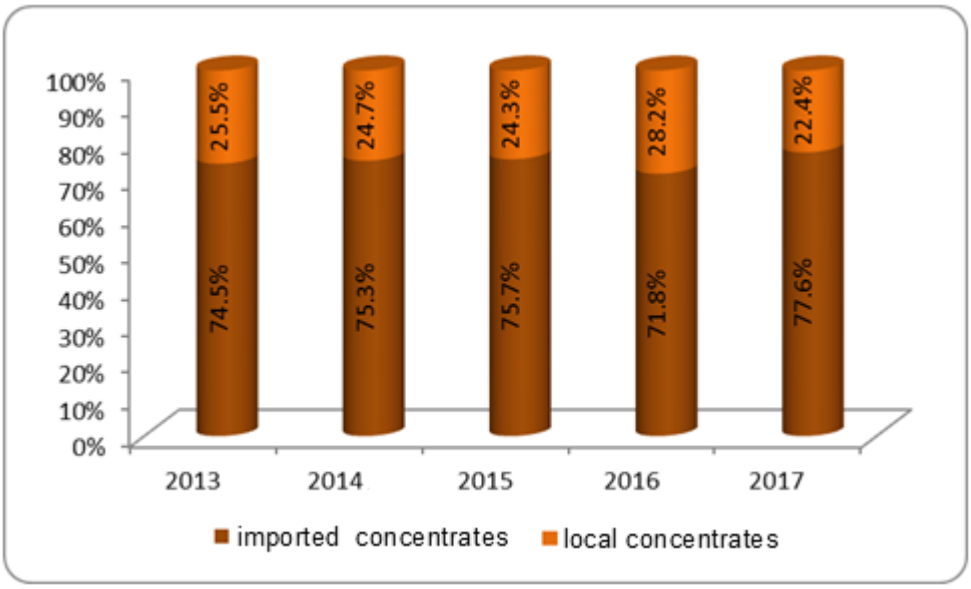
Raw materials processed in the production of anodic and electrolytic copper

Product	2013	2014	2015	2016	2017	Difference 2017/2016	
						+/-	%
Concentrates, tons	**1 227 926**	**1 165 484**	**1 203 248**	**1 055 636**	**1 357 144**	**301 508**	**128.6**
- copper contents,%	24.06	25.20	24.57	23.69	24.00	0.31	101.3
- metal contents, tons	**295 435**	**293 718**	**295 690**	**250 080**	**325 754**	**75 674**	**130.3**
Incl. in imported	220 128	221 299	223 942	179 507	252 751	73 244	140.8
in local	75 307	72 419	71 748	70 573	73 003	2 430	103.4
Scrap (purchased), tons	**60 320**	**62 280**	**56 168**	**51 768**	**52 507**	**739**	**101.4**

Source: Company data

1 357 144 tons of copper concentrate were processed in 2017 – by 28.6 % more than in 2016; they contain 325 754 t copper. In Figure 3.1 the percentage of the imported and the local concentrates in 2017 is shown - the ratio is 4: 1 in favor of the import. Compared to the previous year the relative share of the imported concentrates is growing by 5.8 %.

Figure 3.1



Processed concentrates, tons of metal

It is the company's policy to increase the quantities of processed copper scrap which in 2017 represents 13.9% of the copper in the raw materials.

The production of anodic and electrolytic copper for the period 2013-2017 is presented in Table 3.2 and Fig. 3.2.

Table 3.2

Production of anodic and electrolytic copper, tons

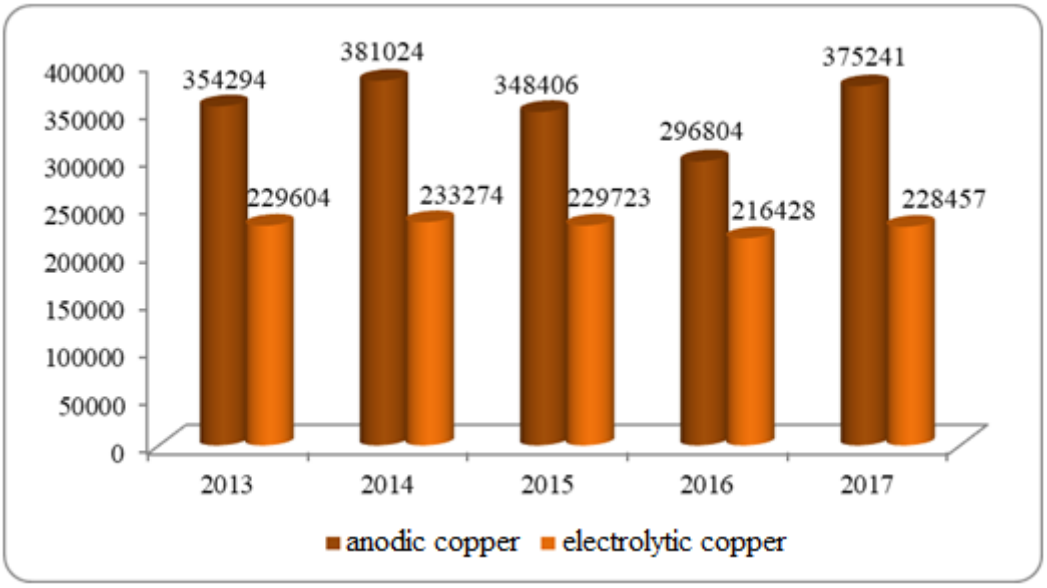
Product	2013	2014	2015	2016	2017	Difference 2017/2016	
						+/-	%
Anodic copper	354 294	381 024	348 406	296 804	375 241	78 437	126.4
Electrolytic copper	229 604	233 274	229 723	216 428	228 457	12 029	105.6

Source:Company data

As a result of a large scale renovation of the major metallurgical capacities in 2017, larger quantities of copper concentrates and copper scrap were processed. The production of anodic copper is growing by 26.4% and of electrolytic copper - by 5.6%.

By the utilization of the sulfur contained in the concentrates, 1 394 969 t sulfuric acid was produced - by 26.7% more than 2016.

Figure 3.2



Production of anodic and electrolytic copper in 2017, tons

The world production of refined copper in 2017 is also growing but only by 0.6% reaching 23.5 million tons. The produced quantities by regions are presented in Table 3.3 and Fig. 3.3.

Table 3.3

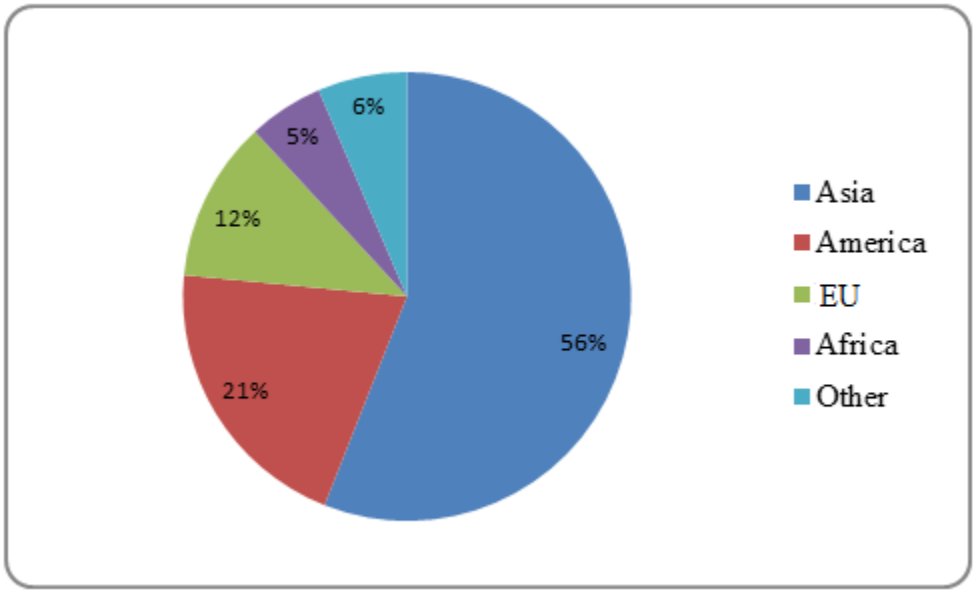
World production of electrolytic copper, thousand tons

Region	2015	2016	2017	Difference 2017/2016	
				+/-	%
Asia	12 004	12 703	13 166	463	103.6
America	5 217	5 214	4 821	-399	92.5
Europe	3 757	3 714	3 853	139	103.7
incl. EU-28	2 731	2 674	2 730	56	102.1
Africa	1 382	1 257	1 274	17	101.4
Others	510	475	394	-81	82.9
Total	**22 870**	**23 363**	**23 508**	**145**	**100.6**

Source: ICSG

Data show that Asia continues to have the largest relative share of the world production (56%) and a growth by 3.7% (5.6% in 2016). America is following with a share of 21%, but with a decline of 7.5%. **Europe ranks third with a share of 16.4% and an increase of 3.7%.** Only in the **EU** the production in 2017 is increasing by 2.1% and represents **12% of the world production of refined copper**.

