



BULGARIAN ASSOCIATION OF THE METALLURGICAL INDUSTRY

METALLURGY IN BULGARIA

2019

SOFIA, 2020

Bulgarian Association of Metallurgical Industry (BAMI) has been compiling the specialized annual edition about the metallurgical sector for three decades, providing information and statistical data on the situation and development of the sector, trade and consumption of metals and metallurgical products.

The publication “Metallurgy in Bulgaria” is intended for managers and experts from metallurgical companies, lecturers, students from technical schools and universities, Bulgarian and foreign partners, external experts and readers with interests in metallurgy.

BAMI’s team working on the Annual "Bulgaria's Metallurgy in 2019" expresses its gratitude to all compnies that provided data on their production activities through the year, their sales on the Bulgarian market and exports, both to the EU and third countries, present ot planned investments.

We express our special gratitude to the Ministry of Economy as well, for the data on import and export of metal products. Without it the analisis would not be objective and punctual.

Due to the specific topic and purpose, the Annual includes only official economic, statistical and production information. It does not include BAMI’s activities preformed by the Board and executive staff during the year. These issues are subject to other reports which can e view on the Association’s website - www.bami.bg

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

DEAR LADIES AND GENTLEMEN,



The first months of 2020 turned out to be difficult for us, for Europe and for the world. Despite the imposed emergency and epidemic situation, the metallurgical industry continued to work, fulfilling its obligations to workers, suppliers and customers. The problems and limitations did not violate the traditional task of the Bulgarian Association of Metallurgical Industry (BAMI) to prepare the specialized edition Metallurgy in Bulgaria in 2019.

As in all previous publications, the Annual again contains important data for the metallurgical industry and indicators, gathered and summarized for a period of several consecutive years; information about Bulgarian, European and world production.

In 2019 the Bulgarian economy reported growth and good results once again. Despite world conflicts, trade wars and unfair market fights, ferrous and non-ferrous metals producers managed to fulfil their plans and programmes.

The main goals for all our members and metallurgy as a whole are related to sustainable development based on investments in new technologies and productions with high added value, providing good working conditions and environmental protection. Improving qualification and continuing education, social policy, supporting local authorities for the benefit of the people of the respective regions were also among our priorities.

These successes give us, the producers of ferrous and non-ferrous metals and accompanying activities, a reason to have high self-confidence due to what has been achieved and to believe in our future. Metallurgy is this branch of industry that forms the good achievements of the country today, and has potential for its future development.

I express my gratitude to everyone who contributed to the preparation of this publication, which provides useful information for Bulgarian metallurgists and a wide range of users from the country and abroad.

Yours faithfully,

ANTON PETROV

Chairman of the Board

SECTION ONE

THE ECONOMY IN 2019 (BULGARIA AND EU – REVIEW)

1.1. POPULATION, LABOR MARKET, WAGES

The Bulgarian economy had a successful development in 2019, the results are positive in the main industrial and service sectors. There are many external and internal factors influencing various indicators, such as financial stability, national and world markets, trade sanctions, military conflicts. All these factors not only did not improve during the year, but even escalated, especially in the field of international trade. The growth of the EU economy is low, sanctions are being imposed on Russia, there are tariffs imposed by the United States on metallurgical products, the migrant crisis and regional conflicts in the Middle East. In this complicated situation the Bulgarian industry, including metallurgy, reported good economic indicators and growth. The Bulgarian economy is more negatively affected by internal factors, such as the demographic crisis, problems in the educational system and labor market, unreformed energy sector and migration of young people from the country.

In 2019, the trend for growth of the GDP in the last few years continues, according to preliminary NSI data **the expected growth is 3.4%**. This growth is not enough to change the EU's ranking of key economic indicators and living standards in the Member States. Again, our country takes the last place out of all 27 countries.

Demographic characteristics and population indicators are getting worse – number, age and education. In 2019 **the population of Bulgaria decreases by 46 545 people**, compared to 50 000 in 2018.

The statistical data given in table 1.1 show the yearly reduction of the population and the changes in its structure.

Table 1.1

Population by categories, thousand people

Population categories:	2016		2017		2018		2019	
	' 000 people	%						
City/town population	5 204.4	73.3	5 181.8	73.7	5 159.1	73.7	5 125.4	73.7
Village population	1 897.4	26.7	1 868.3	26.5	1 840.9	26.3	1 826.1	26.3
Males	3 449.9		3 422.4		3 395.7		3 369.7	
Females	3 651.9		3 627.6		3 604.3		3 581.8	
Population categories:	7 101.8	100.0	7 050.0	100.0	7 000.0	100.0	6 951.5	100.0

Source: NSI

The ratio between the urban and village population is 3:1, and over the years the difference has increased slightly in favor of those living in the cities. For the four-year period the villages have becoming depopulated even faster and the share of their population has decreased by 0.4%

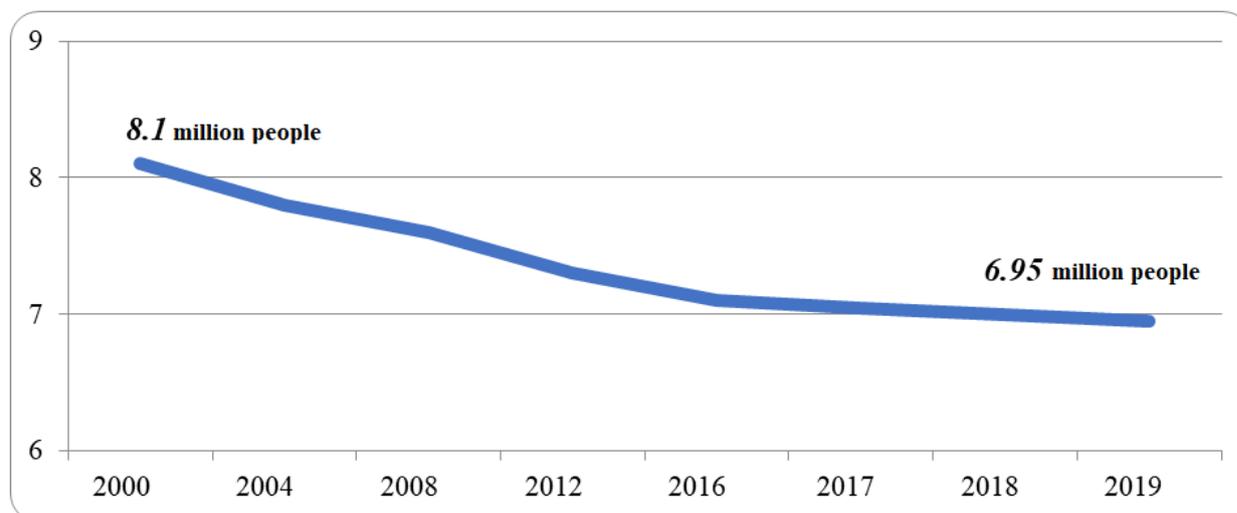
The decrease of the population is a result of many factors, including the ongoing migration processes during the respective year. NSI data on external migration in the 2019 show:

- Residents (*immigrants*) – 37 929 people – by 8 370 more than in 2018;
- Migrated (*emigrants*) - 39 941 people - by 6 716 more than 2018, 94% of them are Bulgarian citizens

The growth of the economy and the shortage of work force on the labor market in the country does not stop the flow of the outgoing working population, but at the same time the influx of settlers increases. The balance of migration processes for 2019 shows a **negative mechanical increase of -2 012 people**, but it decreases compared to previous periods (negative increase of -3 666 people in 2018 and - 5 989 in 2017).

There is no reversal in the direction in terms of population, which over the past 20 years has been going down by an average of 50 thousand people per year and is now below 7 million. Figure 1.1 shows this declining trend from the year 2000 until 2019.

Figure 1.1



Population in Bulgaria, million people

According to EUROSTAT and the NSI data, the natural growth in Bulgaria in recent years has the largest negative values within the EU (28) and in 2019 it is - 6.7 per 1000 people.

The low birth rate and the still negative results of the migration processes lead to unfavorable age characteristics and reduction of the working age population.

For 2019, the structure of the population by groups is as follows:

- Under working age (under 15 years old) – 15.3 %, in EU – 15.6 %;
- At working age – 59.8 %;
- Above working age – 24.9 %

For one year the share of children under 15 and those under working age (under 16 years old) increased by 0.1%, at the expense of the working population, which decreased by 0.2%.

The group of 15 to 24 year-olds has the biggest positive influence on the labor market and it is the most promising as well. For the period under review, it has a steady decline, which for the last ten years is 23.5%. The share of this group was 12.2% in 2010 and it reached the lowest value 8.9%, in 2019, compared to the EU average of 10.7%. For the same ten-year period, the relative share of the same group in the EU population also went down, but only by 1%, and in Bulgaria by 3.3%, 3 times more. In these conditions of demographic crisis/catastrophe, **Bulgarian economy, respectively industry cannot rely on a better labor market without the inclusion of work force from third countries.** Change and solution to this very important problem for business and new investments can occur with a change in government policy to “import” workers with simplified procedures.

Demographic characteristics depend on the quality of life and standard of living in the country, respectively on life expectancy of the population. NSI data for 2018 show that **the average life expectancy in the EU (28) is 81.0 years, in Bulgaria 75.0, or 6 years less. For women the difference is 5 years (83.6 / 78.6), and for men - 6.8 years (78.3 to 71.5).** Bulgarians the shortest life expectancy among all Europeans, including those in the Balkan region. Only in Bulgaria and Romania the average life expectancy of women is less than 80 years.

Spain (83.5) and Italy (83.4) have the longest life expectancy among the European countries with the average duration exceeding that of the EU by about 3 years. Some experts consider this fact to be one of the reasons for the high morbidity and death rate resulting from COVID 19 in both countries.

Labor market is related to demographic characteristics and the changes that occur in them. With a declining population and a low relative share of young people, it cannot be expected that free workforce for Bulgarian industry will be available now and in the near future, especially with higher economic growth and launching new activities and productions. Digitalization of economy and industry will reduce these needs to some extent, but will set much higher educational and qualification requirements.

Data on the average annual **number of employees** under labor and employment contract, on labor income and some social parameters for a 5-year period is given on Table 1.2.

Table 1.2

Average number of employed people, level of unemployment, inflation

Indicators	2015	2016	2017	2018	2019*
Average annual number of employed people (national calculations), in thousands	2 254.8	2 277.3	2 308.1	2 238.4	2 236.2
Average annual number of registered unemployed people, in thousands	305.1	247.2	206.9	173.3	142.8
Average annual level of unemployment (NSI), %	9.1	7.6	6.2	5.2	4.2
Inflation/deflation rate	- 0.1	- 0.8	2.1	2.4	3.1
Average monthly wage of persons on labor and service contracts, BGN	878	962	1 037	1 135	1 274
- public sector	926	984	1 065	1 165	1296
- private sector	863	954	1 029	1 126	1 267
- incl. processing industry	761	846	930	1 018	1 127
Average monthly wage in activity 24. "Production of basic metals":	1 187	1 303	1 356	1 489	1 580
• ferrous metallurgy	1 077	1 257	1 440	1 664	1 764
• non-ferrous metallurgy	1658	1774	1 770	1 911	2 025
• metal casting	740	827	943	1 003	1 063

Source: NSI, *preliminary data

The number of employed people is a function of the current and change in Bulgarian economy. In the last few years with growing economy, an increase in the number of employed people is registered. Accordingly, it is reported that the number of unemployed people decreases as well as the **unemployment rate**, which in 2019 reaches almost a minimum sanitary value of **4.2%**. These indicators are reduced in half for the period presented in the table and they confirm the **deficit in work force for the growing needs of Bulgarian business. There is also no increase in the number of employed people in the last year.**

In 2020 significant changes are expected in relation to the pandemic situation and the following economic crisis in global and national economy and its impact on the labor market.

The table shows the income of employees for the last 5 years – it has increased by 55% for the whole period, and by 12.2% in 2019 alone. The average monthly salary in the country in 2019 reaches 1 274 leva, an increase of 139 leva compared to 2018. In the public sector, the average monthly salary is 28 leva higher than in the private sector.

For the entire manufacturing industry, of which the metallurgical industry is a part, the average monthly salary in 2019 is 1 127 leva, with an annual increase of 109 leva (10.7% increase). For comparison, in 2018 the average monthly increase in industry was 88 leva, an increase of 9.5%. Wages in the country are growing disproportionately to economic growth and key indicators.

In recent years, GDP growth is being reported in the range of 3 - 3.4%, and wages in the public and private sectors for the same periods increased by more than 10%. This disproportion is also created as a result of the administratively increased minimum wage for the country, without justification and inconsistent with the real economic results and labor productivity.

The average annual income of workers in the metallurgical sector is formed not only by the received salaries, but also by other financial benefits, such as free (or with a discount) daily food, reduced working hours, higher social security contributions, benefits, etc., which form the costs of employers for the work of one employee.

These additional payments to the amount of average wages of workers in the production of metals and rolled metal are also one of the highest in the country. For the entire economic activity, which includes ferrous and non-ferrous metallurgy and casting of metals according to NSI data for 2018, the average monthly wage increased by 10%, and only in ferrous metallurgy - over 15%. According to preliminary data for 2019, the average salary in the sector reported an increase of 6%. The highest average salary is in the non-ferrous metallurgy - almost twice the average in the processing industry.

Traditionally, the minimum wage is negotiated with the trade unions and included in the Branch Collective Labour Agreement. For the period 2019 - 2020, the minimum wage was adopted with 100 higher than in the country, higher values of additional payments and social benefits were also agreed on.

Due to the specific working conditions in the production of metals, additional financial costs are made for the employees, which increases the labor costs for the employers in addition to the worker's salary. For most economic sectors and activities, these costs are not inherent.

In metallurgy, mining and energy the relative share of wages in the **total labor costs of the employer is about 70%** despite the high levels of average wages. In the other activities of manufacturing industry and on average for the country the expenses for salaries have a share of 82%. Employers in the base industries have higher costs for **social security payments, reduced working hours and additional annual leave, for specific working conditions, social benefits and allowances.**

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

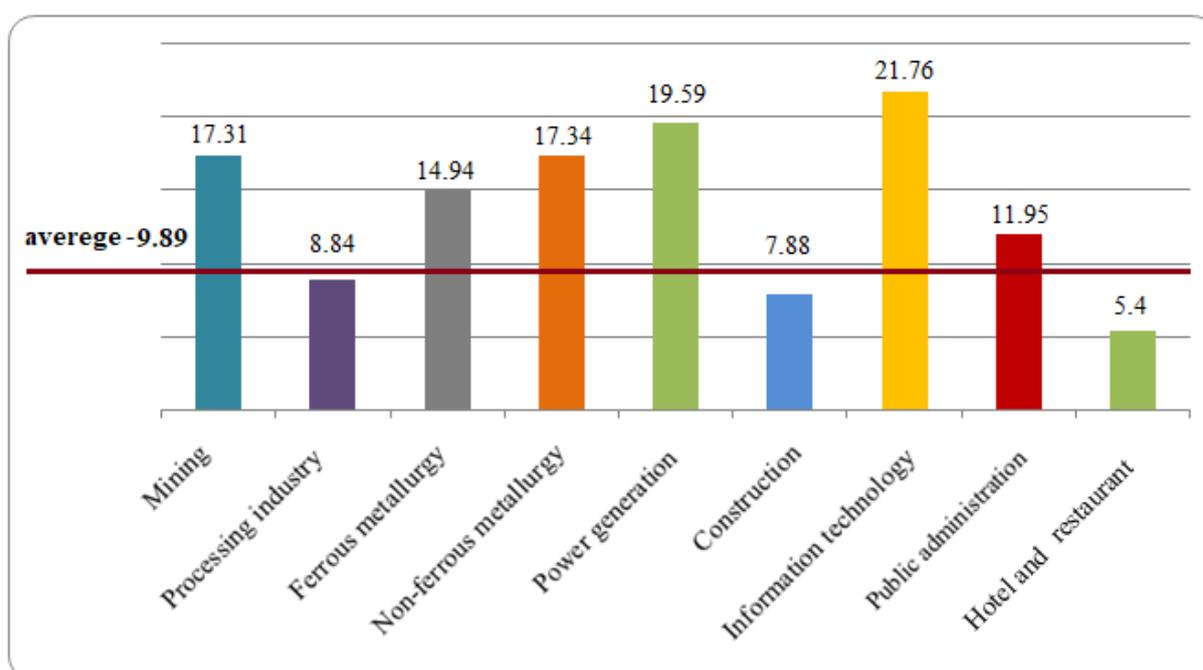
Table 1.3

	Wage	Insurances by the employer	Other social allowances*
Total for the country, %	81.8	14.7	3.5
Mining	71.6	19.0	9.4
Processing industry incl. metallurgy	82.0 71.0	14.8 18.0	3.2 11
Energy	70.2	16.8	13
Informatics and telecommunications	87.1	10.9	2

*incl. compensation paid

Figure 1.2 presents the employer's costs per hour of labor in leva for employees under labor and service contract in 2018 – average for the country and in the main industry sectors, incl. the metallurgy.

Фиг. 1.2



Employer's labor costs, BGN/ working hour

Source: NSI

The table and figure show that the highest costs per hour worked are in the IT sector, but their salary has the largest share - above 87%. Close to the values in this sector are the costs for employers in the energy sector, the third place is for non-ferrous metallurgy. After them are the mining industry and **ferrous metallurgy, which ranks 5th** in terms of labor costs per hour worked by economic activities in the country.

The lowest costs are in the hotel and restaurant sector, only 5.4 leva per 1 working hour, which is almost 2 times lower than the average costs for employers for the country. They work on a minimum wage, which determines their small contribution to budget revenues and those of the National Social Security Institute, but with a high share in the gray economy. Despite these unfavorable characteristics, the VAT due by the sector for 2020 is reduced, without assessing the benefits from this decision.

Compared to the previous 2017, labor costs in the country as a whole increased by 110%, mainly in wages.

1.2. GDP, GVA, PRODUCTIVITY

2019 is another year of growth for world, EU and Bulgarian economy According to IMF data from April this year, the world economic growth is 2.9%, as for developed economic countries it is 1.7%, and for countries with emerging markets and developing economies - 3.7%. China has the highest growth in 2019 - 6.1%. For the European Union (27), the overall economic growth is 1.7%. Bulgaria reports GDP growth of 3.4%.

In 2019, according to Eurostat data, the GDP produced at market prices per capita in the EU (28) is 31 960 compared to 30 980 Euros in 2018, an increase of 980 euros (3.16%). Excluding the United Kingdom, this indicator for the EU (27) is 31 090. **For the same period, Eurostat data for Bulgaria shows an annual increase of 700 Euros, GDP reaches 8 680 euros per capita with a growth of 8.77%.** Despite the higher growth rate, the difference in values increases. Our country remains the only country with a GDP of less than 10 thousand euros per capita. Romania is before us and since 2018 has crossed this threshold, for 2019 it reports 11 500 euros per capita - an increase of almost 10%. For all newly accepted countries in Central and South-Eastern Europe, excluding Slovenia and Estonia, the amount of this indicator is between 12 000 and 20 000 euros. Greece is also in this group. Only Luxembourg reports a value of above 100 000 euros, followed by Ireland with more than 70 000 euros per capita. In the member-states of Southern Europe, including France and Great Britain, the GDP is less than 40 000 euros per capita, and those of Northwestern Europe and Austria - over 40 000 euros / capita. There is a small decrease in this indicator only in Sweden and Iceland.

In terms of GDP per capita, but determined through Purchasing Power Standards (PPS), our country also lags behind the newly accepted CEE countries, but the values are above 50%. The latest Eurostat data for 2018 shows that in terms of purchasing power, GDP reaches 51% of the EU average (28), while in absolute terms it is only 27%. The closest is Romania, but with 66%.

The Gross Value Added (GVA) and the Gross Domestic Product (GDP) of Bulgaria for a period of four consecutive years, total and by economic activities are given in Table 1.4.

The preliminary NSI data published, indicate that for 2019 a GVA of 102 269 million leva, by 8 756 million leva more than in 2018, and the GDP is 118 669 million leva (+10 744 million leva).

Table 1.4

GDP and GVA by sectors and groups, BGN million

Indicators	2016	2017	2018	2019	
					%
Gross Value Added (GVA) – current prices, BGN million, incl.	79 937	87 634	93 513	102 269	86.2
- agriculture and forestry	3 519	4 114	3 937	3 790	3.2
- mining and processing industry, power generation, water and sanitation (B-E)	19 009	21 318	21 642	21 807	18.4
- construction (F)	3 388	3 606	3 996	4 661	3.9
-----	-----	-----	-----	-----	-----
- trade, food, transport and communications (G-J)	22 039	24 735	26 882	29 664	25.0
- finance, insurance, real estate and other business services (K,L,M,N)	18 806	19 964	21 805	24 147	20.4
- public administration, education, healthcare (O-Q), others (R-U)	13 175	13 898	15 250	18 200	15.3
=====	=====	=====	=====	=====	=====
- adjustments (taxes)	12 698	13 408	14 412	16 400	13.8
Gross Domestic Product (GDP), BGN million	92 635	101 042	107 925	118 669	100.0

*Source: NSI, *preliminary data*

The share of industry in GDP for 2019 is 18.4% compared to 20% in 2018, and in GVA - 21.3% (23% in 2018 and 24% in 2017). The decrease in this share is at the expense of higher value added growth in the services sector. The increase in value added in total in industry (industry and construction) is only 830 million leva, and the annual growth of the whole economy is 8 756 million leva. The growth for 2018 is lower - almost 4 000 million leva.

The analysis of the data shows that in Bulgarian economy the share of industry in GDP decreases every year and approaches the average level of the EU, which is in the range of 15-16%. This indicator is also formed as a result of the “leakage” of many production activities from developed EU countries to other regions, mainly to China.

Following the severe economic crisis due to the imposed measures against the epidemic impact of COVID 19 rethinking and change are expected of those policies that have led to Europe's heavy dependence on imports of goods, including vital products from third countries. If such a change occurs with the recovery of manufacturing activities, the share and contribution of real production to economy will be more significant.

Agriculture, after the reported growth in 2017, has been declining for the second year in a row and now reports a share of 3.2 % in the value added (compared to 4.3 %).

The largest increase of 3 billion leva is in the group of activities consisting of government, education and healthcare. Next, in terms of GVA growth, is the group of trade, transport, communications and informatics - an increase of 2.8 billion leva.

The real economy, which includes agriculture, mining and processing, energy and construction, creates its added value through processing chains to finished products and commodities. In recent years the relative share of this part of economy in the total growth and in the final indicators for the country has been decreasing at the expense of the activities in the service sector.

The values of the Gross Domestic Product (GDP) are formed by those of GVA plus tax adjustments. At comparable prices in 2019 compared to the previous NSI reports an annual rate of **change of GVA of 3.0% and GDP - 3.4% (3.1% for 2018)**.

