

EU-MERCI

EU coordinated **ME**thods and procedures based on **Re**al **C**ases for the effective implementation of policies and measures supporting energy efficiency in the **I**ndustry

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Analysis of the industrial sectors in different Countries: Bulgaria

WP4: Picture of efficiency projects implemented by the
Industry sector-by-sector and process-by-process

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1 General Overview of Industry in Bulgaria

The energy intensity of the Bulgarian economy is among the highest in the EU-28 – 448.8 ktoe/1,000 € in 2014. The share of industry in the final energy consumption is about 29%.

In 2008 the Bulgarian Statistical institute Issued "Classification of economic activities 2008" (NACE.BG-2008), which translates the common for the Member States revised classification standard - Statistical Classification of Economic Activities (NACE Rev.2). Although harmonized with the EU classification, the Bulgarian statistics do not provide enough disaggregated data about the economic activities.

Industry is divided into two main categories:

- Mining and quarrying
- Manufacturing

On its side, manufacturing is divided into:

- Manufacture of food products, beverages and tobacco products
- Manufacture of textiles, wearing apparel, leather and related products
- Manufacture of wood and paper products and printing
- Manufacture of coke and refined petroleum products
- Manufacture of chemicals and chemical products
- Manufacture of pharmaceuticals, medicinal chemical and botanical products
- Manufacture of rubber and plastics products and other non-metallic mineral products
- Manufacture of basic metals and fabricated metal products, except machinery
- Manufacture of computer, electronic and optical products
- Manufacture of electrical equipment
- Manufacture of machinery and equipment n.e.c.
- Manufacture of transport equipment
- Manufacture of furniture; other manufacturing; repair and installation of machinery and equipment

For the needs of the current study, data from Eurostat was used, when available, for the economic description of the economic categories.

The energy consumption has been taken from the official national Energy Balance, which divides the economic activities by the following categories:

Industry
Iron and steel industry

Non-ferrous metal industry
Chemical industry
Non-metallic mineral products
Ore-extraction industry
Food, drink and tobacco industry
Textile, leather and clothing industry
Wood and wood products
Paper and printing
Engineering and other metal industry
Transport equipment
Construction
Other industry

2 Food & Beverage sector

The Food & Beverage sector in Bulgaria is defined by NACE codes C10 (Manufacture of food products), C11 (Manufacture of beverages) and C12 (Manufacture of tobacco products).

2.1 Sectoral organization

Food sector is one of the largest in Bulgaria. It is characterized by significant fragmentation and poor horizontal and vertical integration. Food and drink production is regulated by the Food Act, aiming to ensure the compliance of production and marketing of food with regulatory requirements for the protection of health and consumers' interest. The state policy in the field of food safety is implemented by the Minister of Agriculture and Food and the Minister of Health. A National Council is established by the Minister of Agriculture and Food for better functioning of the food supply chain. It encourages the conclusion of agreements between associations of producers and traders of food, gives opinions and recommendations on the problems identified in the food supply chain and the draft legislation, including the implementation of the corresponding regulations.

2.2 Economic indicators

The Bulgarian food and beverages sector covers about 17% of the industrial production in the MS and contributes about 19% of the value added in industry. It provides employment to about 15% of the employees in the manufacturing industry.

In 2014 the manufacture of food and beverages comprised 5,963 enterprises with a total turnover of 4,944.3 million €.

The output of the industrial enterprises from the sector of the manufacture of food products, beverages and tobacco products in 2014 was 4,805.9 million €, or 15.2% of the total economic activities.

The total production value amounted to 4,475,6 million € and the gross value added of 900,4 million €.

The participation of the food manufacturing sector in industrial export is considerable – 7.9%, while the participation of the beverages manufacture sector is about 0.6%.

Table 1: Key economic parameters for the Bulgarian Food and Beverage sector.