Figure 3.3



World production of electrolytic copper (by regions), 2017, %

The **electrolytic copper** produced in Bulgaria in 2017 represents 0.97% of the world extraction and **8.37% of that in the EU (28).** In 2016 these share were 0.93% and 8.01%, respectively. The quantities of **anodic copper** produced are larger - 1.96% of the world and 16.5% of the EU production.

3.1.2. LEAD PRODUCTION

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

„KCM" JSC is the only enterprise in the country and a leading company in Southeastern Europe and the Black Sea region with a specialization in the production of lead and zinc mainly from primary raw materials. The company is part of „KCM 2000" JSC, one of the biggest industrial groups in Bulgaria.

In order to maintain its leadership position, the company continually invests in projects to improve energy efficiency, quality, ecology, working environment and to implement innovations.

In 2017 the indicators of the new lead production plant were improved. New investments amounting BGN 20 075 thousand were realized in:

- Activated cleanser of cobalt and nickel;
- Replacement of cooling cylinder ADE 510;
- Gasification and combustion furnace in Refinery;
- Construction of „Dry Cleaning" installation in the New Lead Production 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

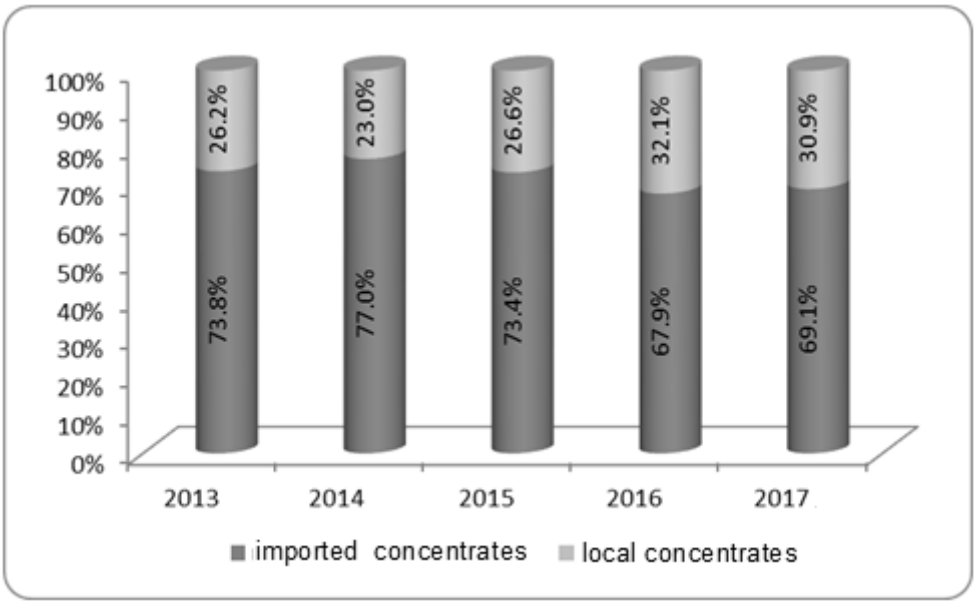
Processed raw materials in the production of lead, tons

Product	2013	2014	2015	2016	2017	Difference 2017/2016	
						+/-	%
Metal in concentrates	**60 917**	**67 190**	**61 908**	**61 358**	**52 149**	**-9 209**	**85.0**
incl.: in imported	44 931	51 729	45 452	41 670	36 050	-5 620	86.5
in local	15 986	15 461	16 456	19 688	16 099	-3 589	81.8
Processed waste (imported)	**12 341**	**11 824**	**20 604**	**11 235**	**15 849**	**4 614**	**141.1**

Source: Company data

In 2017 the quantity of processed primary raw materials (concentrates) are decreasing in favor of the increased share of wastes. The local concentrates are about 30% of the total raw materials; the ratio is presented in Fig.3.4.

Figure 3.4



Processed concentrates, tons of metal

The new lead plant allows the processing of larger quantities of non-standard lead raw materials, semi-finished products and wastes. The wastes processed in 2017 **were by 4 614 tons more** than these in the previous year and **represented 23.3%** of the lead raw materials (15.5% in 2016).
Wastes, incl. from batteries are processed to lead and lead alloys by „Monbat Recycling“ PJSC and „EL BAT“ JSC as well.

„Monbat Recycling“ PJSC is the main producer of lead battery alloys in the country, these are used within the end production – led batteries.

In „EL BAT“ JSC a new installation was put into operation and so the production capacity was tripled.

Resulting from this policy of the metallurgical companies, the share of the processed wastes is increasing constantly and the quantity of these raw materials is securing more than 40% of the lead produced in the country.

Data about the total production of lead incl. battery alloys for the period 2013 – 2017 are presented in Table 3.5 and Fig. 3.5.

Table 3.5

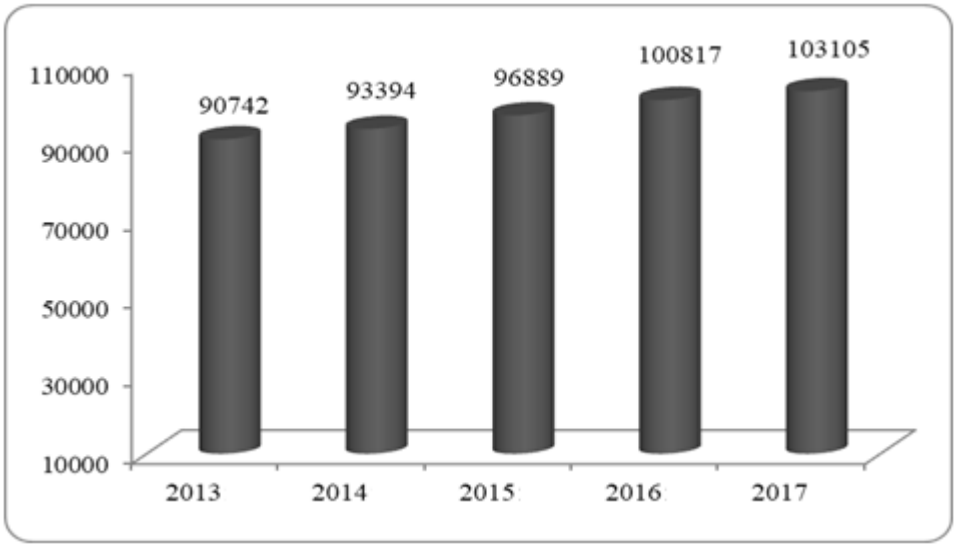
Production of lead, tons

Product	2013	2014	2015	2016	2017	Difference 2017/2016	
						+/-	%
Lead - primary	**71 668**	**73 064**	**70 252**	**69 256**	**71 653**	**2 397**	**103.5**
- „KCM“JSC	71 668	73 064	70 252	69 256	71 653	2 397	103.5
Lead - secondary	**19 074**	**20 330**	**26 637**	**31 561**	**31 452**	**-109**	**99.7**
„Monbat Recycling“PJSC	14 904	15 530	16 231	16 581	16 502	-79	99.5
„El Bat“ JSC	4 170	4 800	10 406	14 980	14 950	-30	99.8
Lead - total	**90742**	**93394**	**96889**	**100817**	**103105**	**2 288**	**102.3**

Source: Company data.