Despite the declining relative share of industry in the country's GDP, it is a major factor for the growth of the entire economy, providing jobs and exports of goods. The data for 2018 by main sectors, which fall within the scope of the general Bulgarian industry are presented in Table 1.5. The indicators for the metallurgical industry as part of the processing industry of the country are also given.

In 2018, the country produced total industrial output is worth 77 091 million leva, by 2 324 million leva more than the previous year and a growth of 103.1%. The increased in production is less than in 2017, when it reached 8 393 million leva (an increase of 12.6%).

The data shows that 2017 as a development was better for business in the country. There was high growth in all sectors, especially in the manufacturing industry, incl. metallurgy. In 2018 there is a decline in the mining industry and energy sector.

Table 1.5

Industry, key economic indicators

CEA 2008 /INDICIES	2014	2015	2016	2017
INDUSTRIAL PRODUCTION, TOTAL	63 446	66 105	66 376	74 767
Mining /Sector B/				
- output produced, BGN million	2 433	2 435	2 496	2 852
- value added, BGN million	1 162	1 107	1 136	1 420
- employed, number	24 105	24 025	24 969	21 959
- value added/employee, BGN thousand	48.2	46.1	45.5	64.7
Processing industry /Sector C/				
- output produced, BGN million	54 354	54 773	62 623	65 631
- value added, BGN million	12 192	13 985	15 191	15 233
- employed, number	546 672	545 187	556 138	554 398
- value added /employee, BGN thousand	22.3	25.7	27.3	27.5
24. Production of basic metals				
- output produced, BGN million	7 412	6 780	9 559	10 195
- value added per employee, thousand BGN	56.8	66.3	81.7	69.9
incl. in the NF metallurgy, thousand BGN	119.9	123.6	145.3	109.8
Power generation /Sector D/				
-output produced, BGN million	7 899	7 627	7 739	7 003
- value added, BGN million	3 134	3 398	3 538	3 635
- employed, number	31 771	32 147	31 799	31 771
- value added /employee, BGN thousand	98.6	105.7	111.3	114.4
Water supply, sanitation, waste management /Sector E/				
- output produced, BGN million	1 417	1 480	1 553	1 697
- value added, BGN million	739	752	799	844
- employed, number	33 169	33 403	32 742	32 793
- value added /employee, BGN thousand	22.3	22.5	24.40	25.7

Source: NSI

Regarding the value added per employee, there is a decrease in the energy-intensive sectors - mining and metallurgy. In the energy sector, despite the reduced production, growth is reported. It is due to the increased prices of electricity, which in parallel leads to a decrease in the efficiency of large industrial consumers. For the first year, the energy sector reports a higher indicator than in non-ferrous metallurgy.

The manufacturing industry has the largest share of 85.1%, production of 65 631 million leva and growth of 4.8%. The share of metallurgy in the total production is 15.5% (the previous year 15.3%), and in the industrial production of the country - 13.2% (12.8% in 2017).

In 2018, metallurgy reported growth in higher value-added products, such as rolled ferrous metals and products and aluminum. However, there is a decrease in the total value added, as a result of a significant decrease in the non-ferrous metallurgy - by 24.5% (35.5 leva per employee). As the most energy-intensive sector, the relative share of electricity costs is high (up to 40%). Therefore, the increase in energy prices with falling metal prices on international markets has a strong negative impact on the efficiency and competitiveness of production. Despite these negative impact, the **value added per employee in the sector is higher than the average in the manufacturing industry - totally for the activity it is 2.5 times, only in the steel sector /RFM/ - 3 times, and for the non-ferrous metals – 4 times.** These indicators are one of the highest in the country, despite the sector is considered as low and medium efficiency production activity in the classification system.

1.3. ENERGY CONSUMPTION, FREIGHT TURNOVER

The metallurgical industry is a sector with high energy intensity and it is highly dependent on energy prices, mainly electricity and natural gas. It is also characterized by large in volume and weight raw materials for processing and finished products. This defines the metallurgical companies as one of the most important shippers in the country.

In the past 2019, the problems in the energy sector are being actively addressed in order to adopt legislative changes and an ordinance to compensate for the indirect costs of carbon emissions in electricity prices, according to the current EU State Aid Guidelines. Unfortunately, in the final stage of adoption by the National Assembly, this project was stopped. Thus, Bulgaria is the only country with a developed energy-intensive industry that does not use this support mechanism. Bulgarian metallurgy and other sectors operate in a non-competitive environment, compared to producers from other countries in the region and the EU. According to the EC for two years (2017-2018) the following compensations were received for indirect costs in member states: Germany – 2 582 million euro, Spain – 1 306 million euros, France - 883 million euro, Greece - 524 million .euro, Finland – 252 million euro, Slovakia - 230 million euro, Belgium - 180 million euros. The proposal not accepted by the Bulgarian National Assembly envisages annual compensation in the amount of 33 million leva or only 16.6 million euro.

In 2019, a notification from the EC was expected to reimburse the costs of preferentially purchased electricity from cogeneration. Unfortunately, this problem

did not find a solution. Our country was left with the most expensive electricity for industry on the EU energy map.

In the total energy balance of the country for 2018, the **final energy consumption in industry is 2 730.6 thousand tons of oil equivalent**, close to that in 2017 (consumption 2 721.3 thousand tons). **For industry alone (excluding construction) consumption is 2 664.6 thousand toe.**

Households report consumption of 2 229.7 thousand toe. The highest consumption is in transport – 3 372.7 thousand toe, and 90% of this expenditure is from oil and petroleum products. This identifies the sector as a major greenhouse gas pollutant, but with a high potential for transformation in meeting the objectives of the Green Deal and moving to low-carbon transport.

By types of energy resources, the highest relative share in the industry belongs to natural gas - 894.thousand toe, with a share of 32.8% (compared to 34% in 2017 and 35% in 2016). The consumption of electricity is 848.8 thousand toe, an increase of 40 toe. and with a share of 31% compared to 30% in the previous period. In recent years, electricity consumption has been increasing at the expense of reduced natural gas consumption. In total, electricity and natural gas account for 63.8%, and the remaining 36.2% are covered by other energy sources, such as solid and liquid fuels, heat and energy from waste incineration.

The total **energy consumption in metallurgy in 2018 is 303.5 thousand toe**, an **increase of 22.4 thousand toe, an increase of 8%**. After 2016, the consumption of energy resources in ferrous and non-ferrous metallurgy has been growing steadily, which is result of increased production of metals and metal products.

Energy consumption in ferrous metallurgy is 126.0 thousand toe, has a 41.5% share in total consumption and a growth of 6%. Non-ferrous metallurgy reported a total consumption of 177.5 thousand toe, it has a share of 58.5% and growth of 9.3%. This distribution reflects the specialization of the country in the production of non-ferrous metals and products out of them.

The metallurgical industry in 2018 is the largest consumer of electricity from all industrial sectors in the country - 160.6 thousand toe and this amount represents a 19.5% share of total industrial consumption. The next ones are the chemical and petrochemical industry (117.2 thousand toe); food, beverages and tobacco (114.7 thousand toe); mining industry (96.6 thousand toe).

The consumption of electricity in non-ferrous metallurgy is 90.3 thousand toe, with a share of 56% of consumption in the sector, and in ferrous metallurgy is 70.3 thousand toe (44%).

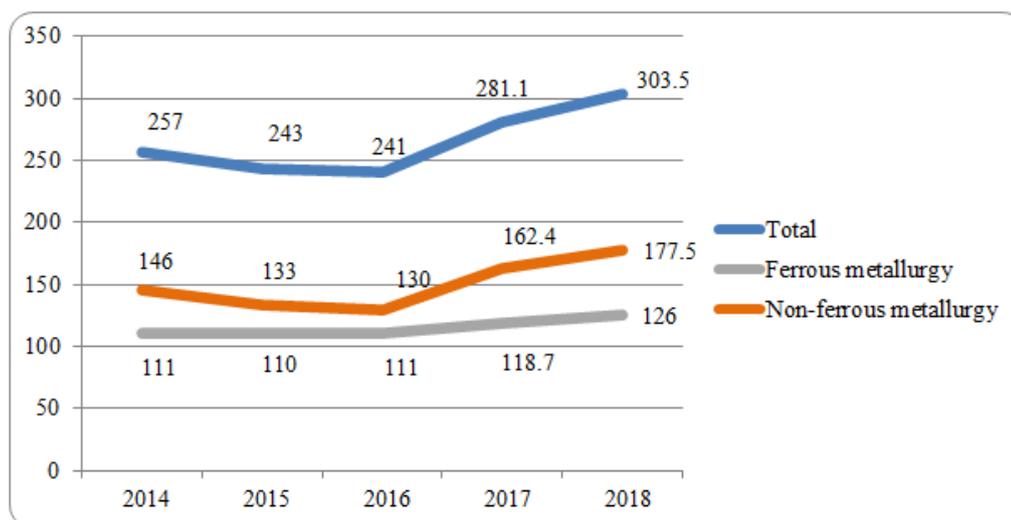
The consumption of **natural gas is 100.1 thousand toe** and reports an increase of 11%. **The share of metallurgy in the industrial consumption of natural gas is 12%** compared to 9.7% in 2017 and 8.8% in 2016. Ferrous metallurgy consumes larger quantities (55%) than non-ferrous (44%).

The chemical and petrochemical industry reduced the consumption of natural gas to 264.1 thousand toe (308 thousand tons for 2017) in 2018, so the first place went

to the producers of non-metallic minerals (glass, lime, firewood, cement) the consumption of which is 273.5 million tons, a share of 30.5%. **The metallurgical industry is in third place with a share of 11.2% in the total industrial consumption of natural gas.**

Figure 1.3 shows the dynamics of the energy consumption in total, and separately for ferrous and non-ferrous metallurgy for the last few years.

Figure 1.3



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

The total amount and structure of the energy resources used in metallurgy follows the development of the two main subsectors - ferrous and non-ferrous metallurgy. The commissioning of new capacities and the increased production of non-ferrous metals and alloys with further processing to final products leads to a higher growth in total energy consumption, with a higher share of electricity.

Metallurgy is one of the largest shippers in the country. For the transport of large quantities of raw materials and finished products being transported through the entire territory, land transport (rail, road) is used, and outside its territory also water transport.

The transport schemes in the mining metallurgy are carried out mainly by rail and road transport (for short distances or for precious metals).

The total cargo in the non-ferrous metallurgy is about 4 million tons, incl. about 1.8 million tons are bulk concentrates, 1.5 million tons of liquid cargo (sulfuric acid) and the rest are secondary metal raw materials and finished products of primary non-ferrous metals (650-700 thousand tons).

For enterprises that produce **finished rolled and pressed products from ferrous and non-ferrous metals and their alloys,** the quantities of transported goods are above 2.5 million tons per year.

The annual amount of freight generated by producers from the metallurgical industry reaches a total of 6.5 - 7 million tons and this creates thousands of jobs in transport sector.

1.4. FOREIGN TRADE EXCHANGE, IMPORT AND EXPORT

Bulgarian industry has an export orientation, a large part of the production is sold on world and European markets. In 2018 out of 77.1 billion total industrial output, the exports amounted to 56.0 billion leva, representing 73% and the total production and of which exports to EU countries was 37.7 billion leva, with a share of 67% (in 2017 - 66%).

In foreign trade there is a clear tendency for imports of goods to be higher than exports, which forms a constant negative trade balance. In 2019, goods were exported for 58.4 billion leva compared to the previous year –an increase of 4.3%, while imports amounted to 65.1 billion leva - an increase of 3.6%. Exports recorded higher growth and the negative balance decreased from 6.9 billion leva to 6.7 billion leva.

The data on the total value of imported and exported goods from the country in the last five years, including the foreign trade of metallurgical products are given in **Table 1.6**.

The main indicators for the country are based on the latest updated data of the NSI, and those for the metallurgical industry are from the official customs reports and data of the National Revenue Agency on imports and exports from the EU and third countries.

Detailed data on metal products by types, quantities and value are given in Section II, Tables 2.3 and 2.4 for ferrous metals and in Tables 3.13 and 3.14 of Section III for non-ferrous metals.

Table 1.6

Foreign trade balance in the goods exchange, billion leva

Indicators:	2015	2016	2017	2018	2019
Import of goods, incl. from the EU(28)	51.6 27.3	51.2 28.0	59.2 37.8	62.9 40.0	65.1 41.1
-----	-----	-----	-----	-----	-----
- basic metals and products relative share, %	3.5 6.8	3.6 7.0	4.2 7.1	4.3 6.8	4.5 7.0
Export of goods, incl. to the EU(28)	45.5 29.1	47.2 31.1	54.6 34.5	56.0 37.7	58.4 38.8
-----	-----	-----	-----	-----	-----
- basic metals and products relative share, %	6.1 13.2	6.3 13.4	9.3 17.8	7.8 14.1	6.7 11.5
Foreign trade balance, incl. - basic metals and products	-6.1 +2.6	-4.0 +2.8	-4.6 +5.1	-6.9 +3.5	-6.7 +2.2

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

According to preliminary NSI data, the largest trading partner for 2019 is the EU, with a total value of exports of 38.8 billion leva (64.4%), imports for 41.1 billion leva (63.1%) and a negative balance of -2.3 billion leva.

By country, the first place is occupied by Germany, from which we import goods for 7.9 billion leva and export for 8.6 billion leva. Metallurgy contributes to the large exports and the positive balance, with the exports of anode and cathode

copper. Of the EU countries, Romania is in second place in terms of foreign trade turnover and also with a positive balance - exports of 5.1 billion leva, imports of 4.7 billion leva. Italy is third in terms of trade, but with a negative balance - imports for 4.9 billion leva and exports for 4.3 billion leva. After them is Greece, from which in 2019 we imported goods for 3.0 billion leva and exported for 3.9 billion leva with a positive balance of 900 million leva.

The most important trade partner in exports from all third countries is Turkey, for which we exported goods worth 4.2 billion leva. Russia has the highest share in imports, with which we have the largest negative balance in the entire period and for 2019 it is -5.4 billion leva. It is due to the strong dependence of the country on the import of energy resources for the diversification of which still a solution hasn't been found.

The table confirms the high contribution of metals in the value of exported goods and the positive impact on the country's foreign trade balance. For 2019 they have an 11.5% relative share in the export of goods. As a commodity, apart from the physical volume of exported products, the value of metals on the world markets has a strong influence on the value. Despite the significant fluctuations in these prices, there is a constant tendency in the foreign trade metal turnover to form a positive balance ranging about several billion leva.

Data on exports of various types of goods, grouped by their main purpose for the last five years, according to BNB statistical information are given in Table 1.7.

Table 1.7

Foreign trade – export by goods groups, million euro

Groups goods	2015	2016	2017	2018	2019
Consumer goods, incl.	6096.0	6465.0	6848.9	7098.8	7582.8
- Foods	1332.0	1434.7	1649.2	1697.9	1788.2
- Cigarette	204.9	149.7	138.4	92.8	63.3
- Beverages	89.5	96.7	102.2	112.5	179.2
- Clothes and shoes	1582.7	1710.9	1661.4	1614.2	1620.0
- Pharmaceuticals and cosmetics	973.8	1007.4	1102.9	1092.8	1260.9
- Furniture nad home interior	990.3	1038.7	1086.7	1122.1	1227.1
- Other consumer goods	922.9	1026.9	1108.2	1255.1	1444.3
Raw materisl, incl.	9409.2	9393.7	10878.3	11382.5	11668.6
<i>Pig ireo, ireon and steel</i>	<i>411.8</i>	<i>402.6</i>	<i>536.2</i>	<i>676.3</i>	<i>608.1</i>
<i>Non-ferrous metals</i>	<i>2296.4</i>	<i>1808.0</i>	<i>2820.5</i>	<i>2758.9</i>	<i>2323.1</i>
Chemical products	379.3	325.5	421.7	459.4	493.9
Plastics, rubber	800.7	846.5	954.5	1005.6	1147.1
Fertilizers	244.0	220.1	214.0	189.7	236.1
Textiles	477.4	519.6	560.2	592.5	603.8
Raw materials for food production	1782.0	2064.0	1893.4	1960.2	2335.5
Wood and paper, cardboard	489.5	496.4	523.2	526.3	555.2
Cement	24.0	30.7	33.1	23.0	20.1
Tobacco	126.9	168.2	128.0	118.6	122.0
Other raw materials	2377.2	2512.1	2793.5	2919.4	3223.7
Investments goods, incl.	4880.9	5764.4	7023.2	7203.6	7266.4
- Machines, apparatus	1248.6	1334.3	1557.7	1670.7	1855.6
- Electrical machines	557.7	685.0	815.4	1029.4	1183.1
- Vehicles	473.4	516.5	635.2	579.2	651.0
- Spare parts and equipment	1270.7	1414.9	1573.5	1756.6	1850.7
- Other investments goods	1330.6	1813.7	2441.4	2134.8	1726.0
Total non-energy goods, incl.	20386.1	21623.2	24750.4	25686.9	25517.8
Total energy resources	2554.8	2456.0	3109.2	2901.5	3268.9
- Petroleum products	1903.6	1703.5	2258.9	2066.1	2345.6
- Other non-petroleum products	651.3	752.5	850.3	821.7	923.4
Incl. electricity	41.3	46.8	56.2	59.5	69.3
Total export	22982	24126	27916	28648	29856

Source: BNB

The values of the main three groups - consumer goods, raw materials and investment goods in all years are growing. Raw materials and materials have the largest share - 46% of non-energy goods. This group also includes metals. Most of this group of goods is produced by the manufacturing sectors, which occupy the middle part of the processing chains. Before them are the activities of extraction of natural resources, and after them is the production of consumer and investment goods. They are defined as low or medium value added activities.

Metallurgy is characterized by high specialization in the production of basic non-ferrous metals and alloys, products and articles thereof. They have established positions in European and world markets, with good quality and high

competitiveness. Due to their high price, the values of exported non-ferrous metals exceed almost three times those of ferrous metals. At the same time, they form a large positive foreign trade balance, both in value and in nature. Metallurgy in 2019 has a total positive balance of 2.2 billion leva.

A review of the data shows that the values of exports of goods other than metals over the years are maintained or gradually increasing. Only for metals large deviations are found, which is due to the strong dependence of exports on their prices on world markets. For 2019 there is a decrease in the total value of ferrous metals by 10% and non-ferrous metals by 16%. However, the BNB data also confirm those in Table 1.6 that **the share of basic ferrous and non-ferrous metal products in exports of goods is 11.5%**.

1.5. METALLURGICAL INDUSTRY IN THE EU AND IN BULGARIA

Modern world is unthinkable without metals, alloys and their products, which are an important raw material in the value chain in all industries and in everyday life. The changing economy, the increasing degree of digitalization and the transition to Industry 4.0 do not diminish the role of metals in this process and place ever higher demands on their quality characteristics. The realization of the European Green Deal is a new challenge for the raw materials industry, which, in addition to maintaining its position and leadership in world markets, must also respond to the increased consumption of metals. They are an important raw material for ecological transformation of sectors, such as "green" transport and "clean" mobility, energy production from renewable sources, energy storage and others. Given the high degree of low-carbon footprint recycling and the almost endless life cycle of metals, the circular economy and the efficient use of secondary resources are the focus of EU green policies.

The World Bank expects global demand for metals to increase during the climate transition period by 200% in wind turbines, 300% in solar panels and 1000% in batteries.

Asia, mainly China, is the largest producer of metals, with a share exceeding 50% of world production of steel, copper, zinc, lead. The European Union is still an important factor in world production, but it is threatened by "carbon leakage" and the transfer of capacity to third countries.

According to preliminary data from Eurostat for 2018, the EU (27) produced metallurgical products worth 357 billion euros and reported an increase of 6%, incl. in ferrous metallurgy of 10.5%, and in non-ferrous - 3.1%. The value of **Bulgarian production is 5.3 billion euros and a share of 1.5%. We rank 12th in terms of volume of metallurgical production among all the member states (13th and with a share of 1.4% in 2017).**

The largest producer of metals in the EU is **Germany - 104.6 billion euros** and a share of 30% in the total volume, followed by Italy with production of 60 billion

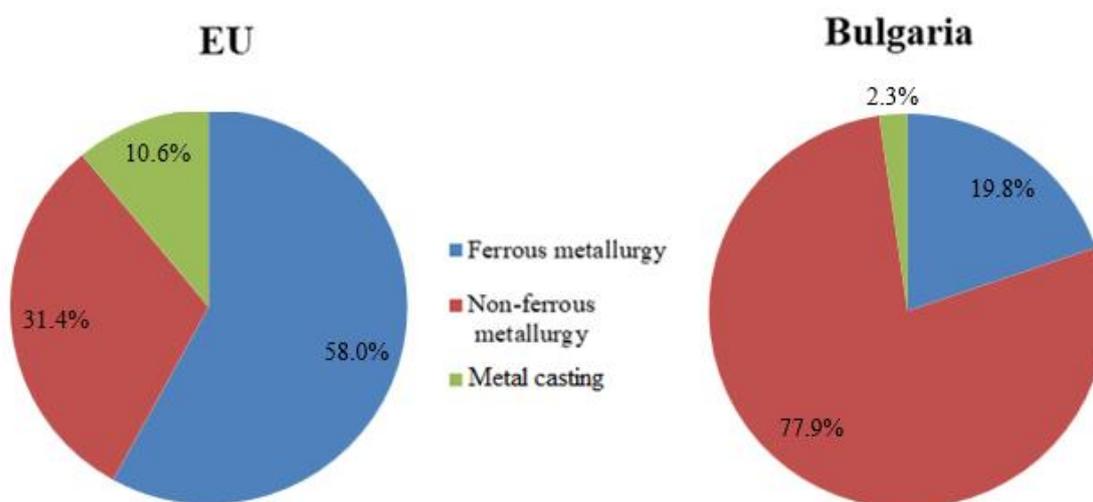
euros and a share of 17%. Other large producers with an equal share of 9% are France and Spain.

Among the CEE countries, the largest producer in 8th place is Poland - 14.6 billion euros, followed by the Czech Republic in 11th place (8.3 billion euros) and Bulgaria in 12th place. Unlike our country, which specializes in non-ferrous metallurgy, in these two countries ferrous metallurgy is prevailing. In recent years, we have been ahead of the producers close to us in terms of volume - Slovakia, Romania and Greece.

In 2018, the value of ferrous metals and rolled products produced in the EU (27) was 191 billion euros, non-ferrous metals - 112 billion euros and foundry products - 38 billion euros.

Figure 1.4 shows the ratio between these activities for the EU (27) and Bulgaria (preliminary EUROSTAT data for 2018).

Figure 1.4



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

In the structure of the EU metallurgical sector (27) in 2018 compared to the previous one the share of ferrous metallurgy increased from 57% to 58%, and of non-ferrous metallurgy decreased from 32% to 31.4% and of metal casting from 11% to 10.6% .

Metallurgy in Bulgaria is highly specialized in the production of non-ferrous metals and their products, which makes the ratio between ferrous and non-ferrous metallurgy very different from that of the EU. However, in 2018 the share of steel production in Bulgaria increased from 16.5% to 19.8%, at the expense of a decreasing share of non-ferrous metallurgy (from 82% to 77.9%) and metal casting.