Description	NACE (group)	No. of enterprises	No. of people employed	Turnover [mil €]	Value added [mil €]	Production value [mil €]
Manufacture of food products	C10	5,094	81,104	4,057.4	704.6	3,638.8
Processing and	C10.1	484	16,098	1,034.8	129.7	967.6

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preserving of meat and production of meat products						
Processing and preserving of fish crustaceans and molluscs	C10.2	42	1,484	39.5	9.5	40.0
Processing and preserving of fruit and vegetables	C10.3	348	7,091	315.8	63.2	298.5
Manufacture of vegetable and animal oils and fats	C10.4	79	2,791	477.0	55.9	384.5
Manufacture of dairy products	C10.5	299	8,702	508.8	73.6	468.6
Manufacture of grain mill products. starches and starch products	C10.6	124	3,366	373.5	72.0	338.4
Manufacture of bakery and farinaceous products	C10.7	2 958	29,575	601.8	170.8	560.3
Manufacture of other food products	C10.8	656	10,431	507.0	106.2	419.0
Manufacture of prepared animal feeds	C10.9	104	1,566	199.1	24.0	161.8
Manufacture of beverages (provisional)	C11	869	13,631	886.9	195.8	836.8
Distilling. rectifying and blending of spirits	C11.01	388	2,297	166.6	9.4	157.2
Manufacture of wine from grape	C11.02	190	3,754	128.0	26.3	127.1
Manufacture of cider and other fruit wines	C11.03	51	55	0.1	0.1	0.1

Manufacture of other non-distilled fermented beverages	C11.04	N/A	N/A	N/A	N/A	N/A
Manufacture of beer	C11.05	13	2,353	254.0	64.1	251.9
Manufacture of malt	C11.06	N/A	N/A	N/A	N/A	N/A
Manufacture of soft drinks; production of mineral waters and other bottled waters	C11.07	220	5,073	391.6	93.5	286.1

2.3 Energy consumption

Table 2: Bulgaria, Final energy consumption of Food, drink and tobacco industry (1,000 toe).

Total	Coal	Coal fuels	Natural gas	Crude oil, feedstocks and additives for refinery	Petroleum products	RES and wastes	Geothermal energy	RES-e	Nuclear energy	Heat	Electricity
246	1	-	93	-	10	27	-	-	-	12	103

3 Pulp & Paper sector

The sector is defined by NACE codes C17.1 (Manufacture of pulp, paper and paperboard), C17.11 (Manufacture of pulp), C17.12 (Manufacture of paper and paperboard) and C17.2 (Manufacture of articles of paper and paperboard). In some official statistical data this sector is referred to as “Manufacture of wood and paper products and printing”.

3.1 Sectoral organization

Information had not been found by the time the document was prepared.

3.2 Economic indicators

The sector for manufacture of paper and paper products and cardboard covers about 1.7% of industrial production in the country and creates about 2.0% of value added in industry. It provides employment to approx. 1.7% of the employees in industry.

In 2014 the number of enterprises in the studied group was 16 and their total turnover was 169.0 million €.

The output of the industrial enterprises from the whole sector covered in “Manufacture of wood and paper products and printing” and in 2014 was 1,290.7 million € or 4.1% of the total economic activities.

The total production value of the studied group amounted to 179.0 million € and the gross value added – 40.1 €million.

The share of the manufacture of paper, paper products and cardboard in the total industrial export is about 1.5%.

Table 3: Key economic parameters for the Bulgarian Pulp and Paper sector.

Descrip tion	NACE (group)	No. of enterprises	No. of persons employed	Turnover [mil €]	Value added [mil €]	Production value [mil €]
Manufa cture of pulp, paper and paperb oard	C17.1	16	1,672	169.0	40.1	179.0
Manufa cture of pulp	C17.11	N/A	N/A	N/A	N/A	N/A
Manufa cture of paper	C17.12	N/A	N/A	N/A	N/A	N/A

and paperboard						
Manufacture of articles of paper and paperboard	C17.2	472	7,573	344.8	323.6	83.3

3.3 Energy consumption

Table 4: Bulgaria, Final energy consumption of Paper and printing industry (1,000 toe).

Total	Coal	Coal fuels	Natural gas	Crude oil, feedstocks and additives for refinery	Petroleum products	RES and wastes	Geothermal energy	RES-e	Nuclear energy	Heat	Electricity
243	-	-	46	-	-	161	-	-	-	-	35

4 Petroleum refineries sector

The sector is defined by NACE code C19 (Manufacture of coke and refined petroleum products).