In 2017 the total quantity of produced lead (primary and secondary) is coming to 103 105 tons with an increase by 2.3%, and mainly due to the increased production of „KCM“ JSC.

Figure 3.5



Production of lead in 2017- 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 production of lead, thousand tons

Country/Region	2015	2016	2017	Difference 2017/2016	
				+/-	%
Asia	**6 672**	**6 901**	**7 032**	**131**	**101.9**
- incl China	4 700	4 665	4 716	51	101.1
- incl. Republic of Korea	641	831	820	-11	98.7
America	**2 002**	**2 076**	**1 976**	**-100**	**95.2**
- incl. USA	1 050	1 123	1 006	-117	89.6
EU(28)	**1 798**	**1 757**	**1 804**	**47**	**102.7**
-incl. Germany	378	339	354	15	104.4
Others	**500**	**508**	**408**	**-100**	80.3
Total	**10 972**	**11 242**	**11 320**	**78**	**100.7**

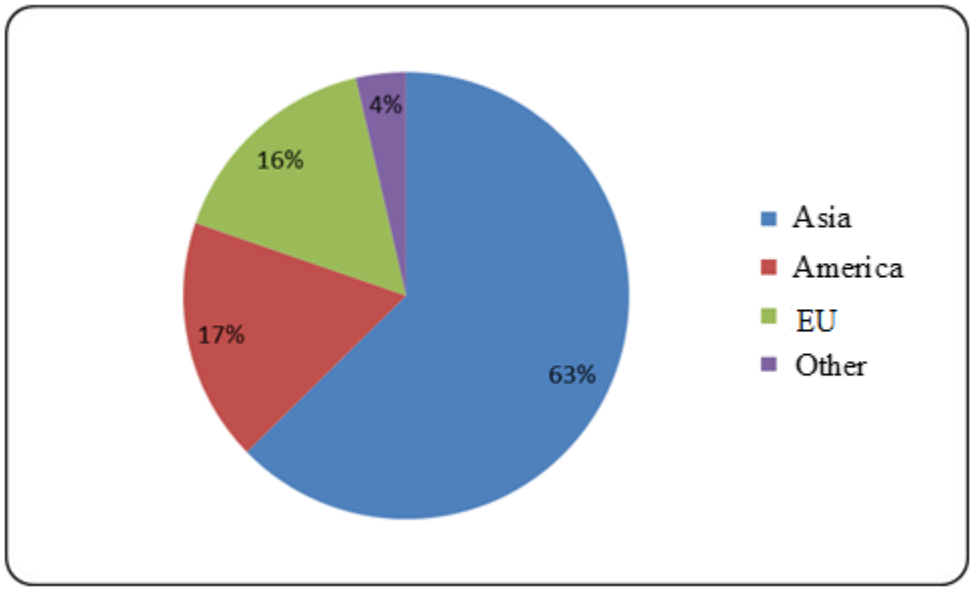
Source:ILZSG

Asia has the biggest relative share of the world production (63%), which presents a growth by 1.9%. This growth is due to the increased production in China – the biggest producer of lead in the whole world. For 2017 America is accounting for 4.8% decrease of the production mainly due to the USA decline by 10.6%. Accordingly, the region's share dropped from 18.6% in 2016 to 17%.

The EU (28) occupied the third place in the world lead production with a share of 16 % and a growth by 2.7% compare to the previous year.

Traditionally Germany is the biggest producer within the EU (28) with a share of 19.6 %. In comparison to 2016 the production in the country is growing by 4.4%. The UK occupies the second position with share of 17.6 %, Italy has a share of 10.4 %.

Figure 3.6



World lead production by regions, 2017, %

The total quantity of lead produced in Bulgaria in 2017 represents 0.91% of the world production and **5.72% of the EU(28) production**.

By volume, the lead produced in **Bulgaria ranks seventh from the EU (28) producer countries.**

3.1.3. PRODUCTION OF ZINC

„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, and bisulfate, gold and silver) are obtained.
The 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 and Figure 3.7.

Table 3.7

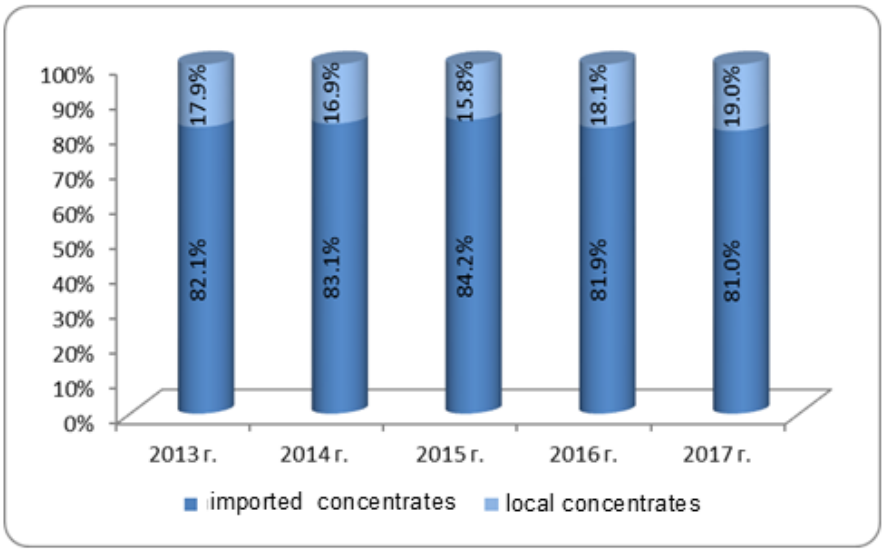
Processed raw materials for the production of zinc, in tons

Product	**2013**	**2014**	**2015**	**2016**	**2017**	**Difference 2017/2016**	
						+/-	**%**
Metal in concentrates, incl.:	**66 894**	**66 685**	**68 043**	**63 011**	**57 307**	**-5 704**	**91.0**
- import	54 902	55 386	57 260	51 596	46 421	-5 175	**90.0**
- local	11 992	11 299	10 783	11 415	10 886	-529	**95.4**
Processed imported scrap	**11 363**	**13 193**	**11 983**	**16 802**	**16 226**	**-576**	**96.6**

Source:Company data

In 2017 concentrates were processed which contained 57 307 tons of zinc – by 5 704 tons less (9%) than in the previous year, the quantity of the processed secondary raw materials remains the same. Zinc in local concentrates represents 19% of the total amount of metal in the concentrates used - in the recent years this ratio is the same.

Figure 3.7



Processed concentrates, in tons of metal

Data about the zinc production in the last five years are shown in Table 3.8 and Figure 3.8.

Table 3.8

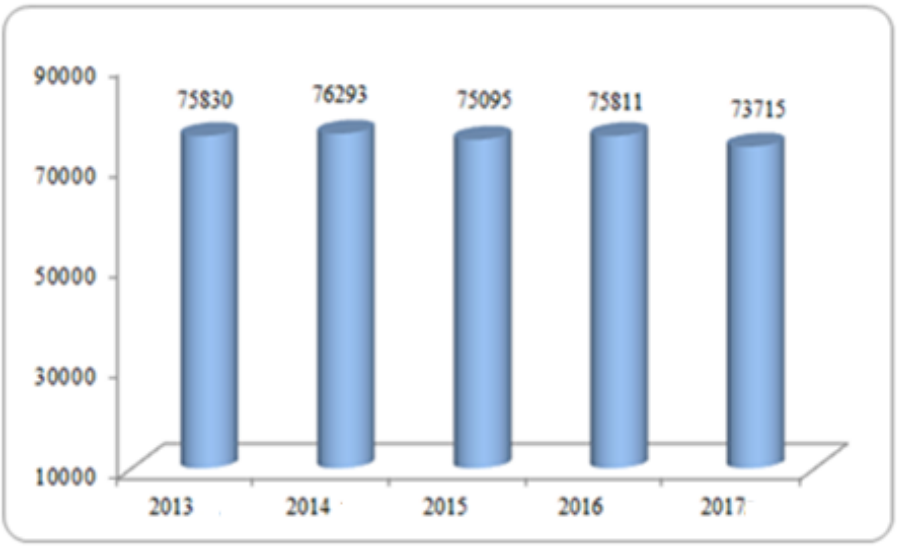
Production of zinc, tons

Product	2013	2014	2015	2016	2017	Difference 2017/2016	
						+/-	%
Zinc - total	**75 830**	**76 293**	**75 095**	**75 811**	**73 715**	**-2 096**	**97.2**

Source:Company data

In 2017 were produced 73 715 tons zinc - by 2 096 tons less than in the previous year.