This does not change the characteristics in terms of non-ferrous metallurgy and it will remain a leader in the coming years. The non-ferrous metals, alloys and products produced in Bulgaria in 2018 are worth 4.06 billion euros. This represents 3.6% of the total value of production in the EU (NACE Code 24.4-Manufacture of basic precious and other non-ferrous metals).

The main producers of non-ferrous metals are 12 Member States with values of their production for recent years as follows:

Country	value, billion euros		share, %
	2017	2018	
TOTAL EU (28), incl:	108.5	111.8	100.0
Germany	35.9	36.5	32.6
Italy	14.8	14.9	13.3
Spain	11.0	11.0	9.8
Belgium	8.8	8.7	7.8
France	7.4	8.1	7.2
Austria	5.0	5.7	5.1
Bulgaria	3.9	4.1	3.7
Sweden	4.3	4.1	3.7
Finland	2.7	3.2	2.9
Poland	2.9	3.1	2.8
Greece	2.7	2.8	2.5
The Netherlands	1.9	2.1	1.9
Other EU countries	7.2.	7.5	6.7

Source: Eurostat 06.2020

In 2018 Bulgaria ranked seventh in terms of the value of production of non-ferrous and precious metals in the European Union (27). Together with the United Kingdom we were in ninth place, but now we are ahead of Sweden and we are two positions ahead. In the other unspecified countries-producers of non-ferrous metals the annual production is around or below 1 billion leva.

The data show that the production of block metals (**copper, zinc, lead**) and **rolled non-ferrous metals and alloys in Bulgaria has a high contribution not only in the national economy, but also in the overall EU production.**

The volume of Bulgarian production in the total production of non-ferrous metals in the EU (28) for 2019 has a share of:

- 14% for anode copper (16.5% for 2018);
- 8% for electrolytic copper (8.5 for 2018);
- 6% in the total lead;
- 3.7% for zinc.

There is a decrease only in the production of anode and electrolytic copper, due to repair works performed in Aurubis Bulgaria AD.

For lead and zinc there is no change in the relative share of Bulgarian production in that of the EU (28). After the United Kingdom left the EU, this percentage will further increase.

SECTION TWO

FERROUS METALLURGY IN BULGARIA

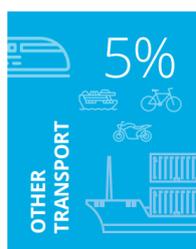
2.1 PRODUCTION OF FERROUS METALS AND ROLLED FERROUS METALS

2.1.1. STEEL PRODUCTION IN 2019 IN THE EU AND IN THE WORLD

Steel is a basic material in modern society. Together with products made of ferrous metal alloys it is extremely widely used in all spheres of human activity. The highest consumption is in road construction and infrastructure (52%), in mechanical engineering (16%) and automotive industry (12%), for the production of various types of metal products (10%).



At the same time steel is a metal with a truly endless life cycle - it can be recycled over and over again without losing its properties, making it key to the success of a circular economy.



All this makes production in this sector important for every country, regardless of its economic structure and development. Due to this fact, production is widespread in all regions and countries, which makes the sector highly sensitive to markets, fair competition and free trade rules. It is the focus of attention and protection of many governments around the world.



In 2019, the total world production of crude steel is 1 869 million tons - compared to the previous year there is an increase of 55 million tons. China remains the leading producer in 2019 with a 53% share of world production. Second in terms of volume of production is the EU (28) - 154.0 million tons, followed by India - 11.2 million tons, Japan - 99.3 million tons, the United States - 87.8 million tons and Russia 71.9 million tons.

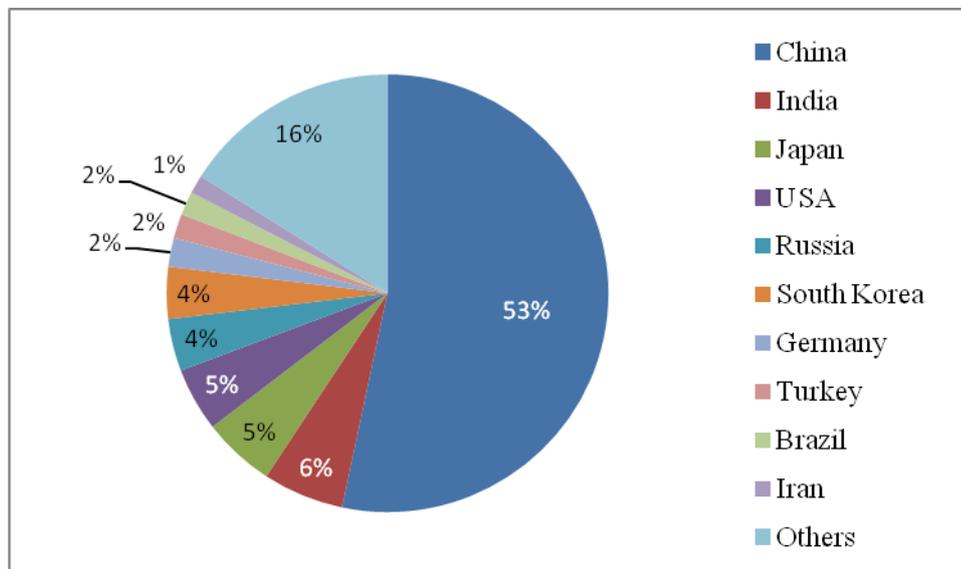
In Europe, apart from the EU (28), the largest producers are Russia - 71.9 million tons, Turkey - 33.7 million tons and Ukraine - 20.8 million tons.

The leading producers of crude steel for the last two years and their relative share of world production are given in the following table and in Fig. 2.1.

Crude steel producers, top 10 countries in the world

Country	Million tons		2019/2018 %
	2018	2019	
Chian	920.0	996.3	108.3
India	109.3	111.2	101.7
Japan	104.3	99.3	95.2
USA	86.6	87.8	101.4
Russia	72.1	71.9	99.7
South Korea	72.5	71.4	98.5
Germany	42.4	39.7	93.6
Turkey	37.3	33.7	90.3
Brazil	35.4	32.2	91.0
Iran	24.5	25.6	104.5

Fig. 2.1



Main world producers of crude steel, by countries, million tons, 2019

The world's largest steel producers – by company in 2019 are the following:

1. Arcelor Mittal – 97.3 million tons
2. China Baowu Group – 95.5 million tons
3. Nippon Steel Corporation – 51.7 million tons
4. HBIS Group – 46.6 million tons
5. POSCO – 43.1 million tons
6. Shagang Group – 41.1 million tons
7. Ansteel Group – 39.2 million tons
8. Jianlong Group – 31.2 million tons
9. Tata Steel – 30.2 million tons
10. Shougang Group – 29.3 million tons

Crude steel produced in the European Union in 2019 amounts to 158.8 million tons and compared to the previous year decreased by 8.9 million tons (5.3%). The largest producer of the member-states is Germany with 39.7 million tons of crude steel produced, but reporting a decline of 2.7 million tons. It is the only EU member-state in the group of top 10 producing countries (7th place). Apart from Germany, the other countries - large steel producers such as Italy, France, Spain, Poland also report a drop in the quantities produced.

The European steel industry is a world leader in innovation for sustainable and environmentally friendly development. It provides employment to about 320,000 highly qualified specialists and through them indirectly supports the jobs of more than 2.0 million people.

Among the member-states, the leading producers with a relatively high share of total crude steel production for 2019 are the following countries:

1. Germany – 25.0 % (39.7 million tons)
2. Italy – 14.6 % (23.2 million tons)
3. France – 9.1 % (14.4 million tons)
4. Spain – 8.6 % (13.6 million tons)
5. Poland – 5.7 % (9.0 million tons)
6. Belgium – 4.9 % (7.8 million tons)
7. Austria – 4.7% (7.4 million tons)
8. UK – 4.5% (7.2 million tons)

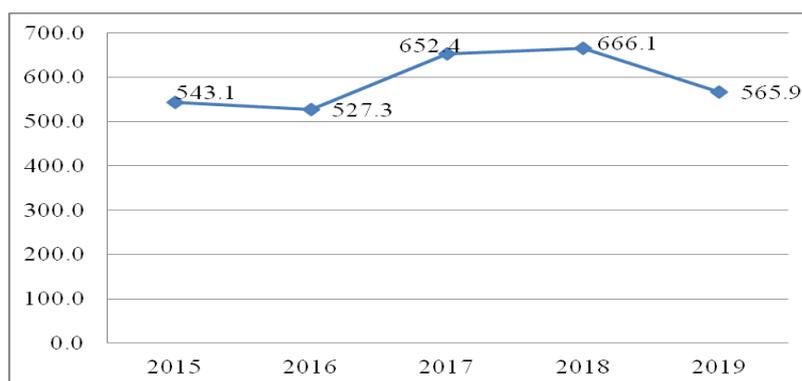
The closure of capacities for crude steel production in Bulgaria has put our country in the group of the small producers. The production in the two neighbouring countries – Romania and Greece is significantly higher - 3.4 million tons and 1.4 million tons respectively.

In 2019 Bulgaria's share of the EU crude steel production was 0.4 %.

2.1.2. CRUDE STEEL PRODUCTION IN BULGARIA

In Bulgaria the only producer of crude steel is “Stomana Industry“ JSC. The production is from secondary raw materials (scrap) melted in electric furnaces and it is considered green and low-carbon production. In 2019 the quantity of crude steel produced was 565.9 thousand tons – a decrease by 100.2 thousand tons (15%) or nearly three times higher than the average EU decrease - and this is ca.10 times more than the average decrease percentage in the EU (-5.3 %) (Fig. 2.2).

Figure 2.2



Crude steel production in Bulgaria, thousand tons

After the continuous casting, the produced crude steel is further processed in hot rolling mill for flat and long products as well as different types of articles from them. The investments made by Stomana Industry JSC exceed 20 million leva, the main projects including a line for additional processing of blanks, new filters for cleaning of technological and unorganized gases, reduction of emissions and fine dust particles, as well as expansion of the Facility for storage of hazardous and non-hazardous waste.

2.1.3. PRODUCTION OF ROLLED FERROUS METALS

Producers of rolled ferrous metals (RFM) in Bulgaria are “Stomana Industry“ JSC in Pernik and “Promet Steel“ JSC in Bourgas. The only producer of flat HR metals is “Stomana Industry“ JSC, and long HR metals are produced by the both companies.

In 2019 the total production of rolled ferrous metals (RFM) in the country was 968.1 thousand tons, compared to 2018 there is a decrease of 162.8 thousand tons or 14.5%. Of these quantities 726.0 thousand tons are long products with a share of 75% and 242.1 thousand tons of flat products, representing 25%.

In 2019 the production of both flat and long products decreased by 30.9 thousand tons and 131.9 thousand tons respectively compared to 2018.

Production data is given in Table 2.1 and Fig. 2.3

Table 2.1

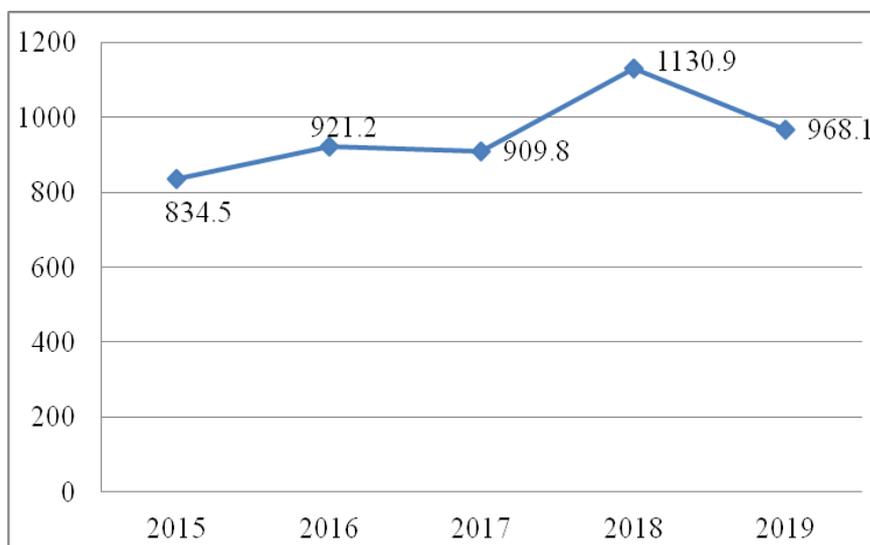
Production of rolled ferrous metals (RFM) by assortment, thousand tons

Types of RFM	Company	2015	2016	2017	2018	2019	2019/18 +/-	2019/18 %
RF long	Promet Steel JSC	329.1	417.1	262.9	458.6	428.9	-29.7	93.5
	Stomana Industry JSC	292.5	322.0	383.0	399.3	297.1	-102.2	74.4
	Total	621.6	739.1	645.9	857.9	726.0	-131.9	84.6
HR flat	Stomana Industry JSC	212.9	182.1	263.9	273.0	242.1	-30.9	88.7
HR metals total	Promet Steel JSC	329.1	417.1	262.9	458.6	428.9	-29.7	93.5
	Stomana Industry JSC	505.4	504.1	646.9	672.3	539.2	-133.1	80.2
Total		834.5	921.2	909.8	1130.9	968.1	-162.8	85.6

Source: Company data

Both companies- producers of long products - Stomana Industry JSC and Promet Steel JSC - report a decrease in production in 2019, respectively by 102.2 and 29.7 thousand tons. The drop in Stomana Industry JSC is more significant - by 25.6%. In the flat products (Stomana Industry JSC) there is also a decrease in the produced quantities compared to 2018 - by 30.9 thousand tons less in 2019.

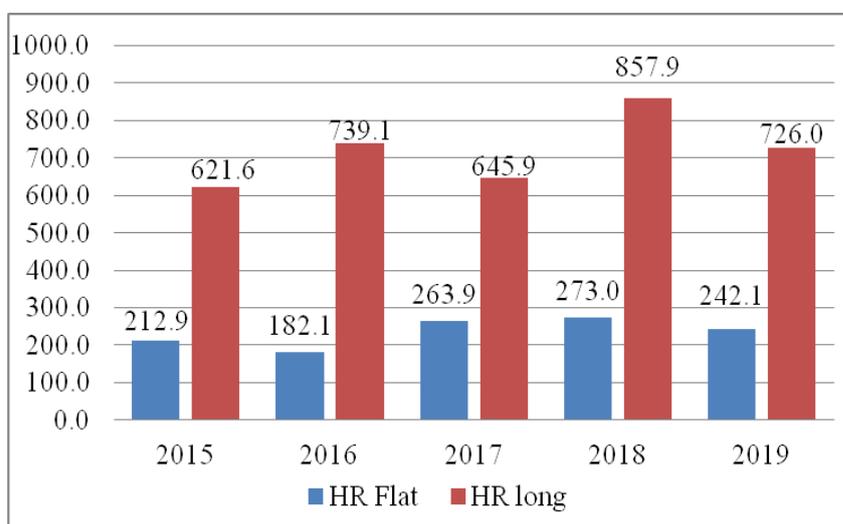
Fig. 2.3



Production of flat and long rolled metals, thousand tons

Figure 2.4 shows the quantities of long and flat rolled metals produced in the country over a five years period.

Figure 2.4



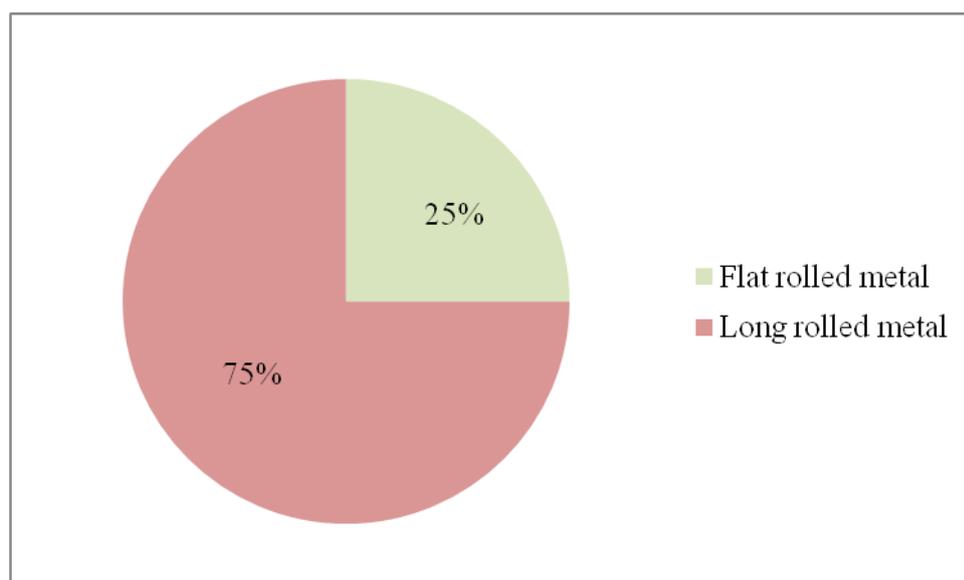
Production of flat and long rolled metals, thousand tons

It is obvious that traditionally the production of a long HR metals exceeds that of the flat HR metals (2 to 3 times), which corresponds to the existing capacities in the country.

Even in the “Stomana Industry“ JSC, where both long and flat HR metals are produced, the production of long exceeds that of the flat HR metals.

The ratio between the two types of HR products for 2019 is shown in Figure 2.5.

Figure 2.5



Production of flat and long rolled metals, 2019, %

2.1.4. PRODUCTION OF ROLLED FERROUS METAL ARTICLES

Finished products from rolled ferrous metal are the next products in the value chain. In Bulgaria they are produced from raw materials from Bulgarian metallurgical companies or from imports (sheets, strips, wire rod). Their production by the member companies of BAMI in 2019 increased by 2.4% compared to 2018.

Table 2.2

Production of RFM articles by companies, thousand tons

Articles	Company	2015	2016	2017	2018	2019	2019/18 +/-	2019/18 %
Steel pipes, welded	“EMC Distribution” JSC	48.0	50.8	33.1	42.6	43.3	0.7	101.6
Steel balls for mills	“El Stomana” JSC	29.4	19.9	14.4	21.5	22.0	0.5	102.3
Wire and wire articles	“ZHITI” JSC	12.0	13.1	14.5	10.4	11.0	0.6	105.8
Total RFM articles		89.4	83.8	62.0	74.5	76.3	1.8	102.4

Source: Company data

The data given on the production of RFM finished products cover only BAMI member-companies. There are other manufacturers of welded pipes and various types of steel products in the country.

Steel balls are produced by El Stomana OOD, using the capacities and metal billets from Stomana Industry JSC.

The largest company for wire and wire products is JITI AD, Ruse.

Fig. 2.6

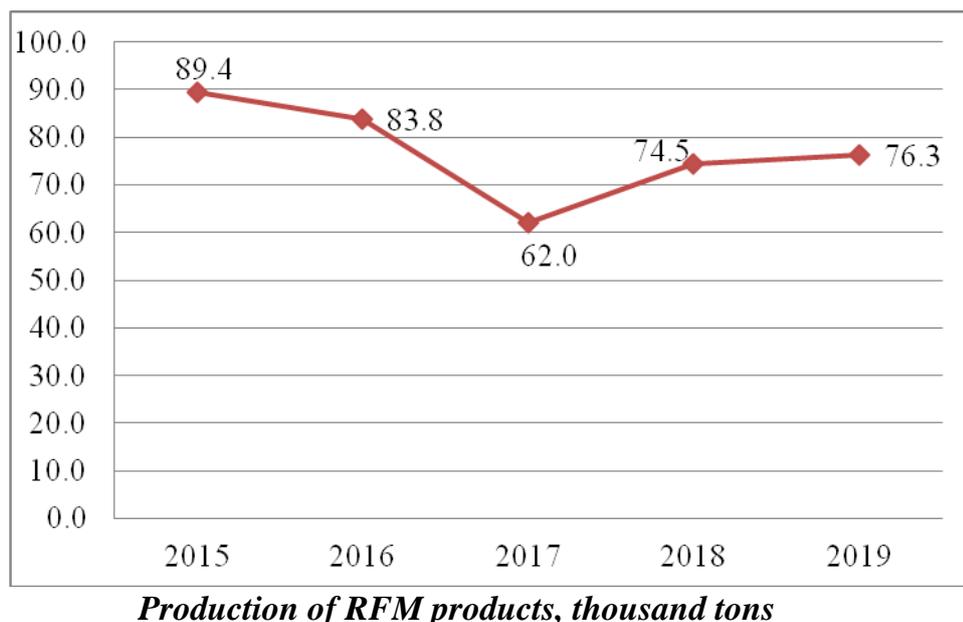


Figure 2.6 presents the quantities of steel articles produced by BAMI members-companies during the last five years. The largest share belongs to the steel welded pipes, produced by EMC Distribution JSC – 57 %.

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

2.2.1. IMPORT OF SCRAP, RFM AND PRODUCTS

In 2019 the total quantity of imported rolled ferrous metals (RFM) and products from them, including scrap is **2 342.0 thousand tons**. Compared to 2018, they are 262.6 thousand tons more (12.6% increase).