4.1 Sectoral organization

Information had not been found by the time the document was prepared.

4.2 Economic indicators

The statistics does not provide information about this sector. The only figures mentioned refer to the number of enterprises (13) and the number of persons employed (2,129).

Table 5: Key economic parameters for the Bulgarian Petroleum refineries sector.

Description	NACE (group)	No. of enterprises	No. of persons employed	Turnover [mil €]	Value added [mil €]	Production value [mil €]
Manufacture of coke and refined petroleum products	C19	13	2,129	N/A	N/A	N/A
Manufacture of coke oven products	C19.1	0	0	0.0	0.0	0.0
Manufacture of refined petroleum products	C19.2	13	2,129	N/A	N/A	N/A

4.3 Energy consumption

Table 6: Bulgaria, Final energy consumption of coke and refined petrol products (1,000 toe).

Total	Coal	Coal fuels	Natural gas	Crude oil, feedstocks and additives for refinery	Petroleum products	RES and wastes	Geothermal energy	RES-e	Nuclear energy	Heat	Electricity
448	-	-	42	-	359	-	-	-	-	-	47

5 Chemical sector

The chemical sector in Bulgaria is defined by NACE code C20 (Manufacture of chemicals and chemical products).

5.1 Sectoral organization

In the period before 1989 (and early 1990-ies), Bulgaria was a leader in the manufacture and export of chemical products such as soda ash, phosphorus and nitrogen fertilizers and medicinal products. After 1989 many foreign companies showed interest and invested in the big Bulgarian chemical plants. Apart from them, during the transition period a great number of small enterprises were established, especially in the sector of rubber products. The crisis closed many of them. In 1994 a Chemical Industry Chamber was created, representing and protecting the interests of its members and the sector. A Professional Association “Chemistry and industry” represents and defends the rights of the workers in the sector.

5.2 Economic indicators

The sector produces about 4.5% of the total industrial production in the MS and contributes 4.7% of value added in industry. It provides employment to approximately 2.6% of the employees in industry.

In 2014 the manufacture of chemicals comprised 586 enterprises with a total turnover of 1,407,1 million €. The output of the industrial enterprises from the sector in 2014 was 1,262.5 million € or 4% of the total economic activities. The total production value amounted to 1,265.6 million € and the gross value added – 304.6 million €.

The participation of the sector in foreign trade is 5,6% of the total exports.

Table 7: Key economic parameters for the Bulgarian Chemical sector.

Description	NACE (group)	No. of enterprises	No. of persons employed	Turnover [mil €]	Value added [mil €]	Production value [mil €]
Manufactur e of chemicals and chemical products	C20	586	13,774	1,407.1	304.6	1,265.6
Manufactur e of basic chemicals. fertilisers and nitrogen compounds	C20.1	114	4,074	755.7	167.2	686.3

. plastics and synthetic rubber in primary forms						
Manufacture of pesticides and other agrochemical products	C20.2	18	318	N/A	6.8	N/A
Manufacture of paints, varnishes and similar coatings, printing ink and mastics	C20.3	72	1,507	91.9	17.0	74.4
Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations	C20.4	194	5,288	295.2	79.1	287.9
Manufacture of other chemical products	C20.5	183	2,100	212.2	31.1	176.2
Manufacture of man-made fibres	C20.6	5	487	N/A	3.3	N/A

5.3 Energy consumption

Table 8: Bulgaria, Final energy consumption of Chemical industry (1,000 toe).

Total	Coal	Coal fuels	Natural gas	Crude oil, feedstocks and additives for refinery	Petroleum products	RES and wastes	Geothermal energy	RES-e	Nuclear energy	Heat	Electricity
872	100	4	319	-	15	10	-	-	-	310	114

6 Non-metallic minerals sector

6.1 Glass

The glass sector in Bulgaria is defined by NACE Code 23.1 (Manufacture of glass and glass products), part of the manufacture of non-metallic mineral products (C23). This includes the manufacturing of flat glass, hollow glass, glass fibres and other glass products. The other sections within the non-metallic mineral products sector are listed in section 6 (ceramic & cement).