Figure 3.8



Production of zinc in 2017, tons

Table 3.9 and Figure 3.9 show the world production of zinc by regions, the main producer countries, their relative share and growth/decline in comparison to the previous year.

Table 3.9

World zinc production, thousand tons

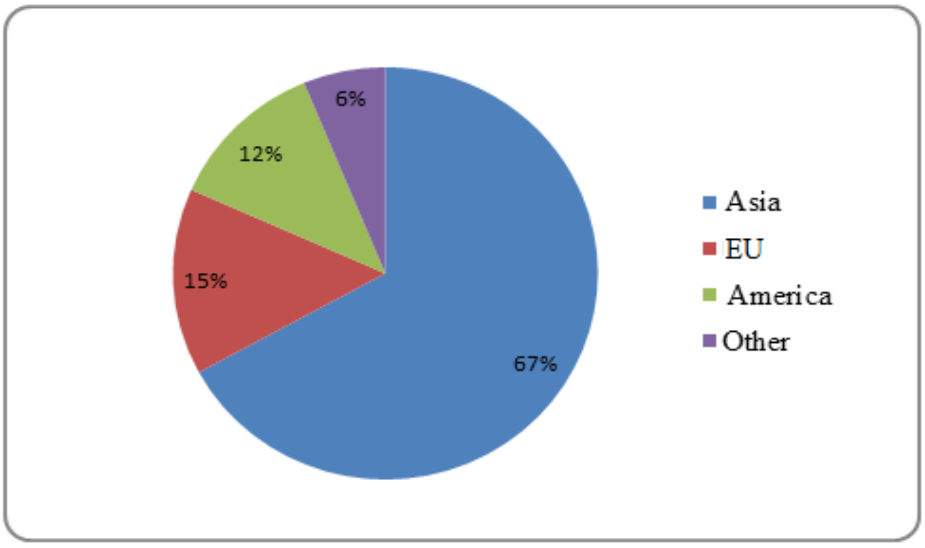
Country/Region	2015	2016	2017	Difference 2017/2016	
				+/-	%
Asia	**8 833**	**9 070**	**9 128**	**58**	**100.6**
incl. China	5 860	6 274	6 220	-54	99.1
EU (28)	**2 084**	**1 995**	**1 989**	**-6**	**99.7**
incl. Spain	509	507	507	-	100.0
America	**1 779**	**1 717**	**1 641**	**-76**	**95.6**
incl. Canada	683	691	608	-83	88.0
Others	**955**	**957**	**966**	**9**	**100.9**
Total	**13 656**	**13739**	**13 724**	**-15**	**99.9**

Source:ILZSG

In 2017 zinc production in the world remained at the 2016 level. Asia has the biggest relative share of the world production (67%) with a minimal growth by 0.6%. Its production directly depends on the production of China - the world's leading zinc producer, with a share of 45.3 %. In 2017 China reported a drop of 0.9%. **The EU(28) ranks second with a share of 15% and with an insignificant growth by 0.3%.** America follows with a share of 12% of the world production but with a decline by 4.4% , resulting mainly from the reduced mining in Canada and in Peru.

The most significant share of the EU production has Spain – 25.5%, Finland - 14.1% and Netherland – 13.2%.

Figure 3.9



World zinc production by regions, 2017, %

The relative share of zinc produced in Bulgaria represents 0.54% of the world production and **3.7% of the total EU (28) production**.

3.1.4. PRODUCTION OF PRECIOUS, BYPRODUCT METALS AND CHEMICAL PRODUCTS

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

The extraction of precious metals, byproduct metals and chemical products is carried out in separate capacities and technological schemes within the main production, and the volume of their production depends on the content and quantities of the processed primary raw materials (concentrates).

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

Table 3.10

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

Product:	2013	2014	2015	2016	2017	Difference 2017/2016	
						+/-	%
Cadmium ingots, t	411	382	344	362	333	-29	92.0
Silver, kg	55 637	50 200	37 955	52 526	53 053	527	101.0
Silver products, kg	5 474	4 838	2 785	2 445	2 764	319	113.1
Gold, kg	278	278	211	212	249	37	117.5
Gold products, kg	26	32	41	82	54	-28	65.9
Tellurium, kg	5 014	4 932	4 046	4 479	5 095	616	113.8
Sodium sulfate, t	1 846	1 520	1 372	342	1 747	1 405	510.1
Sulfuric acid, t	1352588	1309063	1340843	1209594	1532099	322 505	126.7

Source:Company data.

The Table shows increased quantities of precious metals (silver, gold) and tellurium in 2017, but the quantity of cadmium is declining.

As a result of the utilization of the sulfur contained in the primary concentrates, sulfuric acid is produced. Investments into the environment protection, the more complete use of sulfur and the growth of copper produced in 2017 led to growth in the production of sulfuric acid by 322.5 thousand tons.

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

Based on copper, zinc, lead, aluminum and their alloys, different metal products and articles (sheets, strips, foils, pipes, profiles, etc.) are produced with a higher value added.

Data about the production in the period 2013-2017 are presented in Table 3.11 and Fig. 3.10 and Fig. 3.11.

Table 3.11

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

Product	2013	2014	2015	2016	2017		Difference 2017/2016	
						%	+/-	%
R/P NFM and alloys	**65 462**	**63 940**	**57 353**	**57 700**	**71 853**	**44.1**	**14 153**	**124.5**
incl copper	44 445	42 298	41 329	46 649	57 244	35.1	5 595	122.7
brass	6 762	7 628	8 437	11 051	14 609	9.0	3 558	132.2
zinc	14 255	14 014	7 587	-	-	-	-	-
R/P aluminium - Total	**76 875**	**83 886**	**83 184**	**87 976**	**91 126**	**55.9**	**3 150**	**103.6**
Incl : „Alcomet“ JSC	60 960	64 790	64 894	65 646	67 096	41.2	1 450	102.2
„ETEM Bulgaria“ JSC	14 609	18 023	17 300	21 122	22 820	14.0	1 698	108.0
„EMC Distribution“ Ltd	1 306	1073	990	1 208	1 210	0.7	2	100.2
Total:	**142337**	**147826**	**140537**	**145676**	**162979**	**100.0**	**17303**	**111.9**