Data on the quantities of imports by commodity groups is given in Table. 2.3. **Imported metal products in 2019 amounted to a total of 2 798.0 million leva, which is 464.7 million leva more than the previous year or 19.9% growth.**

Table 2.3

Import of ferrous metals and products of them, thousand tons

Goods	2015	2016	2017	2018	2019	2019/18 +/-	2019/18 %
Non-alloyed - total	1 455.2	1 545.2	1 506.6	1 735.0	1 805.4	70.4	104.1
Pig iron - ingots, granules, powder	19.7	15.2	16.8	15.7	15.1	-0.6	96.2
Ferroalloys	13.8	11.4	15.7	15.5	16.5	1.0	106.5
Scrap	105.2	94.5	101.3	166.0	224.0	58.0	134.9
Semi-finished products	372.8	482.4	367.6	540.1	474.6	-65.5	87.9
HR metal (coil and sheet)	492.2	511.0	509.8	494.6	546.0	51.4	110.4
CR metal (coil and sheet)	122.0	122.1	135.4	121.7	112.2	-9.5	92.2
Rolled wire	118.2	120.5	126.8	171.6	194.2	22.6	113.2
Bars	141.0	113.9	157.5	120.5	143.2	22.7	118.8
Profiles	70.3	74.2	75.7	89.3	79.6	-9.7	89.1
Alloyed - total	72.2	83.9	94.6	64.8	97.4	32.6	150.3
HR and CR coils and sheets	39.8	43.5	54.1	28.0	63.2	35.2	225.7
Bars and profiles	32.4	40.4	40.5	36.8	37.9	1.1	103.0
RFM products	322.7	447.7	298.4	279.6	435.5	155.9	155.8
Seamless pipes	28.2	33.8	36.5	41.7	30.1	-11.6	72.2
Welded pipes	112.5	218.1	46.8	34.0	190.3	156.3	559.7
Coated sheets	154.1	168.3	190.8	185.9	188.7	2.8	101.5
Wires, ropes etc.	27.9	27.5	24.3	18.0	26.4	8.4	146.7
Total:	1 850.1	2 076.8	1 899.6	2 079.4	2 342.0	262.6	112.6
Value, EUR million	9 85.1	1 080.2	1 143.1	1 193.0	1 430.6	237.6	119.9
Value, BGN million	1 926.7	2 112.7	2 235.5	2 333.3	2 798.0	464.7	119.9

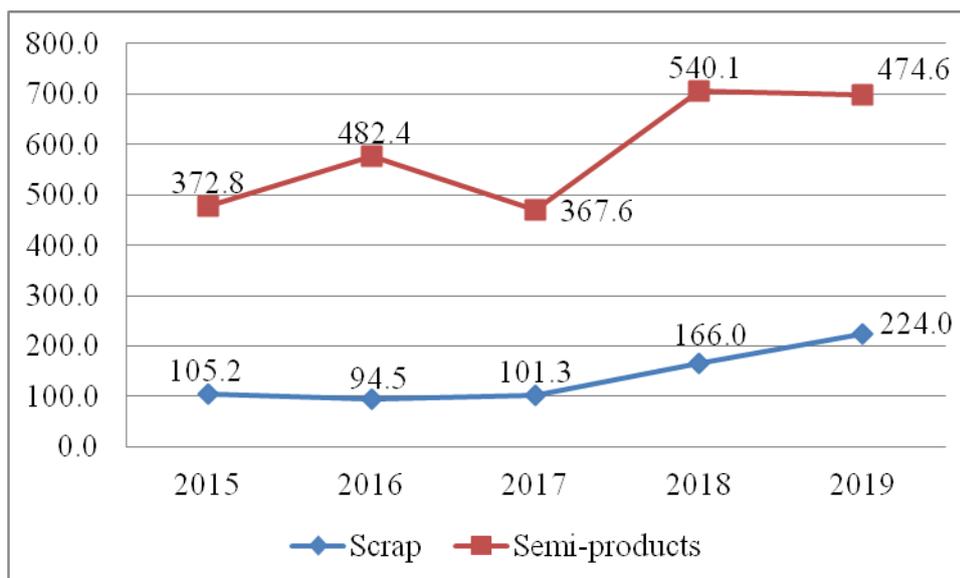
Source: Customs statistics, NRA

Based on the import data by product group, the following conclusions can be made:

→ 224.0 thousand tons of ferrous **scrap** were imported as a raw material for the production of crude steel in 2019. Compared to 2018, there is an increase of 58.0 thousand tons (34.9%). This growth compensates for the reduced supplies from the country. Romania and Serbia are the countries from which ferrous scrap is traditionally supplied (Romania - 81% of imports and Serbia - 15%), and there are also small quantities imported from Russia (2.7%) and Greece (1.1%).

→ The import of **semi-finished products** for Promet Steel JSC decreases in accordance with the reduced production of long products in the company. More than 90% of the raw materials are imported from Ukraine, the sources being steel companies, part of the Metinvest holding group, which also owns Promet Steel in Bulgaria. 8.2% of the import of semi-finished products is from Greece, there are minimal quantities imported from Spain, Germany and Russia.

Fig. 2.7

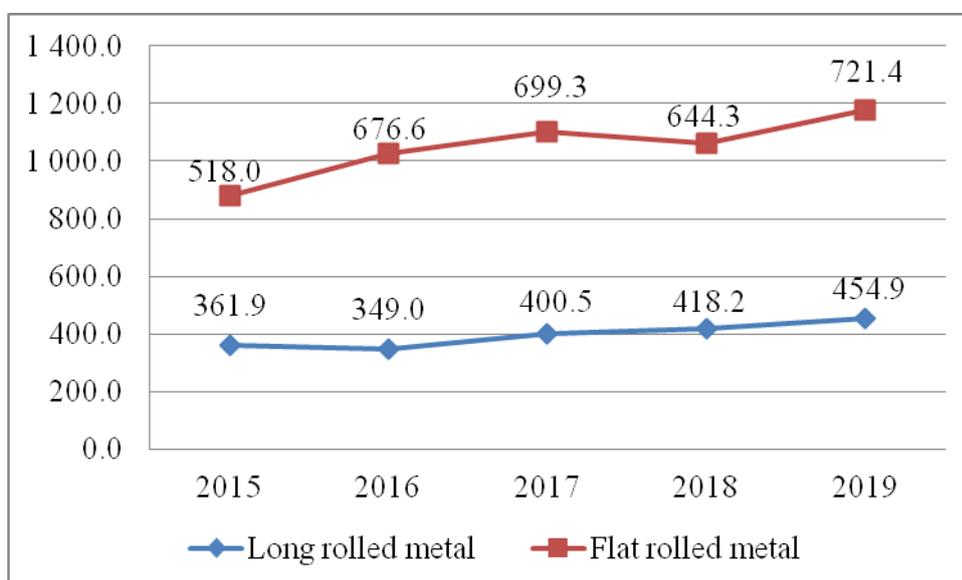


Import of scrap and semi-finished products, thousand tons

Fig.2.7 shows the trend in the import of scrap and semi-finished products for ferrous metallurgy in the country during the last five years. After being further processed into products with new added value, they are sold on the domestic market and for export.

Fig. 2.8 shows the import of flat and long rolled products for the period 2015-2019.

Fig. 2.8



Import of flat and long rolled metal, thousand tons

In 2019 totally 721.4 thousand tons of flat HR and CR metal from common grades and alloyed steel were imported, reporting an increase of 77.1 thousand tons compared to 2018. The amount of non-alloy HR products - coils and sheet is 546.0 thousand tons, they are the largest commodity group of all imports of ferrous metals, imports in 2019 are the highest in the last five years - with over 10%

growth compared to 2018. The main countries from which these products are imported in 2019. are Serbia (39%), Turkey (29%) and Romania (19%).

Flat SV rolled products are not produced in the country, but imports are relatively smaller - about 112 thousand tons in 2019.

The quantity of non-alloyed **HR products - rolls and sheets is 546.0 thousand tons**, they are the largest commodity group of all imports of ferrous metals, imports in 2019 are the highest in the last five years - with over 10% growth compared to 2018. The main countries from which these products are imported in 2019 are Serbia (39%), Turkey (29%) and Romania (19%).

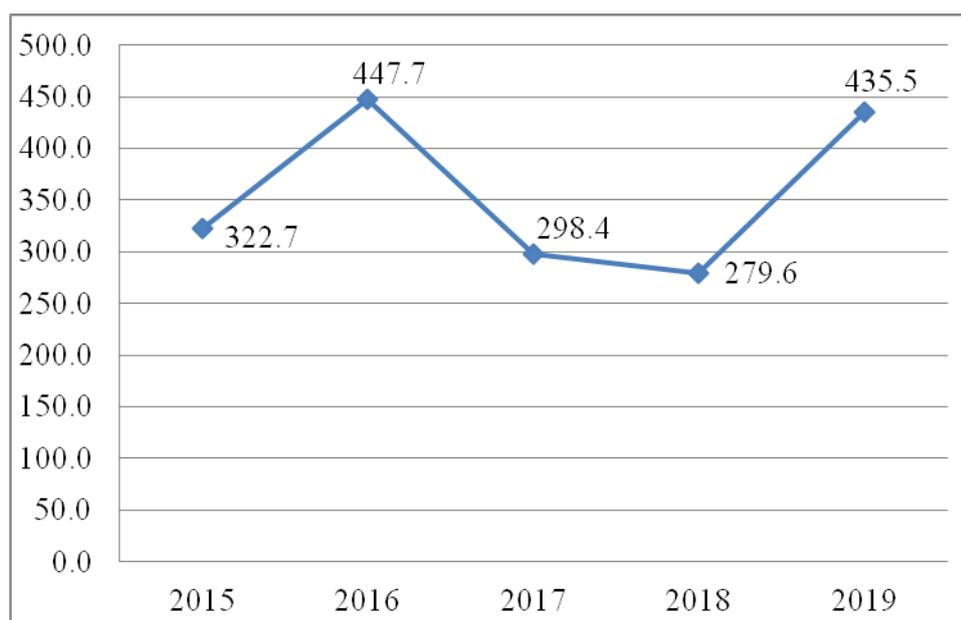
Flat CR products are not produced in the country, but import is relatively smaller - about 112 thousand tons in 2019.

The total import of **long rolled products** in 2019 from common grades and alloy steel is 454.9 thousand tons, 36.7 thousand tons more than the previous year. The total import of non-alloyed steel bars and profiles is 222.8 thousand tons, maintaining the levels of recent years. The import of rods increased by 22.7 thousand tons and that of profiles decrease by 9.7, a total increase of 13.0 thousand tons compared to 2018.

Long products are imported mainly from Turkey (30%), Ukraine (20%) and Greece (19%).

The finished products of rolled ferrous metals imported in 2019 are totally 435.5 thousand tons, an increase of 56% or 155.9 thousand tons more than the quantities imported in 2018. This large increase is entirely due to increased imports of pipes (156.3 thousand tons more than in 2018). Fig. 2.9 shows the quantities for the period 2015-2019.

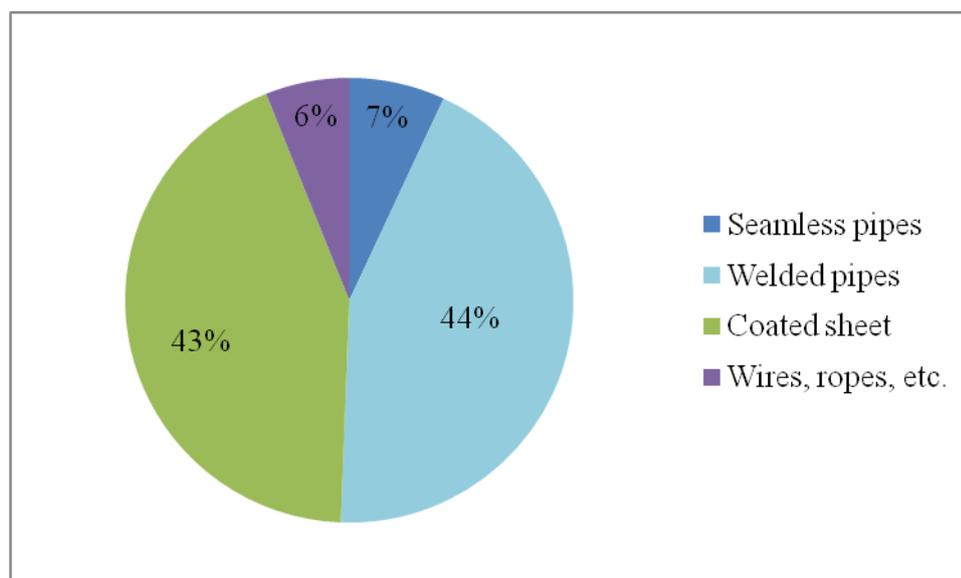
Fig. 2.9



Import of RFM finished products, thousand tons

The structure of import of metal finished products in 2019 is given on Figure 2.10.

Fig. 2.10



Import of RFM finished products, by type, 2019

The ratio between different products corresponds to traditional imports in accordance with industry needs. Those products that are not produced in the country (or are produced, but in smaller quantities) are predominant - coated sheets (43%) and pipes (51%).

2.2.2. EXPORT OF SCRAP, RFM AND PRODUCTS

Data on the export of the basic ferrous metals and finished products for the last five years and the changes in 2019 compared to 2018 are given on Table 2.4.

The total amount of metal raw materials exported in 2019 (ingots, scrap, semi-finished products), as well as rolled ferrous metals and finished products form them is 1 511.2 thousand tons. The quantity remains at the 2018 level – it drops by only 14.6 thousand tons (1%).

The export of scrap in 2019 reached 438.3 thousand tons, its highest level for the last five years; the increase compared to 2018 is by 57.3 thousand tons (15%).

Bulgarian producers of long products (rods, profiles, reinforcing bars) reported a decline in exports of 150 thousand tons (23%) during the year. Apart from scrap, an increase in exports was also observed in RFM finished products (13.5%), in particular welded pipes. The main part of the products from RFM are not manufactured by Bulgarian producers, such as rolled products and products from alloyed steel, seamless pipes, coated sheets and others.

In terms of value, the export of ferrous metals in 2019 is 1 545.3 million leva or a decrease of 56.7 million leva (3.5%) compared to 2018.

Table 2.4

Export of ferrous metals and products, thousand tons

Goods	2015	2016	2017	2018	2019	2019/18 +/-	2019/18 %
Non-alloyed - total	937.5	1 007.20	1 123.90	1190.7	1 141.0	-49.7	95.8
Pig iron - ingots, granules, powder	0.8	26.2	8.2	6.3	5.5	-0.8	87.3
Ferroalloys	2.4	1.3	1.8	3.6	5.3	1.7	147.2
Scrap	239.7	241	398.9	381	438.3	57.3	115.0
Semi-finished products	2.3	4.6	2	0.2	7.3	7.1	3650.0
HR metal (coil and sheet)	240.5	208.6	275.5	259.6	227.6	-32.0	87.7
CR metal (coil and sheet)	16.9	17	12.7	10	7.8	-2.2	78.0
Rolled wire	27.5	15.7	9.3	2.4	2.3	-0.1	95.8
Bars	371.7	457.5	378.6	490.8	404.9	-85.9	82.5
Profiles	35.7	35.3	36.9	36.8	42	5.2	114.1
Alloyed - total	48.6	52.6	56.3	65.1	63.7	-1.4	97.8
HR and CR coils and sheets	2.8	4.5	5.2	0.6	11.4	10.8	1900.0
Bars and profiles	45.8	48.1	51.1	64.5	52.3	-12.2	81.1
RFM products	182.2	252.6	557.5	270.0	306.5	36.5	113.5
Seamless pipes	1.8	2.5	3.1	2.7	2.5	-0.2	92.6
Welded pipes	168.8	224.8	519.7	232.8	264.9	32.1	113.8
Coated sheets	6.2	11.4	13.6	11.5	13.6	2.1	118.3
Wires, ropes etc.	5.4	13.9	21.1	23.0	25.5	2.5	110.9
Total:	1 168.30	1 312.40	1 737.70	1 525.80	1 511.2	-14.6	99.0
Value, EUR million	503.6	527.3	1 015.50	819.1	790.1	-29.0	96.5
Value, BGN million	985	1 031.20	1 986.20	1602	1545.3	-56.7	96.5

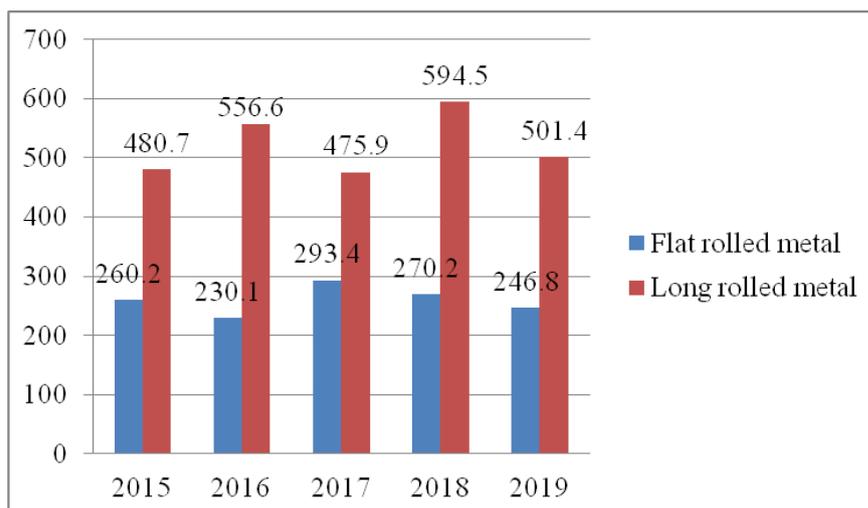
Source: Customs statistics, NRA

The export of flat and long rolled products, including alloyed for the period 2015-2019, is given on Fig. 2.11.

During the last year 246.8 thousand tons of flat products were exported, with 23.4 thousand tons less than in 2018.

The main destinations for export of flat non-alloyed products in 2019 correspond to the previous few years. In 2019, exports are distributed between the countries as follows: Turkey (20%), Romania (15%) and Hungary (9%), Germany, Algeria and Greece, Mexico having smaller shares.

Fig. 2.11



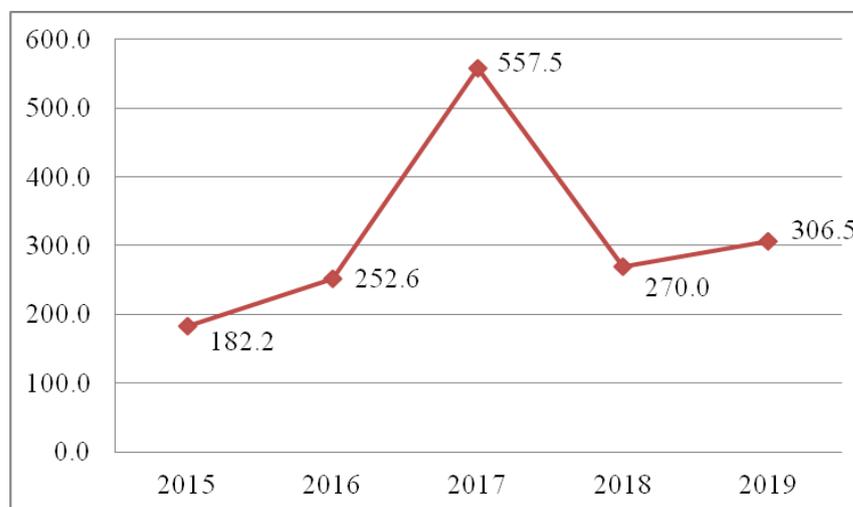
Export of flat and long RFM, thousand tons

The export of **long rolled products** - steel rods and profiles is 501.4 thousand tons in 2019. Compared to the previous year, a decrease of 93.1 thousand tons or above 15% is reported. **The export of non-alloyed steel bars, which are the main production of Bulgarian steel companies, is 404.9 thousand tons. Compared to the previous year it decreased by 85.9 thousand tons.** The largest quantity is for Romania - 59% of total exports, followed by the United States with 10%, Hungary - 5%. Smaller quantities were sold in neighboring countries - Macedonia, Serbia, Greece, as well as Italy and France.

The export of **non-alloyed steel profiles** is relatively constant in quantity, with a slight increase in 2019 compared to 2018 - by 5.2 thousand tons. The main destinations for these products in 2019 are Ukraine (28%) and Russia 21%), as well as neighboring countries - Greece, Romania, Macedonia, Serbia - a total share of 38% of the exports.

The export of metal products does not characterize the production of Bulgarian companies, as it is influenced by the import and export of gas pipes under infrastructure projects.

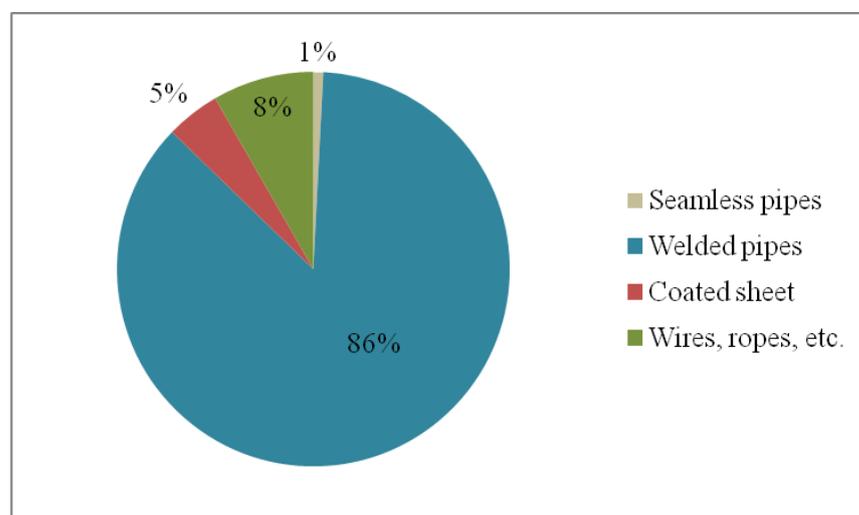
Fig. 2.12



Export of metal products, thousand tons

Fig. 2.13 illustrates the distribution of export by main the product groups in 2019. The share of the welded pipes is 86 % , this ratio has been stable over the years and shows the good export potential of the welded pipes produced in the country.

Fig. 2.13



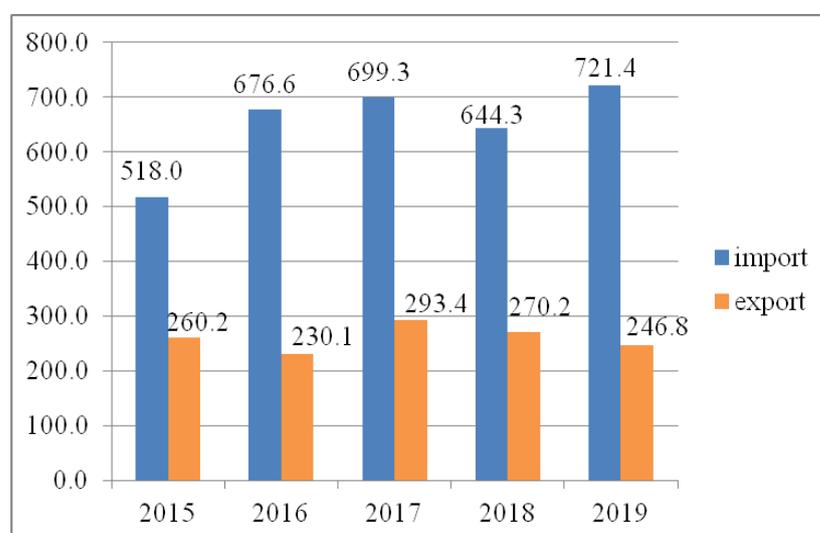
Export of metal products from RFM, 2019

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

The data on exported and imported ferrous metal products characterizes the sector as a net importer, with a negative foreign trade balance.

The import and export of **flat rolled products** for the period 2015 - 2019 is shown in Fig. 2.14. For the last year an increase in the total trade turnover by 53.7 thousand tons is reported. The whole period is characterized by much higher imports compared to exports, as for 2019 the difference is almost 3 times due to a decrease in exports and an increase in imports in the year compared to 2018, which for the last five years reaches 40% .