6.1.1 Sectoral organization

Information had not been found by the time the document was prepared.

6.1.2 Economic indicators

The whole sector (C23) produces about 6-7% of the total industrial production in the country and contributes about 7% of value added in industry.

In 2014 the manufacture of glass and glass products comprised 121 enterprises with a total turnover of 379.1 million €.

The output of the industrial enterprises from the Manufacture of rubber and plastics products and other non-metallic mineral products in 2014 was 2,421.7 million € or 7.6% of the total economic activities.

The total production value amounted to 365.4 million € and the gross value added of 95.9 million €.

The participation of the sector in foreign trade is 2.8% of the total exports.

Table 9: Key economic parameters for the Bulgarian Glass sector.

Description	NACE (group)	No. of enterprises	No. of persons employed	Turnover [mil €]	Value added [mil €]	Production value [mil €]
Manufacture of glass and glass products	C23.1	121	4,650	379.1	95.9	365.4
Manufacture of flat glass	C23.11	N/A	N/A	N/A	N/A	N/A
Shaping and processing of flat glass	C23.12	63	725	24.3	6.7	22.3
Manufacture of hollow glass	C23.13	11	1,841	153.3	51.4	153.1

Manufacture of glass fibres	C23.14	N/A	N/A	N/A	N/A	N/A
Manufacture and processing of other glass, including technical glassware	C23.15	42	381	19.1	3.3	14.6

6.1.3 Energy consumption

Information about the energy consumption of glass production is not available. The Bulgarian statistics provides total data for the whole NACE C23 (category covering production of glass, refractory products, cement, porcelain, bricks, tiles, concrete etc.):

Table 10: Bulgaria, Final energy consumption of Non-metallic mineral products(1,000 toe) (2015).

Total	Coal	Coal fuels	Natural gas	Crude oil, feedstocks and additives for refinery	Petroleum products	RES and wastes	Geothermal energy	RES-e	Nuclear energy	Heat	Electricity
533	73	-	252	-	91	41	-	-	-	-	76

6.2 Ceramic & Cement sector

The sector is defined by NACE codes C23.2 (Manufacture of refractory products), C23.3 (Manufacture of clay building material), C23.4 (Manufacture of other porcelain and ceramic products), C23.5 (Manufacture of cement, lime and plaster), C23.6 (Manufacture of articles of concrete, cement and plaster), C23.7 (Cutting, shaping and finishing of stone), C23.9 (Manufacture of abrasive products and non-metallic mineral products). It is part of Manufacture of non-metallic mineral products (C23), which in the Figures provided by the Bulgarian statistics combines Manufacture of rubber and plastics products and other non-metallic mineral products.

6.2.1 Sectoral organization

Information had not been found by the time the document was prepared.

6.2.2 Economic indicators

The whole sector (C23) produces about 6-7% of the total industrial production in the country and contributes about 7% of value added in industry. In 2014 the manufacture of ceramic and cement comprised 11 enterprises with a total turnover of 12.5 million €. The output of the industrial enterprises from the Manufacture of rubber and plastics products and other non-metallic mineral

products in 2014 was 2,421.7 million € or 7.6% of the total economic activities. In 2014 the total production value amounted to 11.3 million € and the gross value added – 4.7 million €. The participation of the sector in foreign trade is 2.8% of the total exports.

Table 11: Key economic parameters for the Bulgarian Ceramic and Cement sector.