Source:Company data

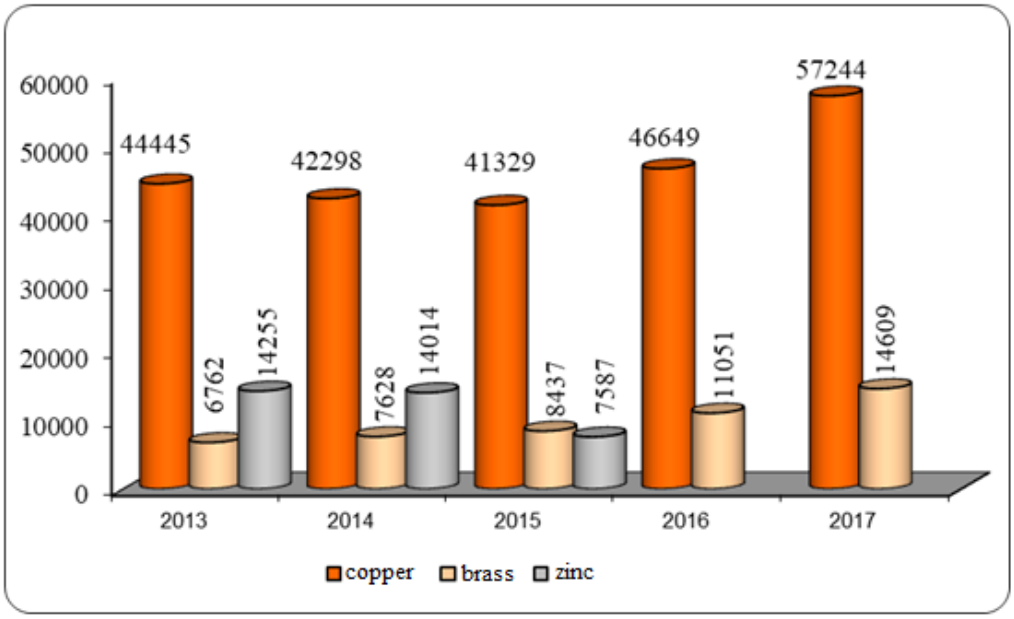
In 2017 the total quantity of R/P non-ferrous metals increased by 11.9%. This growth was achieved as a result of the significant increase in the production of heavy non-ferrous metals (HNFM) by 24.5%, which represents 44.1% of the total quantity. The R/P aluminum also increased by 3.6% - with a relative share of 55.9% (60.4% in 2016).

The main producer of products from heavy non-ferrous metals and their alloys in the country is „Sofia Med“ JSC. The company is a subsidiary of ElvalHalcor, which is part of Viohalko holding company, specialized in rolled and pressed production from copper, copper alloys, copper cables and aluminum products.

In the „Sofia Med“ JSC portfolio included are a wide range of rolled and pressed products (sheets, strips, circles, discs, bars, rods and profiles etc.) used in the construction, machine building, electrical engineering and other manufacturing sectors.

Figure 3.10 presents the quantities of R/P HNFM and alloys produced in the period 2013-2017 by types.

Figure 3.10



Production of R/P HNFM, tons

Data in Table 3.11 and Fig. 3.10 show that in 2017 the production of R/P copper grew by 22.7%, of the rolled by 28% and of the pressed - by 15.8%. Brass products are only rolled. For the period 2013 - 2017 the rolled brass has grown more than twice. Only in the previous year a growth by 32.2% was achieved.

In 2017 the ratio pressed/rolled copper to rolled brass produced was 79.7%/ 20.3% (80.8% /19.2% in 2016).
Rolled products represent 67.2% of total heavy non-ferrous metals production.
The company processed 15 559 tons of non-own scrap – by 35.6% more than 2016.

In 2017, „Sofia Med“ JSC made investments coming to BGN 13.2 million. Significant projects realized within the company:

- Modernization of the Line for Continuous Annealing in a Protected Atmosphere;

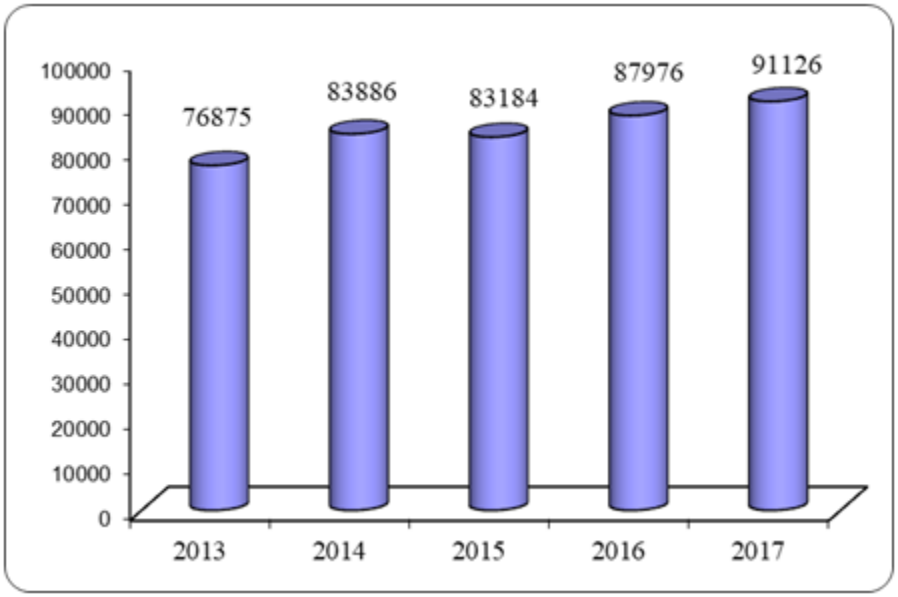
- Modification of coil milling line;

- Modernization of gas furnace for annealing.

The main producers of R/P aluminum are „Alcomet“ JSC - Shumen, „ETEM Bulgaria“ JSC - Sofia and „EMC Distribution“ Ltd - Rousse.

Fig. 3.11 presents the total quantities of produced R/P aluminum.

Figure 3.11



Production of R/P aluminum, tons

„Alcomet“ JSC is one of the leading manufacturers of rolled and pressed aluminum products on the Balkan Peninsula and the largest and the only company in the country combining the production of pressed (tubes, rods and profiles) and rolled (strips, sheets and foils) products from aluminum and aluminum alloys.

In the year 2017 the company produced 67 096 tons of rolled metal - by 1 450 tons more (2.2%) than in 2016. Alcomet's products represented 73.6% of the total R/P aluminum produced in the country.

The ratio rolled to pressed aluminum was 66.8%/33.2% (68%/32% in 2016).

In 2017 „Alcomet“ JSC realized investments amounting to BGN 30.16 million. The major part of them (ca. BGN 28 million) was invested in the new facility for rolled aluminum - a building, a cold-rolling line, a grinding compartment, a roller oil filtering system, an annealing furnace etc.

In the past year the company processed 6 543 tonnes of aluminum waste – by 17.1% more than in 2016.

„**ETEM Bulgaria” JSC** is producing long (pressed) aluminum - various types of profiles and architectural structures, mainly facade elements for the construction sector. For several years the company has been a certified manufacturer of automotive products, which now account for ca. 30% of the whole production and so the company is a subcontractor of some of the world's leading automobile companies.

In 2017 the share of „ETEM Bulgaria” JSC in the total production of R/P aluminum comes to 25% (24% in 2016), compared to the previous year the company reported an 8% increase in production.

For its constant and sustainable development the company is investing in modernization and expansion of production capacities, in implementing of innovative technologies and new products, which led to an increase in capacity and assortment. **In the past 2017, the realized projects amounted BNG 11 million.**

In 2017 **„EMC Distribution“ Ltd** produced 1 200 t welded aluminum pipes.

3.1.6. UTILIZATION OF NON-FERROUS METAL WASTE

Due to their capacities the metallurgical enterprises in Bulgarian are utilizing non-ferrous metals and alloys wastes from the household, from the construction and industry sectors. Their processing to final products is important for improving the economic performance, the environmental protection and to reduce the energy consumption. Data about processed non-ferrous metals waste in the period 2013 - 2017 by companies BAMI-members are presented in Table 3.12.

Table 3.12

Processed non-ferrous metal waste, tons

Waste	**Total**					**Difference 2017/2016**	
	2013	**2014**	**2015**	**2016**	**2017**	**+/-**	**%**
Copper	75 183	78 576	75 903	62 942	68 066	5 124	108.1
Lead	33 516	34 317	46 754	44 230	48 745	4 515	110.2
Zinc	11 363	13 193	11 983	16 802	16 226	-576	96.6
Aluminum	15 682	15 717	18 277	14 615	11 793	-2 822	80.7
Total	**135 744**	**141 803**	**152 917**	**138 589**	**144 830**	**6 241**	**104.5**

Source:Company data

The Table shows that in 2017 the total quantity of processed waste grew by 4.5%. Processed copper waste was by 5 124 tons more, and lead - by 4 515 tons. This increase was due to the larger quantities of copper waste used in KCM in the production of copper and R/P copper and by the extraction of lead and its alloys as well.