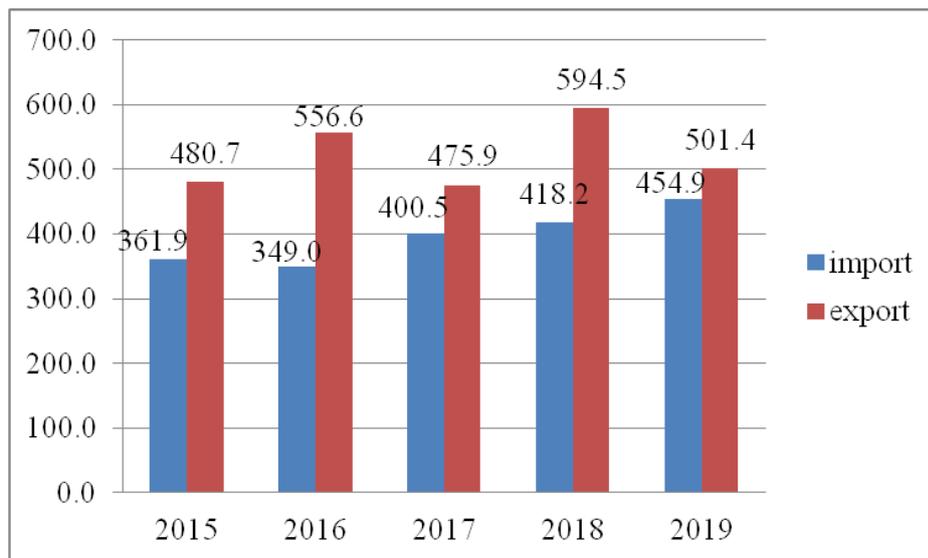
Fig. 2.14



Import and export of flat RFM, thousand tons

For **long products** (Fig.2.15) the trend is reversed: exports are higher than imports, but in 2019 the difference decreases. Given the capacity to produce long products, the country has the potential to reduce imports, although in recent years it has shown an upward trend. Totally, for the period the import of long products reported an increase of 26%. Exports reported a decrease of 93.1 thousand tons (15.7%) and imports - an increase of 36.7 thousand tons. However, in 2019 compared to 2018 there is a positive balance of 46.5 thousand tons, compared to 176.3 thousand tons in 2018.

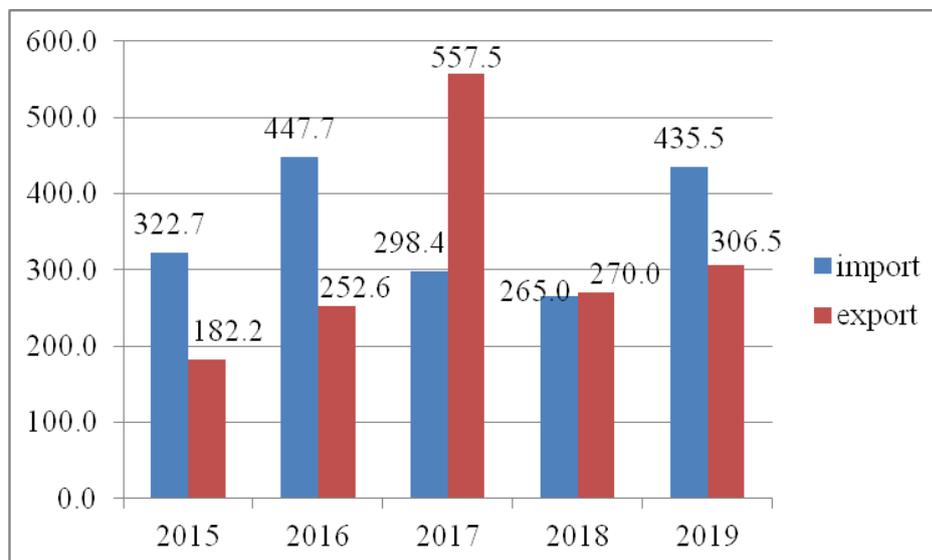
Fig. 2.15



Import and export of long products, thousand tons

Traditionally, the import of finished products exceeds the export 1.5 - 2 times. This is also the case in 2019, and the data for the last five years, given on Fig.2.16, show the influence of the welded gas pipes in the overall trade balance for the indicated period.

Fig. 2.16



Import and export of RFM finished products, thousand tons

The aggregated balance between the import and the export of all raw materials, ferrous metals products and articles given in Table 2.5 shows that for 2019 a **negative trade balance of 810.1 thousand tons is formed. Compared to the previous 2018, the difference in favor of imports increased by another 243.4 thousand tons.**

Table 2.5

Foreign trade balance of ferrous metals in 2019

Production:	Export, thousand tons	Import, thousand tons	Difference
Semi-finished products	7.3	474.6	-467.3
Flat RFM	246.8	721.4	-474.6
Long RFM	501.4	454.9	46.5
Finished products	306.5	435.5	-129.0
Scrap	438.3	224.0	214.3
Total	1500.3	2310.4	-810.1

Source: Customs statistics, NRA

The data by product groups for 2019 shows the following:

- **semi-finished products** - for this group every year the foreign trade balance is negative. Bulgaria is a net importer of semis - raw materials for further processing along the value chain in the metal industry;

- **flat rolled products** - for this group the country is also a net importer, the import exceeds the export by 474.6 thousand tons;

- **long rolled products** - exports are higher than imports, the positive balance in nature is 46.5 thousand tons with a tendency to decrease;

- **scrap** - every year exports exceed imports, respectively by 214.3 thousand tons last year;

- **RFM finished products** - the balance is again negative - imports are by 129.0 thousand tons higher than exports. Gas projects have an impact.

Data on the foreign trade turnover in nature of only rolled ferrous metals and finished products is given in Table 2.6. The influence of the following goods: pig iron, ferroalloys and scrap, which are not part of the production of the metallurgical industry is removed.

Table 2.6

Foreign trade turnover of RFM and finished products, thousand tons

Products and articles of RFM	2015	2016	2017	2018	2019	2019/18 +/-	2019/18 %
Rolled ferrous metals							
- import (incl. semis)	1 388.7	1 508.0	1 765.8	1 565.8	1 650.9	85.1	105.4
- export (incl. semis)	743.2	791.3	769.0	799.8	755.5	-44.3	94.5
Turnover total	2 131.9	2 299.3	2 534.8	2 365.6	2 406.4	40.8	101.7
Balance (Export-Import)	-645.5	-716.7	-996.8	-766.0	-895.4	-129.4	116.9
RFM finished products							
- import (incl. semis)	322.7	447.7	298.4	265.0	435.5	170.5	164.3
- export (incl. semis)	182.2	252.6	557.5	247.2	306.5	59.3	124.0
Turnover total	504.9	700.3	855.9	512.2	742.0	229.8	144.9
Balance (Export-Import)	-140.5	-195.1	259.1	-17.8	-129.0	-111.2	724.7

Source: Customs statistic, NRA

The total turnover of **ferrous metals**, including semis for 2019 is 2 406.4 thousand tons - by 40.8 thousand tons more than in 2018. The negative balance increased and reached 895.4 thousand tons, which is due to increased import and reduced export.

The trade turnover of **RFM finished products** in 2019 is 742.0 thousand tons, increasing by 229.8 thousand tons compared to the previous year. For 2019 in this commodity group there is growth both in import and export, but the trade balance remains negative - 129.0 thousand tons.

2.2.4. SALES OF RFM AND FINISHED PRODUCTS

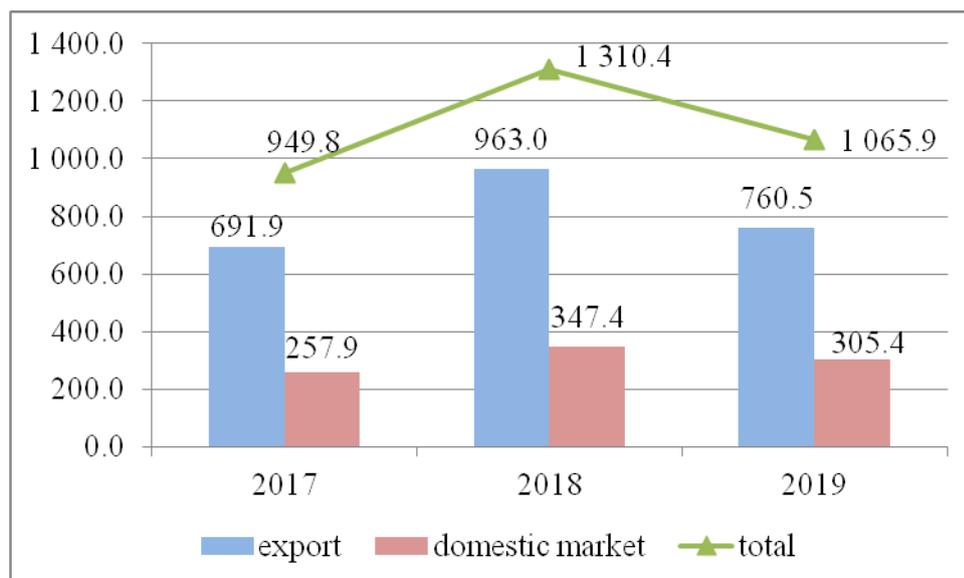
This chapter presents data on the total sales of metallurgical production by the companies members of BAMI, incl. data on the domestic market sales and export by types/product groups. These indicators are relevant for determining the real domestic consumption in the respective period.

In 2019 the **sales on the Bulgarian market** made by Bulgarian producers of ferrous metals and products amount to 305.4 thousand tons, a decrease of 42.0 thousand tons (12%) is reported compared to the previous year.

The **export** also goes down compared to 2018 - by 202.5 thousand tons and the total trade turnover of Bulgarian companies in 2019 is 1065.9 thousand tons. (Fig.2.17).

The **total sales of RFM and finished products** from them decreases by 244.5 thousand tons in 2019.

Fig. 2.17



Sales of RFM and finished products, 2017-2019*

* Company data

Table 2.7 provides data on the sales of flat and long products in 2019. Compared to the previous year, a decrease of 240.4 thousand tons in the quantities, or almost 20% drop, is reported.

Table 2.7

Sales of rolled ferrous metals (RFM), thousand tons

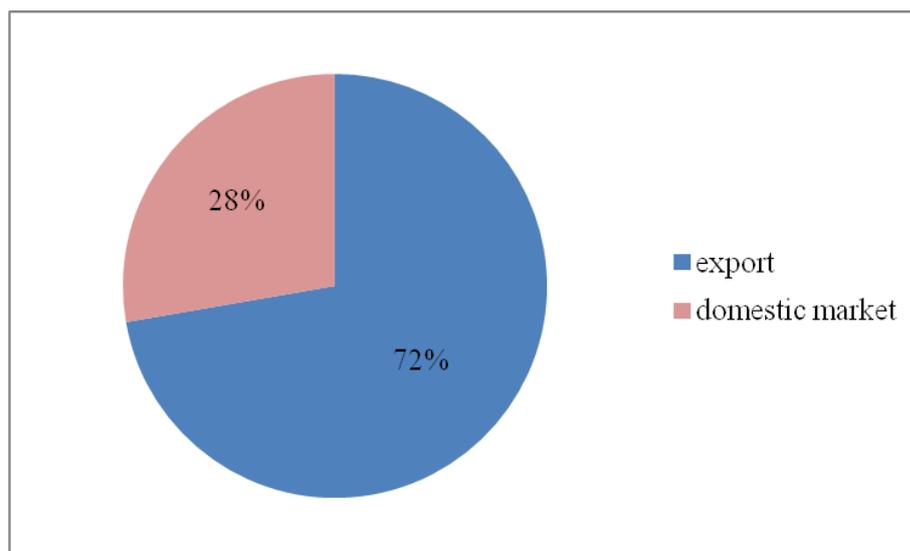
Production	Export		Domestic sales		Total sales	
	2018	2019	2018	2019	2018	2019
Long RFM	642.4	492.5	270.1	241.0	912.5	733.5
Flat RFM	269.5	216.9	40.6	31.8	310.1	248.7
RFM total	911.9	709.4	310.7	272.8	1 222.6	982.2

Source: Company data

The rolled ferrous metals, products and finished products, made in the country are sold mainly on foreign markets. The liberal trade policy and free market for these goods, both within the EU, in the region and globally create a highly competitive environment and producers often face unfair imports from third countries. This is an obstacle both to the realization of larger quantities on the internal market and on the EU markets.

In 2019 the export / domestic market ratio for the main metallurgical products (flat and long rolled products) is 72.0 / 28.0 (Fig. 2.18).

Fig. 2.18

*Rolled ferrous metals sales, 2019*

2.2.5. REAL HOME CONSUMPTION (RHC) OF STEEL PRODUCTS

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

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

Data on RHC in 2018 and 2019 is 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 sales - based on information from Bulgarian producers.

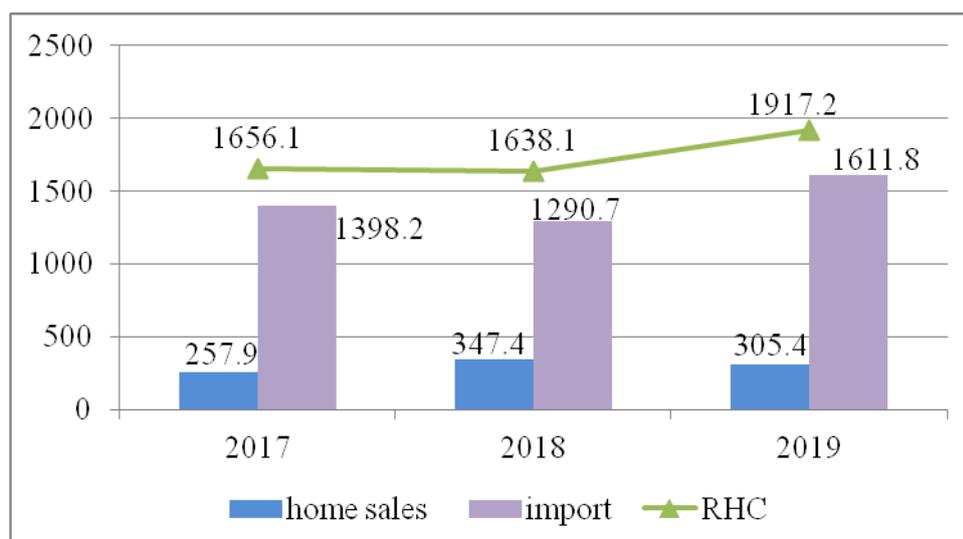
The RHC of steel products in 2019 goes up by 279.1 thousand tons compared to 2018 and reaches 1 917.2 thousand tons (17 % increase).

Table 2.8

Products	2018			2019			2019/2018	
	Domestic sales	Import	RHC	Domestic sales	Import	RHC	Difference	%
Long RFM	270.1	381.4	651.5	241.0	454.9	695.9	44.4	106.8
Flat RFM	40.6	644.3	684.9	31.8	721.4	753.2	68.3	110.0
RFM total	310.7	1 025.7	1 336.4	272.8	1 176.3	1 449.1	112.7	108.4
RFM finished products	36.7	265.0	301.7	32.6	435.5	468.1	166.4	155.2
Total	347.4	1 290.7	1 638.1	305.4	1 611.8	1 917.2	279.1	117.0

*Source: Customs statistics and NRA (import)
Company data (domestic sales)*

Fig. 2.19

*Real home consumption (RHC), 2017-2019*

The consumption of steel products is also expressed by the so-called Apparent Steel Use (ASU) calculated by the formula:

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

ASU – apparent steel use, 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)

The **apparent steel use in Bulgaria in 2019 is 1 525.6 thousand tons**. An increase is observed for the third consecutive year and compared to 2018 it is by 215.6 thousand tons.

Table 2.9

Apparent steel use, thousand tons

Year	Production	Import	Export	ASU	ASU per capita
2012	895.1	1 028.8	951.8	972.1	133.5
2013	945.1	1 125.9	923.0	1 148.0	157.6
2014	1 016.2	1 487.1	984.9	1 518.4	210.8
2015	953.5	1 338.6	923.1	1 369.0	191.4
2016	1 023.2	1 473.3	1 039.3	1 457.2	205.2
2017	946.6	1 398.2	1 326.8	1 018.0	144.4
2018	1 130.9	1290.7	1 111.9	1 309.7	192.4
2019	968.3	1 611.8	1 054.8	1 525.3	219.4

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

The **apparent steel use (ASU) per capita** is another important indicator.

The **ASU per capita in Bulgaria is between 150 – 200 kg** with EU(28) average above 300 kg. In 2019 the ASU per capita in Bulgaria is 219.4 kg per capita, which is the highest for the last 8 years (Table 2.9). The ASU per capita is an economic

indicator and for the developed countries, including EU member-states, it is above 500 kg per capita.

In 2019 the countries with the highest ASU per capita in the world including EU are the following:

- South Korea – 1 1 039.0 kg per capita
- Taiwan (China) – 759.58 kg per capita
- Czech Republic – 673.6 kg per capita
- China – 632.9 kg per capita
- Japan – 498.1 kg per capita
- Austria – 444.5 kg per capita
- Italy – 420.5 kg per capita
- Germany – 417.9 kg per capita

The average ASU per capita in the EU (28) in 2019 is 309.6 kg per capita.

In 2019 the real home consumption (RHC) and the apparent steel use (ASU) in Bulgaria show different but relatively close values. The apparent consumption takes into account not only the domestic sales of the producers but also the influence of various factors - stocks, re-exports etc. Both indicators illustrate the real trend of decline or growth in the consumption over a period of time - an indicator characterizing the structure of the country's economic development.

In 2019 world steel use is 1 767.5 million tons, by 59.1 million tons more than in 2018. An increase of 3.5% is reported. The global trend is for a continuous increase in the steel products use. The largest consumer, as in 2018, remains China - with 907.5 million tons (71.4 million tons more than in 2018). In 2019 in the EU (28) use decreased by 9.3 million tons and was 158.7 million tons or a decrease of over 5%.

In 2019 the USA and Canada also reduced their steel use by 2 million tons each compared to the previous year.

2.3. PRODUCTION OF REFRACTORY MATERIALS AND ARTICLES

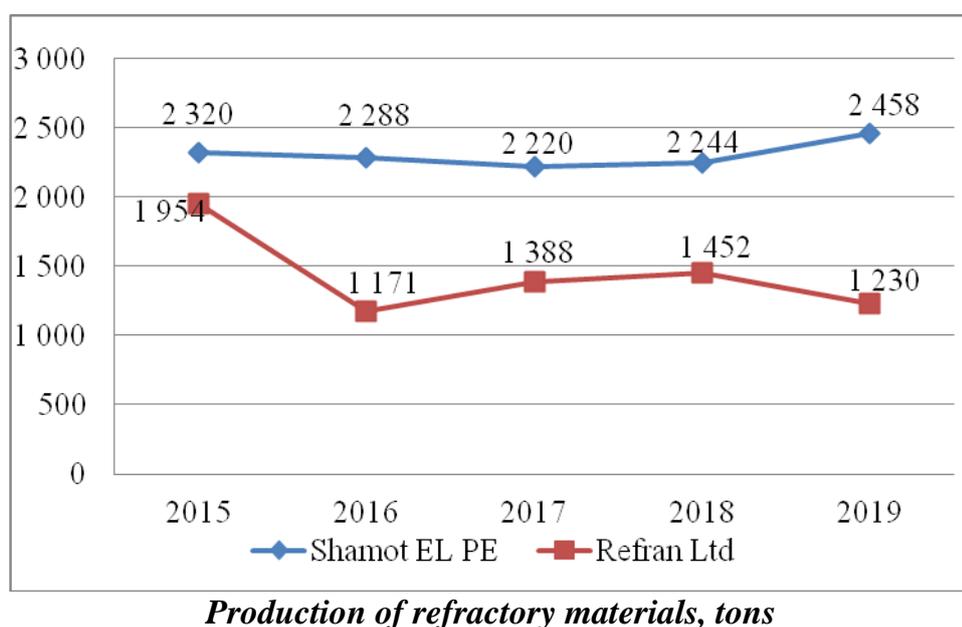
The production of refractories and refractory materials is an activity directly related to the metallurgical industry. The main suppliers of refractory materials for lagging and coating of furnaces and aggregates for casting, storing and spilling of liquid metal are the companies “Shamot EL PE 2007” Ltd and “Refran” Ltd, both are BAMI-members.

The production is intended mainly for domestic use, which depends on the performed construction and repair activities of furnace units from different industrial sectors (metallurgy and energy).

Refran Ltd specializes in the production of high added value refractory materials. It also produces small quantities of molded products. The company successfully implements projects under OP "Innovation and Competitiveness" and "Human Resources Development" during the period 2014 - 2020. New crushers for grinding have been installed, a solar park has been built for electricity production to cover the company's needs.

The company implements the circular economy concept and used refractory materials are the main raw material used. The company reduces the consumption of primary raw materials and protects the environment.

Fig. 2.20



The refractory materials produced in 2019 by the two companies - members of BAMI is 3 688 tons totally. The quantity is at the level of the previous year - barely 4 tons less.

Shamot EL PE Ltd reported an increase in production - by 214 tons (9.5%), and Refran Ltd - a decrease of 222 tons (15%).

During the year in reference there were no exports of refractory materials.

2.4. METAL CASTING

The capacities for production of castings of ferrous and non-ferrous metals and their alloys are established as independent enterprises or are part of the production chain to finished products. In these cases, the foundry activity is not reported independently, the castings are not commodity products for such enterprises. An example is **Berg Montana Fittings JSC, Montana**. Their castings are part of the technological scheme and are used for the production of fittings, which are the final products, mainly exported.

In the activity "Manufacture of basic metals" casting is under Code 24.5 and it includes the production of all types of metal castings and alloys, which are the final product. The country has foundry facilities with a capacity exceeding today's domestic needs. During the economic transition, some of these companies were liquidated and others went through bankruptcy proceedings. But even now these capacities are not enough utilized. Preserving and developing them depends on their competitiveness and finding foreign markets.

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

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

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

According to latest NSI the data for 2017-18 about activity NCEA 24.5 "Metal casting" is as follows:

Table 2.10

Indicator	2017	2018	2018/2017 (%)
Production, million leva	241	230	95.4
Value added, million leva	91	84	92.3
Total employed in NCEA 24.5 Metal casting	3 909	3 498	89.5
Average monthly wage (AMW), leva	943	1003	106.4

In 2018 the number of employees in the foundry sector decreased by 411 people, and in the average monthly wage there is a 6.4% increase compared to 10% for the entire activity.

According to Eurostat data for 2018 in the EU (27) all metallurgical activities, including the production, processing and casting of metals, report industrial production worth a total of 357 billion euros, incl. **metal casting with production**

worth 38.0 billion euros. This value corresponds to the level of production for 2017. However, the relative share decreased from 11% to **10.6% in the total volume of European metallurgical production.**

The value of foundry production in 2018 by companies in Bulgaria decreased by 11 million leva (4.6%). **The share of metal casting in the metallurgical production in the country remains very low - 2.3% (2.5% in 2017).**

SECTION THREE

NON-FERROUS METALLURGY IN BULGARIA

3.1. PRODUCTION OF NON-FERROUS METALS

Non-ferrous metallurgy in 2019 is characterized by sustainable production, but also by changing prices of non-ferrous metals and conditions on the international markets. To improve their competitiveness and position in world trade, companies continue to invest in new capacities, technology and modernization aiming at high energy, raw materials and environmental efficiency. In 2019 alone, more than 150 million leva were invested in the sector in implementation of new investment projects.