Description	NACE (group)	No. of enterprises	No. of persons employed	Turnover [mil €]	Value added [mil €]	Production value [mil €]
Manufacture of refractory products	C23.2	11	454	12.5	4.7	11.3
Manufacture of clay building material	C23.3	41	2,290	118.1	49.0	113.4
Manufacture of other porcelain and ceramic products	C23.4	153	1,804	55.4	18.0	53.7
Manufacture of cement, lime and plaster	C23.5	56	1,516	171.1	56.4	176.7
Manufacture of articles of concrete, cement and plaster	C23.6	470	6,231	314.5	66.8	290.9
Cutting, shaping and finishing of stone	C23.7	264	1,819	37.8	11.1	31.8
Manufacture of abrasive products and non-metallic mineral products	C23.9	198	3,408	189.3	57.6	180.7

6.2.3 Energy consumption

Information about the energy consumption of ceramic and cement branches is not available. The Bulgarian statistics provide total data for the whole NACE C23 (category covering production of glass, refractory products, cement, porcelain, bricks, tiles, concrete etc., pls. see Table 10)

Resource efficiency of the cement industry: 3% of energy in cement kilns comes from alternative fuels, which is 8.7% from biomass (e.g. animal meal, sewage dust, sawdust, waste wood) and 25.6% from other waste (e.g. end-of-life tyres (1.1 million metric tonnes annually in EU), waste oil, solvents). The industry aims to increase the use of alternative fuels to 60% by 2050 (of which 40% biomass), thus reducing the recourse to primary fuels (petcoke, oil) to 40%.

7 Iron & Steel sector

The Iron & Steel sector is defined by NACE code C24.1 (Manufacture of basic iron and steel and of ferro-alloys), C24.2 (Manufacture of tubes, pipes, hollow profiles and related fittings, of steel), C24.3 (Manufacture of other products of first processing of steel), C24.51 (Casting of iron) and C24.52 (Casting of steel).

7.1 Sectoral organization

Metallurgical industry in Bulgaria is fully privatized. After 2011 many enterprises in the sector of ferrous metallurgy have closed and currently the sector produces a limited range of steel products. Import is considerable and the share of the crude steel production of Bulgaria in the EU is 0.3%. In 1991 an association of the metallurgical industry was established by the employers in the metallurgical sector and the collateral production, activities and services.

7.2 Economic indicators

The sector “Manufacture of basic metals” produces about 14.9% of the total industrial production in the country and contributes 9% of value added in industry. It provides employment to approx. 2.2% of the employees in industry.

In 2014 the number of enterprises in the sector was 189 and their total turnover was 3,884.5 million €.

The output of the industrial enterprises from the sector in 2014 was 5,307.1 million € or 16.7% of the total economic activities.

The total production value amounted to 3,753.9 million € and the gross value added of 304.3 million €.

The production of basic metals is a leading export industrial sector. In 2013 its share of C24 was 17.8% of the total exports.

Table 12: Key economic parameters for the Bulgarian Iron and Steel sector.

Description	NACE (group)	No. of enterprises	No. of persons employed	Turnover [mil €]	Value added [mil €]	Production value [mil €]
Manufacture of basic metals	C24	189	11,529	3,884.5	304.3	3,753.9
Manufacture of basic iron and steel and of	C24.1	3	1,601	551.1	24.6	456.6

ferro-alloys						
Manufacture of tubes, pipes, hollow profiles and related fittings, of steel	C24.2	23	979	78.1	12.1	72.8
Manufacture of other products of first processing of steel	C24.3	16	319	38.2	0.1	29.5
Casting of iron	C24.51	42	2,402	71.4	19.8	68.9
Casting of steel	C24.52	12	782	15.4	5.9	16.4

7.3 Energy consumption

The total energy consumption in metallurgy amounts to 257 thousand toe representing some 10% of the MS's total. This consumption is distributed between the two subsectors at 57% in the non-ferrous metallurgy and 43% in the ferrous metallurgy.

Table 13: Bulgaria, Final energy consumption of Iron and Steel industry (1,000 toe).