Processed aluminum waste decreased by 2 822 tons and zinc – only by 576 tons.

3.2. TRADE EXCHANGE AND CONSUMPTION OF NON-FERROUS METALS

Non-ferrous metals and their products are subject of stock exchange and are traded at the international markets prices, generally of the London Metal Exchange (LME). The figures below show the dynamics of the prices of basic metals, produced in Bulgaria in the period January - December 2017, data are obtained from the official publications of the LME.

Figure 3.12

Copper prices (USD per ton)

During the first half of the year electrolytic copper prices remained at levels between 5 500 and 6 000 USD/ton. In the third quarter a growth starts coming by the end of the year to over 25% and remains so far at the same level.

Figure 3.13

Lead prices (USD per ton)

Graph in Fig. 3.13 shows the price changes of refined lead. By the beginning of the year there was a retention, by the mid of the period a decline was registered with a moderate rise after that. On a yearly basis, the difference between the maximum and minimum average monthly prices of lead is ca. 370 USD /t - a change by 17%.

Figure3.14

Zink prices (USD per ton)

The dynamics of block zinc prices is similar to these of lead - relatively stable till June in the range 2 550 - 2 700 USD/ ton, increasing in the second part of the year and exceeding by end of the year 3 000 USD/ ton.

Compared to 2016, the prices of the basic non-ferrous metals in 2017 are rising. This favorable trade situation has a positive impact on the non-ferrous metal industry and stimulates growth and innovations.

The Bulgarian metallurgical companies producing copper, zinc and lead are net exporters and have good market positions within the world trade. The higher metal prices led to a growth in export’s value and of companies profit resulting from the realization of their production. As a result, the relative share of the non-ferrous metals in the country's export increased significantly and the foreign trade balance was improved.

3.2.1. IMPORT OF NON-FERROUS METALS AND FINISHED PRODUCTS

The quntites of imported non-ferrous metals, alloys and finished products during the last five years are shown in Table 3.13.

Table 3.13

Import of non-ferrous metals and finished products, tons

Items	2013	2014	2015	2016	2017	Difference 2017/2016	
						+/-	%
Copper, total, incl.	**81 300**	**86 161**	**85 908**	**93 052**	**108 990**	**15 938**	117.1
Anodes	1 504	924	211	127	1	-126	0.8
Cathodes, alloys, blanks	13 921	13 812	12 211	20 498	38 994	18 496	190.2
Scrap	56 040	60 453	59 728	49 543	55 299	5 756	111.6
Bars and profiles	4 415	5 006	5 411	5 632	5 682	50	100. 9
Wire	2 600	2 782	4 783	13 613	5 332	-8 281	39.2
Sheet and foil	1 521	1 416	1 594	1 292	1 334	42	103.3
Pipes	1 299	1 768	1 970	2 347	2 348	1	100.1
Lead, total, incl.	**34 932**	**29 262**	**25 181**	**35 463**	**31 059**	**-4 404**	87.6
Ingot and alloys	23 536	12 439	8 394	16 482	16 203	-279	98.3
Scrap (pure)	11 050	16 660	16 484	17 827	14 461	-3 366	81.1
R/P metal	346	163	303	1 154	395	-759	34.2
Zinc, total, incl.	**4 323**	**9 660**	**6 491**	**3 896**	**1 398**	**-2 498**	35.9
Ingot and alloys	2 765	8 746	5 322	3 243	656	-2 587	20.2
Scrap	630	504	610	148	50	-98	33.8
R/P metal	928	410	559	505	692	187	137.0
Aluminum, total, incl.	**150621**	**135148**	**150548**	**158162**	**171041**	**12879**	108.1
Ingot and alloys	105 738	94 982	108 968	116 066	123 757	7 691	106.6
Scrap	1 742	1 607	2 917	1 533	2 261	728	147.5
Bars and profiles	17 727	16 770	17 648	19 458	22 022	2 564	113.2
Wire	3 732	3 190	3 562	4 309	4 235	-74	98.3
Sheets and strips	10 010	11 992	10 696	9 837	10 821	984	110.0
Foil	5 442	5 453	5 040	4 863	5 586	723	114.9
Pipes	6 230	1 154	1 717	2 096	2 359	263	112.6
Total, tons	**271176**	**260231**	**268128**	**290573**	**312 488**	**21915**	107.5
Value, EUR million	**753.5**	**742.0**	**792.0**	**739.6**	**1008.2**	**268.6**	136.3
Value, BGN million	**1473.7**	**1 451.3**	**1549.0**	**1446.5**	**1971.9**	**525.4**	136.3

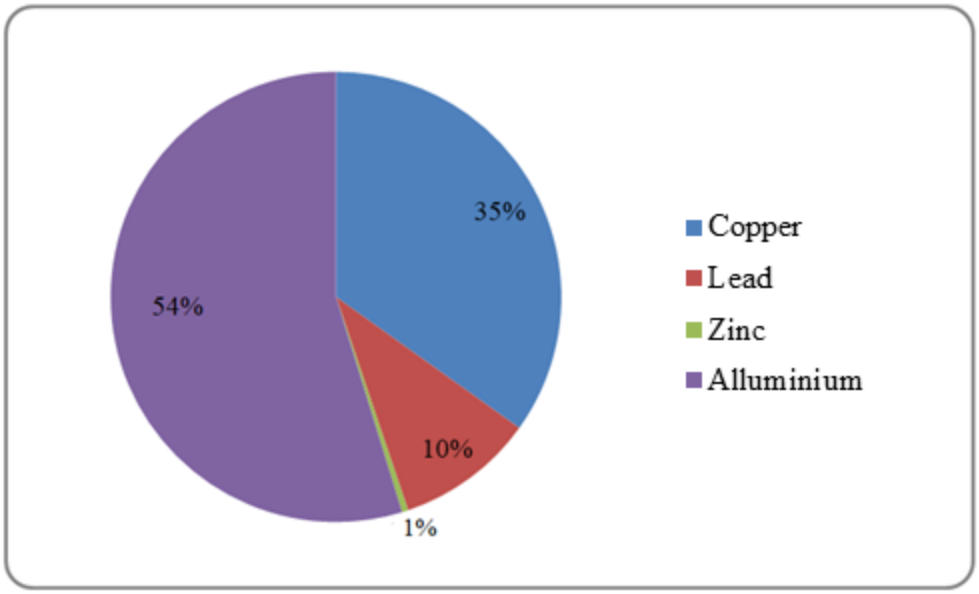
Source: Customs statistics and NRA

The metals and metallurgical products included in the Table actually form the import realized in the sector as far as the entered numbers are real quantities and values by basic groups.

The data show that in 2017 imported were 312 488 tons of non-ferrous metals and their products worth BGN 1 008.2 million. Compared to 2016 the volume of

imports grew by 7.54% measured by natural indicators and increased by BGN 136.35 million due to the higher metal prices.
The structure of the import of non-ferrous metals and their products is presented in Fig. 3.15.

Figure 3.15



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

The import of aluminum ingots accounted for ca. 73% of the product group aluminum/aluminum products. As far as it is not produced in the country, this metal is traditionally accounting for a **high share of the total non-ferrous metals import – for 2017 it reached 53.2%** (40% in 2016), with a growth by 6.6%. The biggest share of the import is coming from Russia - 44%, followed by the EU – ca. 35% and Greece - ca. 22%.

The import of aluminum products is growing by 11%; the import from the EU was 62%, 24% come from Turkey and 13% - from other countries.

The largest share of the imported **copper and copper products** occupies the **copper waste - 50.7%** of the total quantity. Copper waste is used as an efficient and environment friendly raw material in the production of electrolytic copper and copper end products. They accounted for 17.7% of total non-ferrous metal imports (17% in 2016). Ca. 56% of the copper waste was imported from the Balkan countries.

Refined copper and copper alloys are mainly imported from Serbia (48.6%), Russia (36.3%) and only 3% from EU member states. Due to the increased production of R/P copper and brass in the country, the import was duplicated in

2017 compared to 2016. The import of copper products is decreasing by ca. 36%.