3.1.1. PRODUCTION OF COPPER (ANODIC AND ELECTROLYTIC)

In Bulgaria anodic/electrolyte copper is produced in Aurubis Bulgaria JSC. The company is part of the world leading integrated group Aurubis JSC for copper production and processing.

Aurubis Bulgaria JSC consists of four main production units: metallurgical production, cathode copper refinery, installation for production of sulfuric acid as a treatment plant and enrichment plant. The company produces anode and cathode copper, as well as by-products such as sulfuric acid, anodic sludge, fayalite.

Electrolytic copper is widely used in the production of copper products and articles, in electrical engineering and electronics, mechanical engineering, energy, chemistry, construction, automotive and household sectors.

For the period after the privatization of the company in 1997 until the end of 2019, more than 1.2 billion leva have been invested in production modernization, infrastructure and environmental protection.

In 2019 the investments made exceed 25 million euros. Projects for cooling of the slags were fulfilled which will improve cristalization and will reduce the emissions. The energy transmission and distribution system of the company was modernized, the road infrastructure and buildings were renovated and a new cell of the landfill for fayalite storage was built.

Data on the processed concentrates and scrap for the production of anodic and electrolytic copper during the period 2015 – 2019 is given on Table 3.1 and Figure 3.1.

Table 3.1

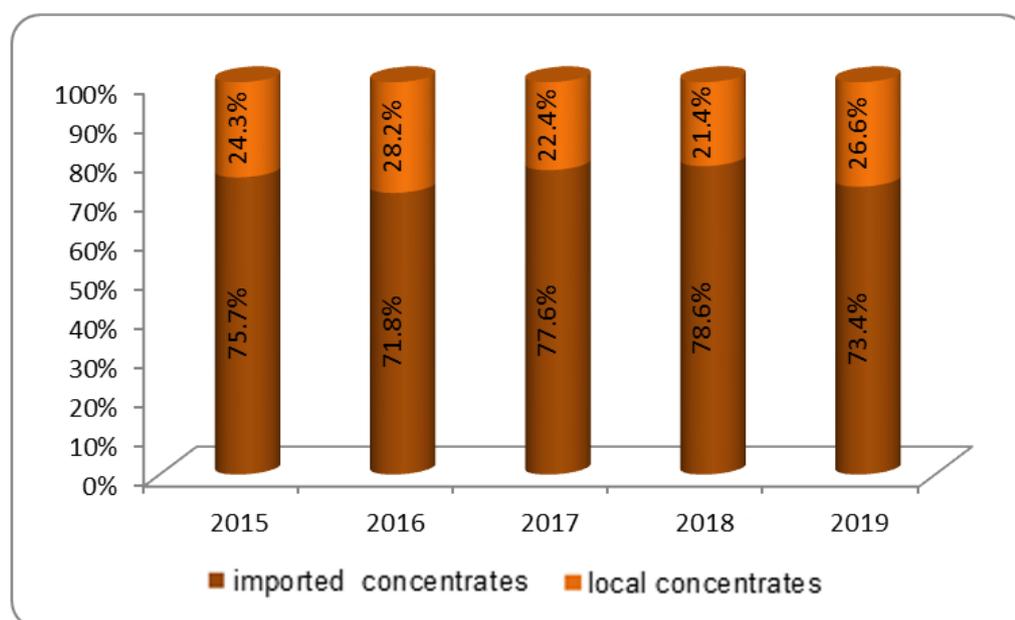
Processed raw materials for the production of anodic and electrolytic copper

Product	2015	2016	2017	2018	2019	Difference 2019/2018	
						+/-	%
Concentrates, tons	1 203 248	1 055 636	1 357 144	1 364 490	1 160 132	-204 358	85.0
- copper contents,%	24.57	23.69	24.00	23.94	22.95	-0.99	
- metal contents, tons	295 690	250 080	325 754	326 661	266 250	-60 411	81.5
Incl. in imported	223 942	179 507	252 751	256 820	195 323	-61 497	76.0
in local	71 748	70 573	73 003	69 841	70 927	1 086	101.6
Scrap (purchased), tons	56 168	51 768	52 507	41 844	39 814	-2 030	95.15

Source: Company data

1 160 132 tons of imported and local copper concentrates with a copper content of 266,250 tons were processed in 2019. The concentrates are 204 358 tons less than in 2018 and this is due to reduced imports. The ratio of the metal contained in the imported and domestic primary raw materials is presented on Fig. 3.1. The share of imported concentrates decreased by 5%, the share of domestic production increased. The quantities of Bulgarian concentrates remain at approximately the same level - with a copper content of about 70 thousand tons / year.

Fig. 3.1

*Concentrates processed, tons metal*

For second year in a row, the processed copper waste decreases. In 2019 it is 4.9% less than the previous year.

The production of anodic and electrolytic copper for the period 2015 - 2019 is presented on Table 3.2 and in Fig. 3.2.

Table 3.2

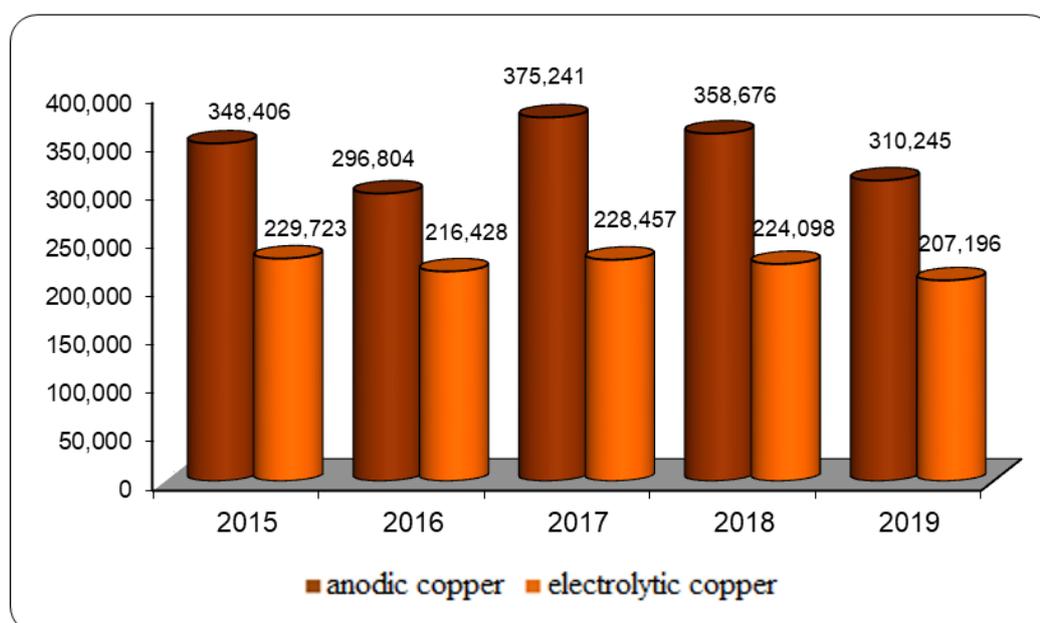
Production of anodic and electrolytic copper, tons

Product	2015	2016	2017	2018	2019	Difference 2019/2018	
						+/-	%
Anodic copper	348 406	296 804	375 241	358 676	310 245	-48 431	86.5
Electrolytic copper	229 723	216 428	228 457	224 098	207 196	-16 902	92.6

Source: Company data

In 2019 the production of anodic and cathode copper decreased by 13.5% and 7.4%, respectively due to scheduled and unscheduled repairs. The reduced quantities of processed concentrates also lead to a reduction in the quantities of sulfur contained for the production of sulfuric acid. 1 160 120 tons were produced, which is about 150 thousand tons less, a decrease of 11.4% compared to 2018.

Fig. 3.2

*Production of anodic and electrolytic copper in 2019, tons*

In 2019 world production of refined copper is 23.9 million tons, minimal decreasing of 0.7%. The quantities of produced electrolytic copper in the world for the last three years are presented in Table 3.3 and Fig.3.3.

By regions, the largest drop is reported by the United States and South America /Chile and Peru/, followed by Africa /Zambia/ and Europe / EU member-states/. About 50% of the reduced quantities in the European Union are a result of the decline in production in Aurubis Bulgaria.

Table 3.3

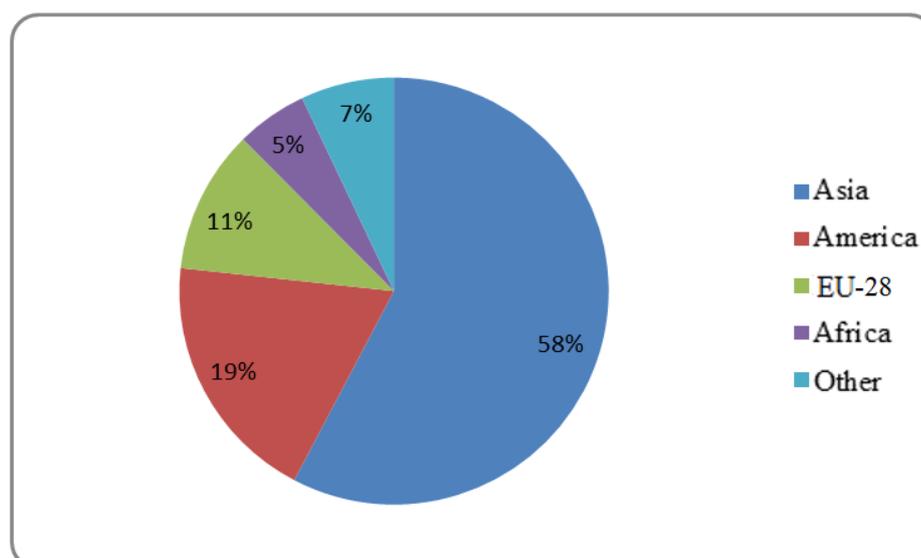
World production of electrolytic copper, thousand tons

Region	2017	2018	2019	Difference 2019/2018	
				+/-	%
Asia	13 190	13 510	13 802	292	102.2
America	4 783	4 791	4 553	-238	95.0
Europe	3 885	3 954	3 860	-94	97.6
incl. EU-28	2 728	2 699	2 601	-98	96.4
Africa	1 290	1 436	1 284	-152	89.4
Others	376	407	425	18	104.4
Total	23 524	24 098	23 925	-173	99.3

Source: ICSG

Asia ranks first in the production of electrolytic copper with a share of 57.7% and it is the only region with a growth of 2.2%. China is the major contributor to this growth. It is followed by America with a share of 19% and a decrease in refined production by 5%. Europe ranks third with a share of 16.1% and a decrease of 2.4%. The share of the EU (28) in European production is 67%, and in that of the world - 10.9%.

Fig. 3.3



World production of electrolytic copper (by regions), 2019, %

Electrolytic copper produced in Bulgaria in 2019 is 0.87% of world production and 7.97% of that in the EU (28), respectively 0.94% and 8.49% in 2018. Anodic copper has a 1.55%-share of world production and 14.1% of production in the EU.

3.1.2. LEAD PRODUCTION

KCM JSC is the only company in the country and a leading company in Southeast Europe and the Black Sea region specializing in the production of lead, zinc and related metals and products, mainly from primary raw materials. The company is part of KCM 2000 JSC, one of the largest industrial groups in Bulgaria. It has production activities in the field of ore mining, production of concentrates, extraction of non-ferrous and precious metals and their alloys, chemical products, technological engineering, industrial services.

A large-scale project "Technological renewal and expansion of production /TORP/" was implemented by KCM JSC and a technological scheme for integrated lead and zinc production was introduced on the basis of state-of-the-art technological renewal, resource efficiency was increased and the raw materials mix was expanded.

Preparations for the implementation of an investment project "Technological Integration of KCM" worth 130 million euros began in 2019. It will build on the achievements of TORP and apply best practices for the production of lead and zinc, combined with the highest degree of recycling of waste that contain metals from their production list.

The new investments in 2019 are worth 23.9 million leva. The main aspects of the investment activities are: Optimization of the treatment and recycling equipment and of process gases from combustion furnaces. Welz burner №4 has been gasified and the filter capacities in cadmium production have been replaced. The investments optimize the operation of the technological facilities, improve energy efficiency and environmental parameters.

Data on the processed primary (concentrates) and secondary raw materials in the production of lead are shown on Table 3.4. and in Fig. 3.4.

Table 3.4

Main raw materials in the production of lead, tons

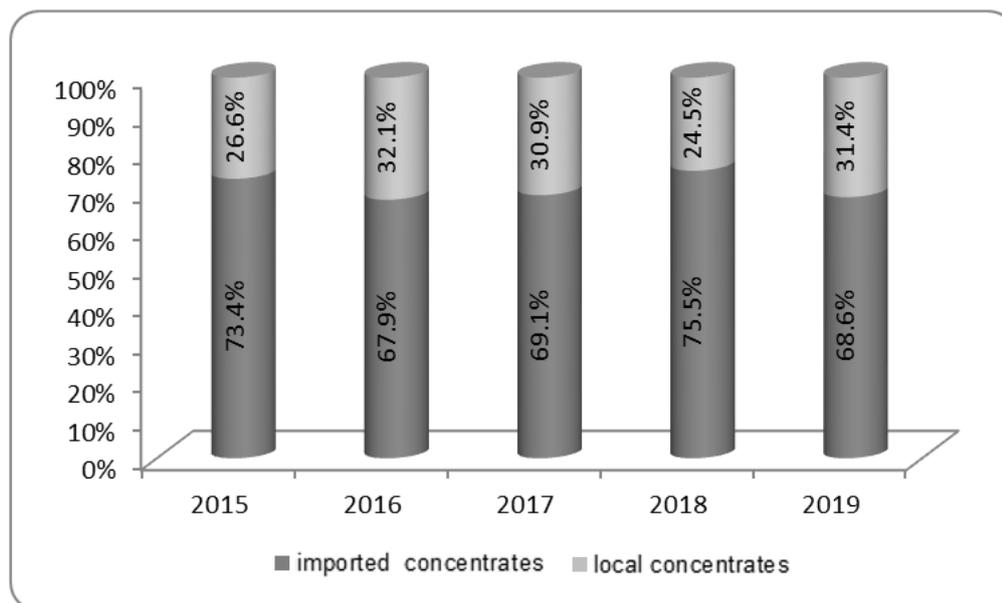
Product	2015	2016	2017	2018	2019	Difference 2019/2018	
						+/-	%
Metal in concentrates	61 908	61 358	52 149	60 192	54 468	-5 724	90.5
incl.: in imported	45 452	41 670	36 050	45 469	37 371	-8 098	82.2
in local	16 456	19 688	16 099	14 723	17 097	2 374	116.1
Processed waste (imported)	20 604	11 235	15 849	11 809	18 356	6 547	155.4

Source: Company data.

The processed concentrates in 2019 contain 54 468 tons of lead, by 5 724 tons less metal than the previous year. The decrease is entirely due to imported raw materials. They are compensated both by the increased amounts of metal from local concentrates and by the processing of waste lead-containing products. The input of local (own) concentrates increased by 16.1% and their share represents 31.4% of the total amount of lead contained in the concentrates compared to 23% in the previous year (Fig. 3.4).

The reduced lead in concentrates is compensated by the increased amounts of lead waste and intermediates. The new lead installation makes it possible to increase the processing of non-standard lead raw materials, semi-finished products and waste. In 2019 they are 6 547 tons more than the in the previous year (growth of 55.4%). Their relative share /as metal content/ in the raw materials increase from 16.4% in 2018 to 25.2% in 2019.

Fig. 3.4



Processed concentrates, tons metal

Secondary lead raw materials, including battery waste, account for a significant share of the raw material balance in the production of lead and lead alloys. More than 50 000 tons are recycled in the country.

Apart from KCM JSC, modern facilities for processing of lead accumulators waste and unusable lead batteries have been built in Monbat Recycling JSC and EL BAT JSC.

Monbat Recycling EAD is a large processor of lead waste and a producer of lead alloys in the country. The company is part of the economic group Monbat Group and the products are used in the production of lead-acid batteries. In 2019, BGN 3 million were invested in the company for new facilities.

Monbat Recycling JSC is a large processing company of lead waste and a producer of lead alloys in the country. The company is part of the economic group Monbat Group and the products are used in the production of lead-acid batteries. In 2019 3 million leva were invested in new facilities by the company.

EL BAT JSC also recycles lead waste, including unusable lead-acid batteries using modern technological schemes. After modernization and capacity increase today the company produces 15 000 tons of secondary lead.

Data on the total lead production, including battery alloys from 2015 to 2019 is presented on Table 3.5 and Fig. 3.5.

Table 3.5

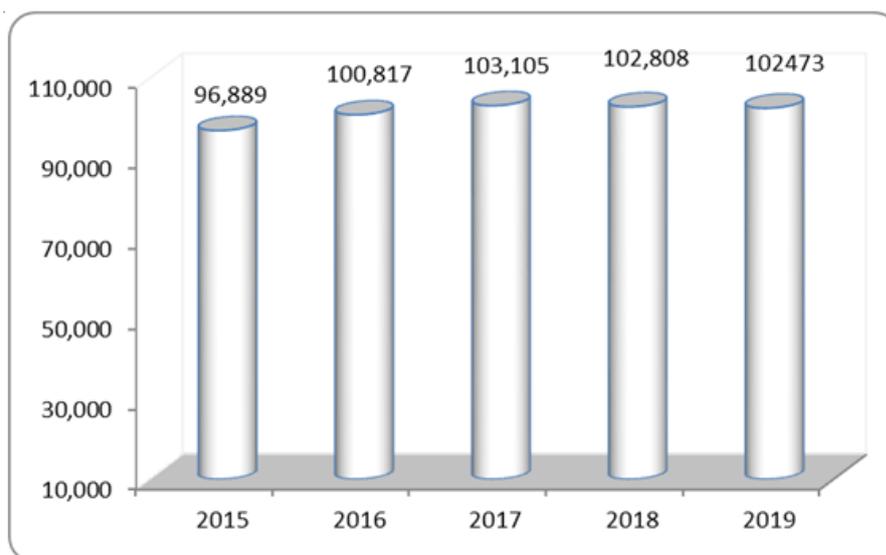
Lead production, tons

Product	2015	2016	2017	2018	2019	Difference 2019/2018	
						+/-	%
Lead - primary	70 252	69 256	71 653	71 697	71 595	-102	99.9
“KCM”JSC	70 252	69 256	71 653	71 697	71 595	-102	99.9
Lead - secondary	26 637	31 561	31 452	31 111	30 878	-233	99.3
“Monbat Recycling” PJSC	16 231	16 581	16 502	16 211	15 878	-333	97.9
“El Bat” JSC	10 406	14 980	14 950	14 900	15 000	100	100.7
Lead - total	96 889	100 817	103 105	102 808	102 473	-335	99.7

Source: Company data

The total quantity of lead produced in 2019 is 102 473 tons, with a minimum decrease of 0.3%. The primary lead ingots from concentrates, intermediates and secondary raw materials is at the level of the previous year (99.9%), and the secondary lead from the processing of lead-acid bateries waste has a slight decrease of 2.3%.

Fig. 3.5

*Lead production - total, tons*

World lead production by regions and countries, largest producers in the last three years are presented on Table. 3.6, and in Fig. 3.6 - the relative share by regions in 2019.

Table 3.6

World lead production, in thousand tons

Country/Region	2017	2018	2019	Difference 2019/2018	
				+/-	%
Asia	7 211	7 357	7 507	150	102.0
- incl. China	4 870	4943	5 100	157	103.2
- incl. Republic of Korea	800	801	800	-1	99.9
- incl. India	570	623	640	17	102.7
America	2 092	2 179	2 207	28	101.3
- incl. USA	1 121	1 157	1 170	13	101.1
EU(28)	1 784	1 734	1 715	-19	98.9
-incl. Germany	354	315	326	11	103.5
-incl. Great Britain	323	303	298	5	98.3
Others	479	559	490	-69	87.7
Total	11 566	11 829	11 919	90	100.8

Source: ILZSG

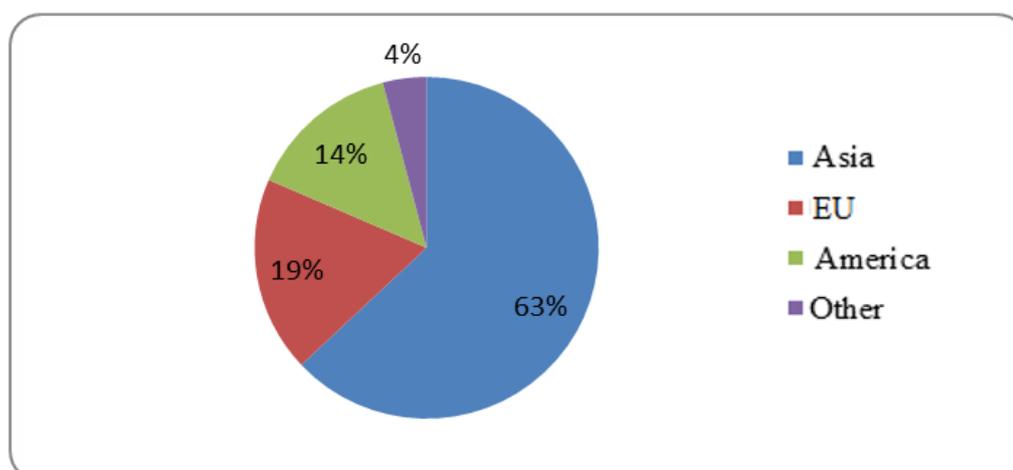
Asia has the largest relative share in world production (63%) and growth of 2%, again there is increased production in China - by 3.2% and in India - by 2.7%. **In America production grew by 1.3% with insignificant growth** in the United States, Mexico and Canada, with the region's relative share being 18.5% of world lead production.

The EU (28) ranks third with a share of 14.4% (15% in 2018) and a decrease in production by 1.1% (in Italy - by 5.3%, in Poland - by 4.4%, Spain - 2.9%).

Germany has the largest relative share in the EU (19%) and growth of 3.5%. Great Britain and Spain occupy the second and third positions with shares of 17.4% and 9.9%, respectively.

Germany has the largest relative share in the EU (19%) and growth of 3.5%. Great Britain and Spain take second and third place with shares of 17.4% and 9.9% respectively.

Fig 3.6



World lead production (by regions), 2019, in %

In 2019 the total amount of lead produced in Bulgaria is 0.88% of the world and 5.98% of that of the EU (28) compared to 0.87% and 5.93% in 2018.

In terms of volume of lead produced from primary and secondary raw materials, Bulgaria remains at its seventh place among the countries in the EU.

3.1.3. ZINC PRODUCTION

In KCM JSC integrated production zinc concentrates, zinc-containing intermediates and secondary raw materials are also processed to zinc ingots and zinc alloys.

A number of other rare and precious metals and chemical products (sulfuric acid, cadmium, tellurium, gold, silver) are produced as by-products from lead and zinc raw materials.

Data on processed metal contained in local and imported concentrates and the input of secondary raw materials / scrap in the production of zinc is shown in Table 3.7.

Data on processed metal contained in local and imported concentrates and the input of secondary raw materials/scrap in the production of zinc is shown in Table 3.7.

Table 3.7

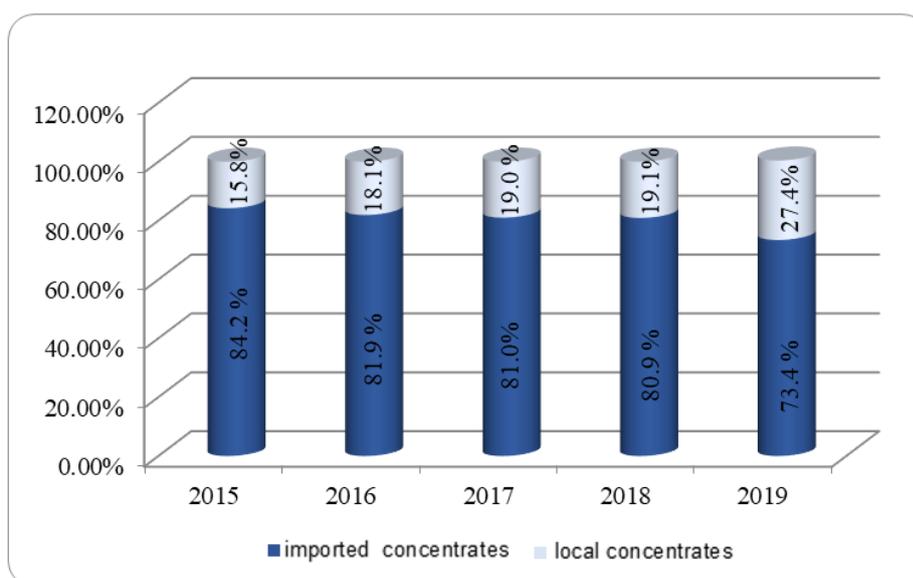
Processed raw materials for the production of zinc, tons

Product	2015	2016	2017	2018	2019	Difference 2019/2018	
						+/-	%
Metal in concentrates, incl.:	68 043	63 011	57 307	59 646	54 688	-4 958	91.7
- import	57 260	51 596	46 421	48 279	40 118	-8 161	83.1
- local	10 783	11 415	10 886	11 367	14 570	3 203	128.2
Processed imported scrap	11 983	16 802	16 226	18 191	19 231	1 040	105.7

Source: Company data

In 2019 the processed concentrates contained 5 688 tons of zinc - 8.3% less than the previous year. The difference is entirely due to the reduced imports of primary raw materials. By expanding the raw materials mix, the input of secondary raw materials increased by 1040 tons and their share in the total raw material balance reached 26% (23.4% in 2018). Zinc in local concentrates now represents 26.6% of the total amount of metal in concentrates used (19.1 % in 2018). In recent years there is a trend for this share to increase as a result of new investments in mining activities.

Fig. 3.7

*Processed concentrates, tons of metal*

Data on zinc produced in the last five years is given on Table 3.8.

Table 3.8

Zinc production, tons

Product	2015	2016	2017	2018	2019	Difference 2019/2018	
						+/-	%
Zinc - total	75 095	75 811	73 715	75 150	73 512	-1 638	97.8

Source: Copmany data

73 512 tons of zinc were produced in 2019, which is by 1 638 tons (2.2%) less than the previous year.

Table 3.9 and Figure 3.8 show the world zinc production by regions, largest producers, relative share and increase/decrease compared to the previous year.

Table 3.9

World zinc production, thousand tons

Country/Region	2017	2018	2019	Difference 2019/2018	
				+/-	%
Asia	8 906	8 310	8 828	518	106.2
- incl. China	6 144	5 607	6 160	553	109.9
- incl. India	818	746	708	-38	94.9
Europa	2 422	2 506	2 412	-94	96.2
- incl. EU 28	1 993	2 060	2 012	-48	97.7
America	1 613	1 729	1 749	20	101.2
- Incl. Canada	598	696	655	-41	94.1
Others	545	557	510	-47	91.6
Total	13 486	13 102	13 499	397	103.0

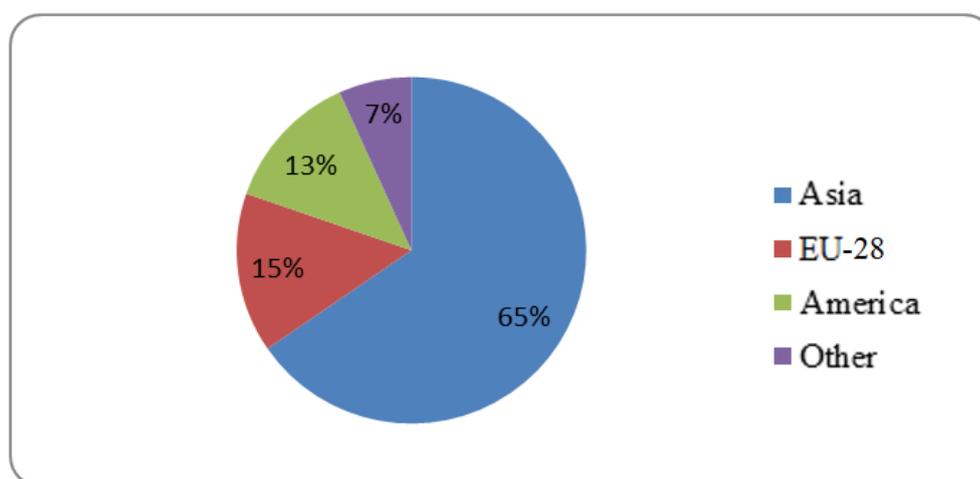
Source: ILZSG

World production in 2019 goes up by 3 %. **Asia has the largest share in world production - 65%**. The increased production in China - 9.9% up, is the reason for the reported growth in the region by 6.2%.

The EU (28) maintained its second place as a producer with a relative share of 15%, but decreased year-to-year by 2.3%, mainly due to the reduced production in the Netherlands - by 10.4%, and France - by 8.4%. Spain is the largest producer in the EU with a share of 24.8%, followed by Finland - with 14.4% and Belgium with 13.4%.

America ranks third with a 13%-share and growth of 1.2%. It is due to increased production in Mexico and Peru by 11.3% and 10.3%, respectively.

Fig. 3.8



World zinc production (by regions) in 2019, %

Bulgarian zinc production represents 0.54% of world production (0.56% in 2018) and 3.65% of total EU (28) production (3.57% in 2018).

Data on the production of non-ferrous metals in the world, which are also produced in Bulgaria, lead to the conclusion that lead and zinc production is going down only in the EU. China and America are increasing the production of these metals.

Regarding copper, decrease is reported not only in the EU, but in the the US as well. **At the same time, production in Asia is increasing for all metals and already accounts for around and above 60%. This creates real risks of developed countries becoming dependent on raw material producers in China and the Asian region.**

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

The extraction of precious, accompanying metals and chemical products is carried out in built capacities accompanying main production and their volume depends on their content in the processed primary raw materials (concentrates).

An important part of the technological processes in the production of basic non-ferrous metals (copper, zinc and lead) is the utilization of other metallic and non-metallic components, which are released into process gases, wastewater or solid by-products. Their processing produces accompanying metals and commodity chemical products, which increase the efficiency of production and lead to environmental protection.

Data on the production of precious, byproduct metals, alloys and chemical products is given on Table 3.10.

Table 3.10

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

Product:	2015	2016	2017	2018	2019	Difference 2019/2018	
						+/-	%
Cadmium ingots, t	344	362	333	313	315	2	100.6
Silver, kg	37 955	52 526	53 053	41 315	35 145	-6170	85.1
Silver products, kg	2 785	2 445	2 764	2 620	2 396	-224	91.5
Gold, kg	211	212	249	296	295	-1	99.7
Gold products, kg	41	82	54	44	17	-27	38.6
Tellurium, kg	4 046	4 479	5 095	3 931	2 944	-987	74.9
Sodium sulfate, t	1 372	342	1 747	785	1 260	475	160.5
Sulfuric acid, t	1340843	1209594	1532099	1449 979	1295322	-154657	89.3

Source: Company data

The precious and by-product metals are produced in KCM JSC during the processing the lead-zinc raw materials. Precious and rare metals from copper raw materials are concentrated in sludge, which is processed abroad. In 2019 the produced quantities of precious metals /gold and silver/ and tellurium decrease and cadmium remains at the 2018.

The non-ferrous metallurgical plants are the only producers of sulfuric acid, which is obtained as a by-product in the process of purification of gases in the processing of copper, lead and zinc primary raw materials. 154.7 thousand tons less sulfuric acid was produced in 2019 due to the reduced volume of processed sulfide concentrates from non-ferrous metals.

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

The metal processing industry in Bulgaria is well developed, with modern production facilities. Various metal products (sheets, strips, foil, pipes, profiles, etc.) with higher added value are produced based on the production of copper, zinc, lead, aluminum and their alloys.

Data on production in the period 2015 - 2019 is presented on Table 3.11.

In 2019 the total amount of rolled non-ferrous metal products decreased slightly - by 1.4%.

In contrast to the very successful two previous years, in the production of copper and copper alloy products there was a slight decrease of 1.1%, and in rolled aluminum it was 1.7%.

HNFM production represents 46.2% of the total quantity, and that of aluminum and aluminum alloys is 53.8%.

Table 3.11

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

Product	2015	2016	2017	2018	2019		Difference 2019/2018	
					тона	%	+/-	%
R/P NFM and alloys	57 353	57 700	71 853	80 539	79 678	46.2	-862	98.9
incl copper	41 329	46 649	57 244	64 197	62 531	36.2	-1666	97.4
brass	8 437	11 051	14 609	16 342	17 147	10.0	805	104.9
zinc	7 587	-	-	-	-	-	-	-
R/P aluminium - Total	83 184	87 976	91 126	94 424	92 862	53.8	-1 562	98.3
incl: Alkomet JSC	64 894	65 646	67 096	68 334	68 484	39.7	150	100.2
- ETEM Gestamp Extrusions JSC	17 300	21 122	22 820	24 885	22 994	13.3	-1 891	92.4
-PIH Industry	990	1 208	1 210	1 205	1 384	0.8	179	114.9
Total:	140 537	145 676	162 979	174 963	172 540	100.0	-2 423	98.6

Source: Copmany data

Sofia Med JSC is the largest company in the country for the production of finished products from copper and copper alloys.

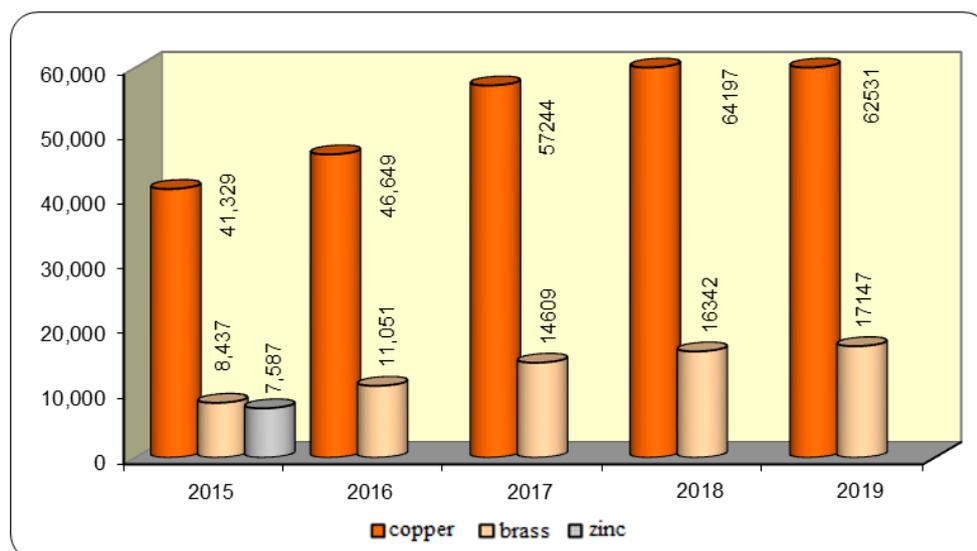
Sofia Med JSC produces a wide range of rolled and pressed products (sheets, strips, circles, discs, rails, rods and profiles), which are used in construction, mechanical engineering, electrical engineering, automotive and other sectors of the processing industry.

Fig. 3.9 presents the quantities of copper and copper alloys produced, by type, in the period 2015-2019.

In 2019, the production of copper R/P products decreased by a total of 2.6%. Rolled products by 4.1% respectively, and pressed by 0.3%.

Brass products are only rolled. For the period 2015 - 2019 the production more than doubled and last year reached 17 147 tons, with an increase of 4.9%.

Fig. 3.9



Production of R/P HNFMs, tons

The ratio of the produced copper and brass products in the total quantity is 78.5% to 21.5% (for 2018 it is 79.7% to 20.3%).

Rolled products are 68.2% of the total production volume.

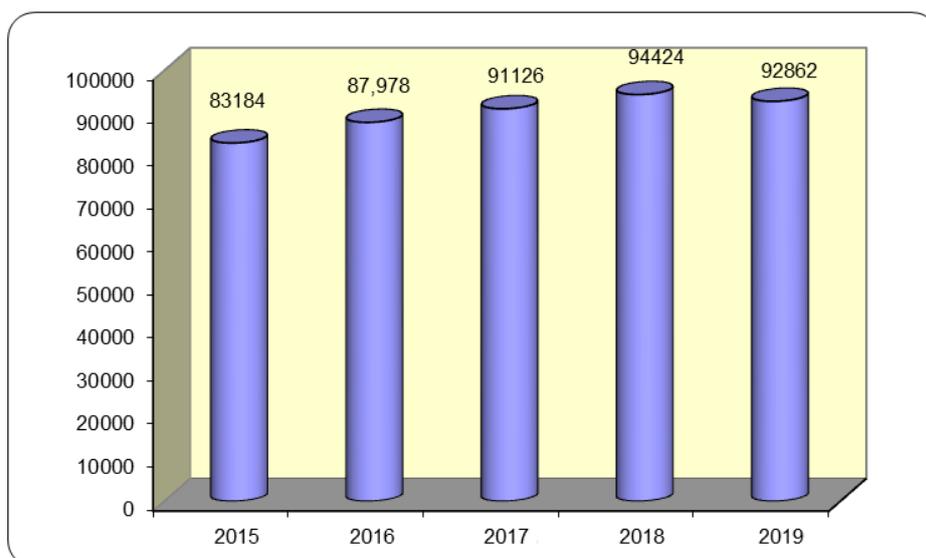
Sofia Med JSC processed 25 563 tons of external scrap - by 15.2%. more than 2018. The larger amount of used secondary raw materials leads to a reduction in the volume of processed primary metals and has a positive impact on the economic performance of the company.

"Sofia Med" JSC investments in 2019 are worth 21 million leva. A new line for cold rolling with a capacity of 70 thousand tons/year is being launched, which increases the production capacity and 98% of the production will be exported to foreign markets.

The largest producers of rolled and pressed aluminum in the country and members of BAMI are Alcomet JSC, Shumen and Etem Gestamp Extrusions (ETEM Bulgaria JSC), Sofia. Aluminum welded pipes are produced in EMC Distribution JSC, Ruse.

Data on the production of R/P aluminum by company is given on Table 3.11, and Figure 3.10 shows the total production quantity.

Fig. 3.10



Production of R/P aluminum, tons

"Alcomet" JSC is the largest Bulgarian company specialized in the production of pressed and rolled aluminum - strips, sheet, foil, profiles, finstock. The company's product list includes automotive parts as well.

In 2019 AlcometJSC produced 68 484 tons of rolled products with a minimum growth of 0.2% compared to 2018. Alcomet's products represent **73.8% of the total amount of R/P aluminum** in the country.

The ratio between rolled and pressed products is the same as in 2018 - 66.3 / 33.7.

In 2019 "Alcomet" JSC made investments worth 31.5 million leva. The investment program (for a total of 69 million leva) which started in 2016 is about to be finalized. The targets of the project are capacity increase up to 100 thousand tons/year and to expanding the product range, with priority for automotive products. Last year the new high-tech 2500-ton press for production of special aluminum profiles, as well as a line for continuous casting of rolls started operating at full capacity. The finishing works for the commissioning of new generation col-rolling mill for strips and the relative equipment are being carried out. Next year the implementation of a new investment program is planned to start – it is related to the establishment of a workshop for mechanical processing of aluminum profiles and the introduction of new technological equipment to expand the product capabilities of press production.

The company has processed 5 746 tons of aluminum waste (by 24.2% less than in 2018).

"Etem Bulgaria" JSC produces different types of aluminum profiles and architectural constructions, mainly door and window frames and facade elements for buildings. For several years the company has been a certified producer of automotive products for the world biggest automotive companies.

As a result of the investment agreement between Etem Bulgaria JSC and Gestamp Group signed at the end of April 2019, two joint companies were established. One of them - "Etem Gestamp Aluminum Extrusion" is engaged in the production of automotive components, and the other - "Gestam Etem Automotive Bulgaria" is for additional processing of profiles. The planned investment in the new plants is 30 million euros for a period of three years, which includes the purchase of a new extrusion line.

The relative share of Etem Gestamp Aluminum Extrusions JSC in the total production of R/P aluminum is 24.8% (26.4% in 2018). Compared to the previous year, the volume of production decreased by 7.6%.

In the past 2019 the funds invested in the acquisition of fixed assets amounted to 17.5 million leva. The investments are mainly related to the construction of a new production hall and equipment in which the new extrusion press will be installed. This is part of the overall investment program, which aims to increase production capacity due to increased demand for aluminum products.

"EMC Distribution" JSC produced 1384 tons of welded aluminum pipes, by 179 more than in 2018. The relative share of production in the total amount of R/P aluminum is 1.5%

3.1.6. UTILIZATION OF NON-FERROUS METAL WASTE

Non-ferrous metals waste is an important element of the raw material mix in metallurgical production. Their utilization leads to improvement of the economic and ecological indicators of the enterprises and high energy efficiency.

Data on the total amount of processed non-ferrous metals waste (in metal content) for the period 2015 - 2019 by the companies – members of BAMI are presented on Table 3.12.

The table shows that the total amount of processed waste in 2019 increased by 6 476 tons or 4.5%.

Table 3.12

Processed non-ferrous metals waste, tons

Waste	Total					Difference 2019/2018	
	2015	2016	2017	2018	2019	+/-	%
	Copper	75 903	62 942	68 066	64 030	65 377	1347
Lead	46 754	44 230	48 745	40 718	51 178	10 460	125.7
Zinc	11 983	16 802	16 226	18 191	19 231	1 040	105.7
Aluminum	18 277	14 615	11 793	20 581	14 210	-6 371	69.0
Total	152 917	138 589	144 830	143 520	149 996	6 476	104.5

Source: Company data

Copper, lead and zinc waste increase and aluminum secondary raw materials go down. The waste input in the production of refined copper is down by more than 2 thousand tons. At the same time, the processed waste in the production of R/P copper and brass products increased by about 3 400 tons. The input zinc waste increased by 5.7% as a result of projects in zinc production aiming to increase the recovery of zinc-containing waste in the technological scheme. The largest increase is reported in waste processed during the production of lead and lead alloys. It goes up by 10 460 tons, mainly from waste batteries.

Aluminum waste is used in the production of rolled and pressed products in Alcomet JSC and for secondary aluminum and block alloys (**Stam Trading JSC, Ges Trading LTD**).

In 2019, the processed aluminum waste decreases by more than 6 thousand tons. At the same time, the amount of exported scrap increases every year.

3.2. TRADE EXCHANGE AND CONSUMPTION OF NON-FERROUS METALS

Non-ferrous metals and products of them are subject of the stock exchange and are traded at prices set on the international markets.

The figures below show the prices dynamics of basic metal ingots, which Bulgaria produced in the period January 2019 - December 2019, taken from the official publications of the LME.

Fig 3.11
Prices of electrolytic copper (USD/ton)

The average annual price of copper on LME in 2019 compared to the levels in 2018 decreases by about 8%. In the first half of the year the prices were in the range of 5 750 – 6 500 dollars/ton, but then they started to decrease and stabilize at levels of 5800 - 6000 dollars / ton. The difference between the maximum and minimum price for the one-year period is about 1050 USD/t, a change of 16%.

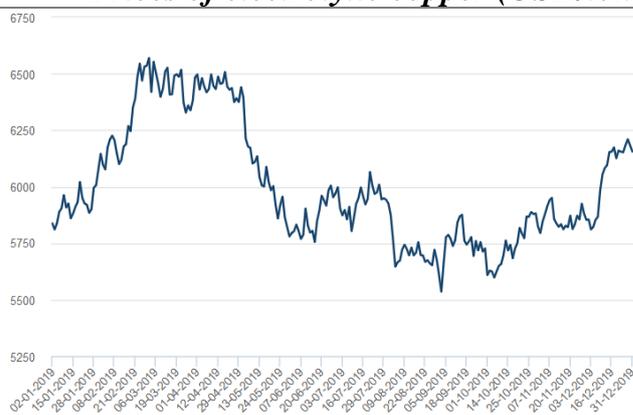


Fig. 3.12
Prices of lead (USD/ton)

In 2019 compared to 2018 the average annual LME price of lead decreased by 10.9%. Throughout the year there are significant fluctuations as the difference between the maximum and minimum price for the one-year period is about 370 USD/t, a change of 17%. In the first quarter the price increases and ranges from 2000 to 2100 USD/ton, but during the second quarter decreases to about 1800 USD/t. After this period, the trend again goes up to 2250 USD/ton. At the end of the year, however, prices decreased and remained at levels around 1900 USD/t.

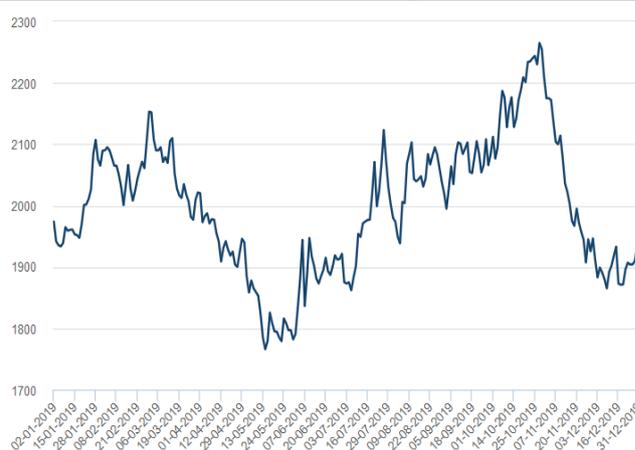


Fig 3.13
Prices of zinc (USD/ton)

The average annual LME price of refined zinc in 2019 decreased by 12.9%. As with lead, from the beginning of the year to the end of the first quarter, the prices increase from 2500 to 3000 USD/t. After this period, a decline begins and by the end of the year they are in the range of 2600 - 2300 USD/ton. The difference between the maximum and minimum average monthly price for the one-year period is about 664 USD/t, or more than 22%.