The unprocessed **lead (ingots) incl. lead alloys** accounted for 52.2% in the group imported lead and lead products in 2017 with a growth by 1.7%. The largest volumes were imported from Serbia - 44.2%, Korea - 22.1% and Russia - 7.1%, only 16.3% came from the EU. **Lead metall wastes (scrap) represented 46.6%** of the total quantity in this group and ca. 5% of the total import of non-ferrous metals and their products. It is used as a raw material for the production of lead and lead alloys. Romania delivered 83.3% and Greece - 9.2% from the import. Compared to the previous year the import of lead waste decreased by 18.9%.

Imports of **unprocessed zinc** are decreasing continuously. In 2017 it was 2 600 tons or by 80% less than in the previous year. The local consumption is mainly of local production - over 90%. Imports are coming only from EU member states.

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 2013 – 2017 are presented in Table 3.14.
The total volume of exports in 2017 was 682 284 tons, worth BGN 6 039.1 million. Compared to the previous year, in natural terms, it grew by 95 524 tons (16.3%). The increased quantities of exported metals and finished products, and the higher prices in 2017, led to a significant **increase of the export value (by 50.6**%).

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 products (profiles, sheet, strips, foil etc.) with a high value added. Due to the limited domestic consumption and the available modern processing capacities a large part of these products is primarily export-oriented.
In 2017, exports of **electrolytic copper** grew by 5.4%. More than 40% of the export was directed to China, 24.6% to Turkey, and 25.1% - to EU countries. Traditionally exports of R/P copper and brass (sheet, strip, bars etc.) go mainly to EU countries (82.6%). Compared to 2016 exports of copper products increased by 12.9%.
In 2017 export of **lead** remained at the same level as in the previous year. 60.9% of the exported quantities were to Turkey and 33.1% - to EU countries.

Table 3.14

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

Items	2013	2014	2015	2016	2017	Difference 2017/2016	
						+/-	%
Copper, total, incl.	**384 110**	**371 935**	**385 745**	**320 834**	**410 221**	**89 387**	**127.9**
Anodic copper	121 281	116 252	118 755	75 585	146 617	71 032	194.0
Electrolytic copper	199 741	196 880	209 554	185 485	195 425	9 940	105.4
Scrap	10 760	8 488	7 176	7 176	8 826	1 650	123.0
Bars and profiles	21 754	18 800	19 888	19 582	21 945	2 363	112.1
Wire	1 115	1 169	635	6 107	324	-5 783	5.3
Sheet, strips and foil	29 433	30 297	28 996	26 758	36 872	10 114	137.8
Pipes	27	49	741	141	212	71	150.4
Lead, total, incl.	**73 834**	**83 152**	**81 045**	**77 791**	**81 782**	**3 991**	**105.1**
Ingots	73 576	83 056	80 865	77 527	77 577	50	100.1
R/P lead	113	79	82	85	98	13	115.3
Scrap (pure)	145	17	98	179	4 107	3 928	2294.4
Zinc, total, incl.	**70468**	**76 609**	**72 535**	**74 044**	**66 398**	**-7 646**	**89.7**
Ingots	54 272	60 879	62 920	73 202	65 048	-8 154	88.9
R/P metal	14 843	14 347	8 267	176	687	511	390.3
Scrap	1 353	1 383	1 348	666	663	-3	99.5
Aluminum, total, incl.	**103 813**	**112150**	**111496**	**114 091**	**123 883**	**9 792**	**108.6**
Ingots	6 465	7 874	7 073	4 422	5 840	1 418	132.1
Scrap	22 766	23 584	22 351	24 153	27 638	3 485	114.4
Bars and profiles	24 982	28 720	30 358	31 686	34 901	3 215	110.1
Wire	423	386	258	154	108	-46	70.1
Strips and sheets	16 711	17 288	14 785	13 737	16 060	2 323	116.9
Foil	23 733	23 993	26 512	29 765	29 238	-527	98.2
Pipes	8 734	10 305	10 159	10 174	10 098	-76	99.3
Total	**632225**	**643846**	**650821**	**586760**	**682284**	**95524**	**116.3**
Value, EUR million	**2 717.2**	**2 562.8**	**2 628.9**	**2 050.3**	**3087.7**	**1037.4**	**150.6**
Value, BGN million	**5 314.4**	**5 012.4**	**5141.7**	**4 010.1**	**6039.1**	**2029.0**	**150.6**

Source: Customs statistic and NRA

In 2017 export of **unprocessed zinc** (ingots) decreased by 11.1%. The main markets were the EU countries - 52.7%, the rest was directed to neighboring Balkan countries (Turkey, Serbia and Macedonia).

73 % of the export in the group of **aluminium** is taken by **R/P aluminium.** In 2017 it is growing by 5.7%, most significant growth made sheets and stripes

(16.9%). The aluminum foil occupies 32.3% of the R/P aluminum. More than 95% of R/P aluminum was sold to EU countries.

Aluminium and aluminium alloys produced from secondary raw materials take 4.7% of the total quantity of exported aluminium. In 2017 the export of these products increased by 32.1%.

Copper, lead, zinc and aluminum wastes account for 6% of total non-ferrous metals and finished products. **Aluminum waste and copper scrap** hade the largest share. The export of aluminum waste increased by 14.4% and this of copper scrap - by 23%, compared to 2016. Most significant, however, is the increase of the exported lead waste - about 23 times more, coming to 4 107 tons.

The main quantities of the aluminum waste (over 80%) are exported to EU countries.

The largest copper scrap was exported to China - 43.3%, followed by EU countries – 40% and Turkey - 9.6%. Almost 100% of the lead waste was exported to Romania.

Tables 3.13 and 3.14 allow the following conclusions to be drawn about the trade exchange in 2017:

- N**on-ferrous metals and finished products export** exceeded their import by 2.3 times in terms of quantity and showed an overtaking growth by 16.3%;
- **The export value reached BGN 6 039.1 million in 2017 - by BGN 2 029 million (50.6%) more** than in 2016. This growth is due both to the larger quantities of exported non-ferrous metals and finished products, and to the higher average prices in 2017;
- **The non-ferrous metals and finished products** import increased by 7.5% and due to the higher prices a significant increase was registered in terms of value - by 36.3%.

The non-ferrous metallurgy in Bulgaria has a strong export orientation, with a positive foreign trade balance both in terms of quantity and in value.

3.2.3. FOREIGN TRADE TURNOVER OF NON-FERROUS METALS

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

Table 3.15

Foreign trade turnover of non-ferrous metals, tons

Indices	2013	2014	2015	2016	2017		Difference 2017/2016	
							+/-	%
Import	271 176	260 231	268 128	290 573	312 488	31.4	21 915	107.5
Export	632 225	643 846	650 821	586 760	682 284	68.6	95 524	116.3
Total turnover	903 401	904 077	918 949	877 333	994 772	100.0	117 439	113.4
Balance	361 049	383 615	382 693	296 187	369 796		73 609	124.9

Source: Customs statistics and NRA

Data in Table 3.15 show that in 2017 the total amount of exported and imported non-ferrous metals, which form the total foreign trade turnover, increased by 117 435 t (13.4%). The reasons are the growth of exports and imports of copper, R/P aluminum and some copper end products, and the increased copper waste import. At the same time the import of aluminum ingots is increasing, too. **As an end result the balance in terms of quantity shows an increase by more than 73 000 tons.**

In terms of value in 2017 the foreign trade turnover increased by BGN 2 554.4 million (46.8%). As a result of the significant, overtaking growth in export value, **the foreign trade balance reached BGN 4 067.2 million, favorable effecting the foreign trade balance of Bulgaria.**

Table 3.16

Foreign trade turnover of non-ferrous metals, BNG million

Indices	2013	2014	2015	2016	2017		Difference 2017/2016	
						%	+/-	%
Import	1 473.7	1 451.3	1 549.0	1 446.5	1 971.9	24.6	525.4	136.3
Export	5 314.4	5 012.4	5 141.7	4 010.1	6039.1	75.4	2029	150.6
Total turnover	6 788.1	6 463.7	6 690.7	5 456.6	8 011	100.0	2 554.4	146.8
Balance	3 840.7	3 561.1	3 592.7	2 563.6	4 067.2		1 503.6	158.7

Source: Customs statistics and NRA

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

Table 3.17 and Fig. 3.16 present a company information on sales of Bulgarian production of non-ferrous metals and R/P products for the period 2013 - 2017.

Data show that in 2017 the sales on the local market are decreasing coming to 8.9% of the total sales (12.1% in 2016). The export accounted for 91.1% of the metallurgical production (87.9% in 2016).

Table 3.17

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

Items	Seals	2013	2014	2015	2016	2017
Anodic copper	Home market	-	-	-	-	-
	Export	121 282	116 209	118 573	70 793	146617
	Total	**121 282**	**116 209**	**118 573**	**70 793**	**146617**
Electrolytic copper	Home market	32 889	35 166	28 006	29 033	21 315
	Export	194 820	191 383	208 150	185006	207252
	Total	**227 709**	**226 549**	**236 156**	**214039**	**228567**
Lead and alloys	Home market	23 327	20 611	21 473	27 838	26 293
	Export	67 717	72 355	75 714	72 411	75 157
	Общо	**91 044**	**92 966**	**97 187**	**100249**	**101450**
Zinc and alloys	Home market	19 081	17 681	12 692	6 690	6 717
	Export	52 545	55 952	57 618	70 615	63 734
	Total	**71 626**	**73 633**	**70 410**	**77 305**	**70 451**
R/P HNFM	Home market	1 842	1 450	1 563	1 619	1 403
	Export	64 887	62 999	55 890	56 174	70 145
	Total	**66 729**	**64 449**	**57 453**	**57 793**	**71 548**
R/P aluminum	Home market	8 071	7 537	8 616	8 054	7 145
	Export	68 092	76 437	73 931	78 553	82 045
	Total	**76 163**	**83 974**	**82 547**	**86 607**	**89 190**

Source: Company data,

Electrolytic copper – 90.7% of the sales were realized on the international market and 13.6% remained for home consumption. Due to the decrease of the

sales on the home market by 7 718 tons, the import increased and respectively the final home consumption (Table 3.18).

Lead and lead alloys - 74.1 % of the sales were realized on the international market and on the local market - the rest of 25.9%. In comparison to 2016 the sales on the local market decreased by ca. 2%.

Zinc – the export structure was identical with this in 2016 - 90.5 % of the production was for export and 9.5% were sold on the home market.

R/P HNFM - in 2017 the local producers delivered to the home market up to 2% of the whole realized quantities. The production was mainly sold on the international market – the export increased by 23.8% and accounted for 98% of the total quantities realized.

R/P aluminum – despite the larger production, the sales on the home market decreased to 8% and the export increased respectively by 92%.

The structure of basic and R/P metals total sales in the last five years, according to company data, is presented on Figure 3.16.

Figure 3.16

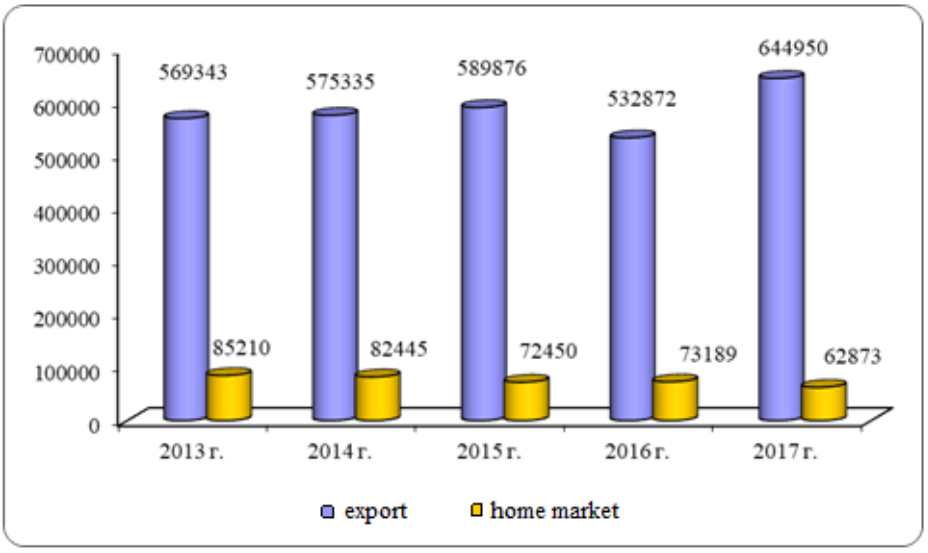


Fig. 3.16 shows that in the last five years, despite the changes in the world market situation (prices, political and economic environment etc.), the quantities of non-ferrous metals and end products produced in Bulgaria and exported are constantly increasing. In 2017 a peak of the export is reached and a growth by more than 20%. An only between 9% and 13% of the total production was realized on the local market.

Based on the above, the conclusion could be drawn that the non-ferrous metallurgy in Bulgaria is a net exporter with great export potential and a

significant contribution to the improvement of the country's foreign trade balance.

3.2.5. CONSUMPTION OF NON-FERROUS METALS AND ALLOYS

Table 3.18 and Figure 317 illustrate the real home consumption (RHC), formed as the sum of sales of non-ferrous metals on the home market (according to data supplied by the Bulgarian producers) and the import reported by the Customs Agency and the NRA in the period 2013 - 2017.

Table 3.18

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

Items	**Origin**	**2013**	**2014**	**2015**	**2016**	**2017**	
							%
Electrolytic copper	Local production	32 889	35 166	28006	29 003	21 315	35.3
	Import	13 921	13 812	12211	20 498	38 994	64.7
	Consumption	**48 810**	**48 978**	**40217**	**49 501**	**60 309**	**100.0**
Lead	Local production	23 327	20 611	21473	27 793	26 293	61.9
	Import	23 536	12 439	8394	16 482	16 203	38.1
	Consumption	**46 863**	**33 050**	**29867**	**44 275**	**42 496**	**100.0**
Zinc	Local production.	19 081	17 681	12692	6 690	6 717	91.1
	Import	2 765	8 746	5322	3 243	656	8.9
	Consumption	**21 846**	**26 427**	**18 014**	**9 933**	**7 373**	**100.0**
R/P NFM	Local production	1 842	1 450	1563	1 619	1 403	8.2
	Import	11 109	11 545	14 620	24 543	15 783	91.8
	Consumption	**12 951**	**12 995**	**16 183**	**26 162**	**17 186**	**100.0**
R/P aluminum	Local production	8 071	7 537	8616	8 054	7 145	13.7
	Import	43 141	38 559	38663	40 563	45 023	86.3
	Consumption	**51 212**	**46 096**	**47 279**	**48 617**	**52 168**	**100.0**

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

In 2017, 49.4% of the domestic consumption of the basic non-ferrous metals (copper, lead and zinc) was covered by local production (61% in 2016) and the share of the imported metals was 50.6%.

The RHC of electrolytic copper increased by 22% due to the significant growth in the production of copper products.

The RHC of lead shows a slight decrease by ca. 4%. The RHC of zinc is decreasing for a third consecutive year - there was a decline of 26% compared to 2016.

In 2017, the RHC of R/P heavy non-ferrous metals decreased by 65.7% - ca. 10 thousand tons, both with a decrease of the import and of the sales of local producers. The share of the local production was 8.2%, the imports accounted for 91.8% of the demand.

The RHC of R/P aluminum is covered mainly by imports. In 2017 the country's demand is growing by 7.3%. Sales from domestic producers on the local market decreased by ca. 1 000 tones and respectively the import increased by ca. 5 000 tones.

There is still no clear trend the RHC of NFM and R/P of them to grow based on the development of other industrial sectors within the value added chain, therefore the NF metallurgy will remain a net exporter both in quantities and in value, with a significant share in the structure of the Bulgarian economy and in good's exports.

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- *„BMB Metal“ Ltd*
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- *„KCM“ JSC*
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- *„ KCM Trade“ LTD*
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„Shamot LP 2007“ LTD

„ El Stomana“ JSC

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