The above data shows that in 2019 the fluctuations in the prices of basic non-ferrous metals on the LME are significant. The 2018 trend for keeping prices at lower levels for a large period of the year remains in 2019 as well.

What is typical for the period is that the year begins with growth and at the end of the first quarter for all three major metals there is a decline, the greatest drop being in lead prices. At the end of the year the prices are close to those at the beginning of the period.

3.2.1. IMPORT OF NON-FERROUS METALS AND FINISHED PRODUCTS

Data on non-ferrous metals imported in Bulgaria, finished products and metal waste (scrap) for the period 2015 - 2019 is presented on Table 3.13.

The total volume of imports in 2019 is 304 968 tons with a total value of 1 765.5 million leva. Compared to the previous year 2018, it decreased by 15 688 tons in quantity (4.9 % down) and in value by 131 million leva.

Table 3.13

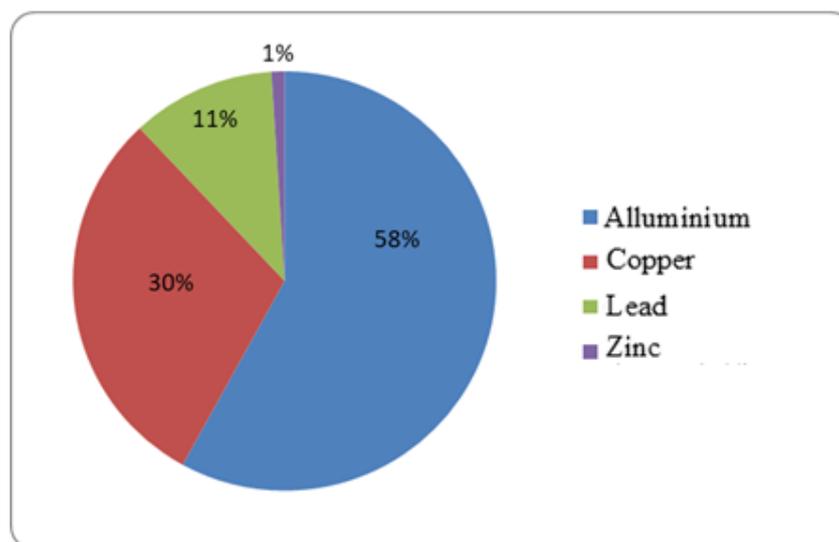
Import of basic non-ferrous metals and finished products, tons

Items	2015	2016	2017	2018	2019	Difference 2019/2018	
						+/-	%
Copper, total, incl.	85 908	93 052	108 990	104 995	90 709	-14 286	86.4
Anodes	211	127	1	6	1	-5	0.2
Cathodes, alloys, blanks	12 211	20 498	38 994	36 010	24 859	-11 151	69.0
Scrap	59 728	49 543	55 299	53 031	48 099	-4 932	90.7
Bars and profiles	5 411	5 632	5 682	6 116	5 471	-645	89.4
Wire	4 783	13 613	5 332	6 156	8 124	1 968	132.0
Sheet and foil	1 594	1 292	1 334	1 507	1 818	311	120.6
Pipes	1 970	2 347	2 348	2 169	2 337	168	107.7
Lead, total, incl.	25 181	35 463	31 059	32 443	34 196	1 753	105.4
Ingot and alloys	8 394	16 482	16 203	14 584	16 532	1 948	117.7
Scrap (pure)	16 484	17 827	14 461	16 050	15 656	-394	97.6
R/P metal	303	1 154	395	1 809	2 008	199	111.0
Zinc, total, incl.	6 491	3 896	1 398	4 736	3 709	-1 027	78.3
Ingot and alloys	5 322	3 243	656	4 528	3 487	-1 041	77.0
Scrap	610	148	50	4	9	5	225.0
R/P metal	559	505	692	204	213	9	104.4
Aluminum, total, incl.	150 548	158 162	171 041	178 482	176 354	-2 128	98.8
Ingot and alloys	108 968	116 066	123 757	133 286	137 776	4 490	103.4
Scrap	2 917	1 533	2 261	1 622	1 711	89	105.5
Bars and profiles	17 648	19 458	22 022	18 820	17 014	-1 806	90.4
Wire	3 562	4 309	4 235	4 127	3 640	-487	88.2
Sheets and strips	10 696	9 837	10 821	13 674	10 500	-3 174	78.8
Foil	5 040	4 863	5 586	5 127	4 215	-912	82.2
Pipes	1 717	2 096	2 359	1 826	1 498	-328	82.0
Total, tons	268 128	290 573	312 488	320 656	304 968	-15 688	95.1
Value, EUR million	792.0	739.6	1 008.2	1 033.7	902.7	-131.0	87.3
Value, BGN million	1 549.0	1 446.5	1 971.9	2 021.7	1 765.5	-256.2	87.3

Source: Customs statistics, NRA

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

Fig. 3.14



Structure of import of NF metals and their products (total ingots, R/P metal and scrap) in 2019

The figure shows that the commodity group aluminum and aluminum products takes up 58% of total imports (56% in 2018) of non-ferrous metals and their products. Bulgaria does not produce block aluminum and the imported metal as raw material represents 78.1% of the total commodity group (74.7% in 2018) and 45.2% of total imports. Compared to the previous year, it increased by 3.4%, as the production of rolled aluminum in the country also increased.

Deliveries of **unwrought aluminum and block alloys** are traditionally made from Russia - 47%, the EU - by 27.2%, including from Greece 14.4% and Romania 7.6%, Turkey has a 9.8%-share of the total imports.

The trend of decreasing import of **aluminum products** is positive - by 15.4%. Deliveries from the EU are 58.3%, from Turkey - 28.3%, and imports from China shrink to 7.6%.

Copper, copper products and waste are in second place in the structure of imports of non-ferrous metals and their products (30%). **Copper waste** is an efficient raw material for the production of copper and copper products, which is why it represents 53% of the commodity group and 15.8% of the total imports of non-ferrous metals in the country (16.5% in 2018). More than 62% are imported from the Balkans countries, and about 13% from Lebanon and Saudi Arabia. In 2019 the delivered quantities decreased by 9.3%.

The deliveries of refined copper and copper-based alloys are mainly from Serbia (28.8%), Russia (25.6%) and Turkey - 10%, 12.8% come from the EU member-states. In 2019 the imported quantities decreased by 31% compared to 2018. Last year the import of **copper products** increased by 11.1%, with the

largest share being held by copper wires, which are not produced in Bulgaria. More than 73% of them are imported from Turkey.

In the lead group imports are divided between **unwrought lead (ingots) and alloys** - 48% share of the total amount of lead waste and **metal lead waste** (scrap, without waste batteries) which represent 45.7%.

In 2019, there is growth in lead ingots. The quantities are imported from Serbia - 54.7%, Korea - 20.7% and the EU - 14.6%. Compared to the previous year, the import of lead scrap decreased by 2.4%.

The import of unwrought zinc in 2019 is insignificant and it went down by more than 1 041 tons (respectively 23%). Deliveries are from EU member-states. The largest importer is Spain - with 86% of the total quantity.

3.2.2. EXPORT OF NON-FERROUS METALS AND FINISHED PRODUCTS

The quantities of exported non-ferrous metals, their products and scrap metal for the last five years are shown on Table 3.14.

The total volume of exports in 2019 in quantity is 614 745 tons, worth 5 189.4 million leva. Compared to the previous year **it decreased significantly - by 78 672 tons (11.3%), and in value - by 984.8 million leva or 15.9%.**

The data show that in addition to black metals /copper, zinc and lead/, about 30% of all exports are metal products with high added value, such as sheets, strips, foil, rods, profiles and others. Due to the presence of significant processing capacities and low consumption in the country, these products are sold on foreign markets.

In 2019, the export of **electrolytic copper** decreased by 15.3%. Deliveries are mainly to China, which is the largest producer in the world and reaches 59.5% of the total volume. Turkey accounts for 23.5% and EU countries - 11.7% of the export.

Sales of **R/P copper and brass** (sheets, strips, rods, etc.) are directed mainly to EU countries (80%). In 2019 they remain at the level of the previous year.

The export of **lead ingots** increased by 0.9%., 55% of quantities are exported to Turkey, and for EU countries - 36.8%.

In 2019 the export of **zinc** (ingots) decreased by 3.4%. 47.5% of the quantities are exported to Turkey, for the EU countries - 44.9%, and for Serbia - about 7%.

Table 3.14

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

Items	2015	2016	2017	2018	2019	Difference 2019/2018	
						+/-	%
Copper, total, incl.	385 745	320 834	410 221	411 751	342670	-69081	83.2
Anodic copper	118 755	75 585	146 617	135 072	93702	-41370	69.4
Electrolytic copper	209 554	185 485	195 425	191 192	162028	-29164	84.7
Scrap	7 176	7 176	8 826	9 130	10962	1832	120.1
Bars and profiles	19 888	19 582	21 945	29 704	27811	-1893	93.6
Wire	635	6 107	324	766	1521	755	198.6
Sheet, strips and foil	28 996	26 758	36 872	45 779	46522	743	101.6
Pipes	741	141	212	108	124	16	114.8
Lead, total, incl.	81 045	77 791	81 782	79 243	78757	-486	99.4
Ingots	80 865	77 527	77 577	75 315	75996	681	100.9
R/P lead	82	85	98	110	111	1	100.9
Scrap (pure)	98	179	4 107	3 818	2650	-1168	69.4
Zinc, total, incl.	72 535	74 044	66 398	66 951	64411	-2540	96.2
Ingots	62 920	73 202	65 048	66 340	64085	-2255	96.6
R/P metal	8 267	176	687	109	3	-106	x2.75
Scrap	1 348	666	663	502	323	-179	64.3
Aluminum, total, incl.	111 496	114 091	123 883	135 472	128907	-6565	95.2
Ingots	7 073	4 422	5 840	11 620	7694	-3926	66.2
Scrap	22 351	24 153	27 638	30 837	32540	1703	105.5
Bars and profiles	30 358	31 686	34 901	38 580	38421	-159	99.6
Wire	258	154	108	270	571	301	211.5
Strips and sheets	14 785	13 737	16 060	13 659	13827	168	101.2
Foil	26 512	29 765	29 238	30 830	26913	-3917	87.3
Pipes	10 159	10 174	10 098	9 676	8941	-735	92.4
Total	650 821	586 760	682 284	693 417	614745	-78672	88.7
Value, EUR million	2 628.9	2 050.3	3 087.7	3 156.8	2653.3	-503.5	84.1
Value, BGN million	5141.7	4 010.1	6 039.1	6 174.2	5189.4	-984.8	84.1

Source: Customs statistical, NRA

R/P aluminum represents 68.7% of the export in the aluminum commodity group. Waste also has a high share of 22.8% and it is increasing, while the exported secondary block of their processing decreases by 33.4%. In 2019 the export of R/P aluminum decreased by 4.7% due to the increased sales on the domestic market and a drop in production. The quantities of aluminum foil sold are down by 12.7% and the aluminum pipes - by 7.6%. Traditionally, over 92% of sales are for EU countries.

Exported waste from copper, lead, zinc and aluminum represents 6.7% of the total export of non-ferrous metals and their products, despite the fact that there are facilities for processing them in the country. The export of aluminum scrap is high due to the mixed nature of the waste and it is not possible to use it in the manufacturing of finished products. Exported copper scrap can be completely

processed in the country, as well as lead and zinc waste. Depending on their purity, these secondary metals are suitable raw materials both for mining, and metallurgical companies. In 2019 the exported aluminum and copper waste increased by 5.5% and 20.1%, respectively, and pure lead scrap and zinc waste decreased by over 30%.

About 75% of the aluminum waste is directed to EU countries, and to Turkey and India - about 10% of the quantities. The largest importers of copper scrap from Bulgaria are China and Turkey with 46.2% and 36.6% respectively. The quantities of exported lead waste are small, but 65% of them are sold in Romania and about 33% are directed to Serbia. There are Bulgarian investors' capacities for their processing in these countries.

Tables 3.13 and 3.14 show the following conclusions can be made about the state of trade in 2019.

Exported non-ferrous metals and metal products decreased in quantity by 11.3% and in value by more than 984 million leva. This decrease is mainly due to the smaller quantities of anodic and electrolytic copper produced, respectively their sales on foreign markets.

The import also goes down, but to a lesser extent. In quantity - by 4.9%, and in value by 135 million leva. This is due to the smaller supplies of electrolytic copper, copper scrap and rolled aluminum for the Bulgarian market.

The import/exports balance in 2019 shows that Bulgarian non-ferrous metallurgy continues to be export-oriented, the determining factors for this being the existing significant processing capacity, high quality and competitiveness of production and limited domestic consumption.

3.2.3. FOREIGN TRADE TURNOVER OF NON-FERROUS METALS

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

Table 3.15

Foreign trade turnover of non-ferrous metals, tons

Indices	2015	2016	2017	2018	2019		Difference 2019/2018	
					tons	%	+/-	%
Import	268 128	290 573	312 488	320 656	304 968	33.2	-15 688	95.1
Export	650 821	586 760	682 284	693 417	614 745	66.8	-78 672	88.7
Total turnover	918 949	877 333	994 772	1 014 073	919 713	100.0	-94 360	90.7
Balance	382 693	296 187	369 796	372 761	309 777		-62 984	83.1

Source: Customs statistics, NRA

The data on Table 3.15 show that compared to the very successful 2018, the total amount of exported and imported non-ferrous metals, which form the foreign trade turnover decreased by 94 360 tons (9.3%). The reasons for this are mainly the drop in export by 78.7 thousand tons (for copper /anodic and electrolytic/, zinc, aluminum ingots /secondary/ and aluminum foil). At the same time, the import also decreased - by 15.7 thousand tons. The imported quantities of cathode copper, copper scrap and almost all types of R/P aluminum are smaller.

The trade balance in quantity terms, which is formed by the difference between exports and imports, decreased by 63 thousand tons, but remained positive. The export of non-ferrous metals and their products is more than twice higher than their import.

In value terms (Table 3.16) the foreign trade turnover in 2019 also decreased - by 1 241 million leva (15.4%) as a result of the drop in export and to a lesser extent the decrease in imports. Nevertheless, the balance remains positive - 3 423.9 million leva, which has a positive effect on Bulgaria's foreign trade balance.

Table 3.16

Foreign trade turnover of non-ferrous metals, million leva

Indices	2015	2016	2017	2018	2019		Difference 2019/2018	
					tons	%	+/-	%
Import	1 549.0	1 446.5	1 971.9	2 021.7	1 765.5	25.4	-256.2	87.3
Export	5 141.7	4 010.1	6 039.1	6 174.2	5 189.4	74.6	-984.8	84.1
Total turnover	6 690.7	5 456.6	8 011	8 195.9	6 954.9	100	-1 241	84.6
Balance	3 592.7	2 563.6	4 067.2	4 152.5	3 423.9		728.6	82.5

Source: Customs statistics, NRA

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

Table 3.17 presents company information on the sales of Bulgarian production of non-ferrous metals and finished products from them in the period 2015 – 2019.

The sales of **electrolytic copper** on the local market are 16.4% and the export represents 83.6%. Deliveries to the local market increased by 1 812 tons, respectively the import of cathode copper decreased.

Foreign markets have a share of 71.1% in the sales of lead and lead alloys and the domestic market - 28.9%. Compared to 2018 sales on the local market increased by about 7%.

Table 3.17

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

Items	Sales	2015	2016	2017	2018	2019
Anodic copper	Home market	-	-	-	-	-
	Export	118 573	70 793	146 617	129 865	86 703
	Total	118 573	70 793	146 617	129 865	86 703
Electrolytic copper	Home market	28 006	29 033	21 315	32 378	34 190
	Export	208 150	185 006	207 252	191 321	174 330
	Total	236 156	214 039	228 567	223 699	208 520
Lead and alloys	Home market	21 473	27 838	26 293	27 787	29 787
	Export	75 714	72 411	75 157	74 018	73 230
	Общо	97 187	100 249	101 450	101 805	103 017
Zinc and alloys	Home market	12 692	6 690	6 717	6 569	6 473
	Export	57 618	70 615	63 734	66 766	65 825
	Total	70 410	77 305	70 451	73 335	72 298
R/P HNFМ	Home market	1 563	1 619	1 403	1 175	933
	Export	55 890	56 174	70 145	78 668	78 324
	Total	57 453	57 793	71 548	79 843	79 257
R/P aluminum	Home market	8 616	8 054	7 145	7 112	17 887
	Export	73 931	78 553	82 045	83 626	73 117
	Total	82 547	86 607	89 190	90 738	91 004

Source: Company data

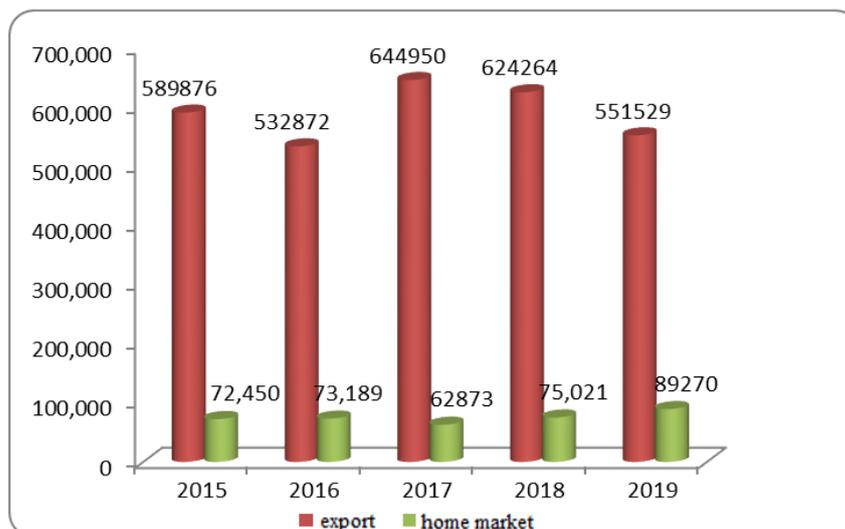
Exported **zinc ingots** decreased slightly - by 940 tons and represented 91% of the total production, and only 9% were sold on the local market.

HNFМ products for the domestic market have been decreasing for three years now and in 2019 they represent only 1.2% of sales. The production is directed mainly for export, which takes up 98.8% of the total volume.

The sales of **aluminum R/P products** on the domestic market in 2019 increased by more than 10 thousand tons, or more than 2.5 times, and exports decreased by more than 10 thousand tons. The ratio between sales on the local market and export is 19.7% /80.3%. (7.8% / 92.2% in 2018).

The quantity of the total sales of non-ferrous metals and R/P metal for the last five years and their realization are presented on Fig.3.15.

Fig 3.15



The total sales on the local market in 2019 accounted for 13.9% of the total sales (respectively 10.7% in 2018). The volume of exported quantities is 551.5 thousand tons (86.1%). There is a tendency for domestic sales to go up.

Figure 3.15 shows that the non-ferrous metallurgy in Bulgaria is an export-oriented sector as the export exceeds the sales on the local market many times.

3.2.5. CONSUMPTION OF NON-FERROUS METALS AND ALLOYS

The real home consumption (RHC) is defined as the sum of the realization on the domestic market (according to data provided by Bulgarian producers) and the import reported by the Customs Agency and the NRA. Data about the RHC in the period 2015 - 2019 is presented on Table 3.18.

In 2018 61.1 % of the domestic consumption of basic non-ferrous metals (copper, lead and zinc) was covered by the local production (55.1 % in 2018) and the share of the imported metals was 38.9 %.

Table 3.18

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

Items	Origin	2015	2016	2017	2018	2019	
						tons	%
Electrolytic copper	Local production	28006	29 003	21 315	32 378	34190	52.8
	Import	12211	20 498	38 994	36 010	24859	47.2
	Consumption	40217	49 501	60 309	68 388	59049	100.0
Lead	Local production	21473	27 793	26 293	27 787	29787	64.3
	Import	8394	16 482	16 203	14 584	16532	35.7
	Consumption	29867	44 275	42 496	42 371	46319	100.0
Zinc	Local production.	12692	6 690	6 717	6 569	6473	65.0
	Import	5322	3 243	656	3 872	3487	35.0
	Consumption	18 014	9 933	7 373	10 441	9960	100.0
R/P NFM	Local production	1563	1 619	1 403	1 175	933	4.7
	Import	14 620	24 543	15 783	17 961	19971	95.3
	Consumption	16 183	26 162	17 186	19 136	20904	100.0
R/P aluminum	Local production	8616	8 054	7 145	7112	17887	32.7
	Import	38663	40 563	45 023	43 574	36867	67.3
	Consumption	47 279	48 617	52 168	50 686	54754	100.0

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

The RHC of electrolytic copper decreased by 13.7%. This is a result of the small drop in production of copper and copper alloy products on one hand, and the increase of the input of secondary copper raw materials. The reduced consumption leads to a drop in imports by 31%, and from local production it increases by 5.6%. Regarding lead, most of the RHC is satisfied by local production (64.3%), and import accounts for 35.7% of the quantities consumed. In 2019 the consumed quantities of lead in the country increase by 4 thousand tons, distributed equally between local production and imported metal.

The data show that the RHC of zinc fluctuates over the years and decreases almost twice in five years. For 2019 it is 9 960 tons, decreasing by 500 tons or 4.6%. The ratio local production/imports is 65% to 35%.

The growth of the Bulgarian economy, respectively of the main consumers of metals such as the processing industry and construction sector, leads to higher consumption of finished metallurgical products.

The true consumption of R/P products from HRFM increased by 9.3%, as the needs are covered mainly by imports - over 95% and only 5% by local production. Most of the imported products are not produced in the country (pipes, wires, foil). The reported growth in R/P aluminum is 8%. Deliveries from local producers take up an increasing share of the domestic market and more than double compared to the previous year.

The Apparent Consumption (AC) is another indicator defined as the sum of the production and the import, reduced by the export. Data about the AC of basic and R/P non-ferrous metals in 2019 are presented on Table 3.19.

Apparent consumption of non-ferrous metals and R/P products in 2019, tons

Items	Production	Import	Export	AC
Electrolytic copper	207196	24859	162028	70027
Lead, incl. alloys	102473	16532	75996	43009
Zinc, incl. alloys	73512	3487	64085	12914
R/P NFM and alloys	79678	19971	76092	23557
R/P Aluminium	92862	36867	88673	41056

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

The two definitions are used as comparative data in practice and the above values have minor deviations. The AC is higher for electrolytic copper and R/P aluminum, the formula of which includes the total production in the country. It should be noted here that the calculations are made only for the companies-members of BAMI. The reason for this is the fact that they are the main producers, with a share of over 95%. Other factors, such as changes in stocks for which there is no data, also have an impact. Despite these differences in the values of the two methods, they are close enough and reflect the trends in consumption and exports. They clearly show that the needs of Bulgarian industry and the domestic sales are significantly below the capacity of the existing production capacities and the actually produced basic non-ferrous metals and metal products. This determines the great export potential of the Bulgarian non-ferrous metallurgy, with a great contribution to the improvement of the foreign trade balance of the country.

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