Total	Coal	Coal fuels	Natural gas	Crude oil, feedstocks and additives for refinery	Petroleum products	RES and wastes	Geothermal energy	RES-e	Nuclear energy	Heat	Electricity
110	-	-	49	-	-	-	-	-	-	-	61

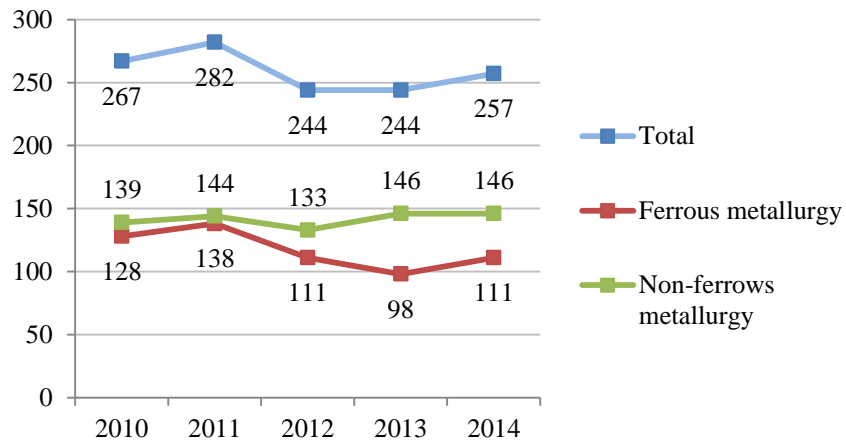


Figure 1: Dynamics of the energy consumption in metallurgy (1,000 toe).

8 Other metals sector

The sector is defined by NACE codes C24.4 (Manufacture of basic precious and other non-ferrous metals), C24.53 (Casting of light metals), C24.54 (Casting of other non-ferrous metals).

8.1 Sectoral organization

Non-ferrous metallurgy is well developed and competitive, specialized in the production of copper, zinc, lead and the accompanying products. The sector is export-oriented, forms a positive balance and keeps good positions in the world trade exchange.

8.2 Economic indicators

The information found relates to the entire NACE C24 (see 7.2).

Table 14: Key economic parameters for the Bulgarian Other metals sector.

Description	NACE (group)	No. of enterprises	No. of persons employed	Turnover [mil €]	Value added [mil €]	Production value [mil €]
Manufacture of basic precious and other non-ferrous metals	24.4	45	4,965	3,116.5	237.0	3,095.9
Precious metals production	24.41	12	N/A	3.7	1.0	3.3
Aluminium production	24.42	N/A	1,548	242.2	28.9	231.7
Lead, zinc and tin production	24.43	11	1,666	405.7	45.6	376.5
Copper production	24.44	11	1,597	N/A	N/A	N/A
Other non-ferrous	24.45	N/A	N/A	N/A	N/A	N/A

metal production						
Processing of nuclear fuel	24.46	0	0	0.0	0.0	0.0
Casting of light metals	24.53	22	363	10.2	3.7	10.1
Casting of other non-ferrous metals	24.54	26	118	3.6	1.0	3.6

8.3 Energy consumption

Table 15: Bulgaria, Final energy consumption of Non-ferrous metal industry (1,000 toe).

Total	Coal	Coal fuels	Natural gas	Crude oil, feedstocks and additives for refinery	Petroleum products	RES and wastes	Geothermal energy	RES-e	Nuclear energy	Heat	Electricity
133	-	1	32	-	13	-	-	-	-	13	74

9 Machinery sector

The sector is defined by NACE codes C25 (Manufacture of fabricated metal products, except machinery and equipment), C26 (Manufacture of computer, electronic and optical products), C27 (Manufacture of electrical equipment) and C28 (Manufacture of machinery and equipment).

9.1 Sectoral organization

Information had not been found by the time the document was prepared.

9.2 Economic indicators

The “*Manufacture of fabricated metal products, except for machinery and equipment*” sector produces 5.1% of the total production and contributes 8.5% of value added in industry. The branch employs 10,2% of the total employees in industry.

The number of enterprises in the sector is 3,583 with a total turnover of 1,618 million €. In 2014 the total production value of the sector amounted to 1,553.3 million € and the gross value added – 521.4 million €.

The share of the sector in export is about 2.7%.

The “*Manufacture of computer, electronic and optical products*” sector produces about 1.2% of the total production and contributes 2.4% of value added in industry. The sector employs about 1.6% of the total employees in industry.

In 2014 the number of enterprises in the sector was 366 and their total turnover amounted to 377.4 million €. The total production value of the sector amounted to 372.6 €million and the gross value added of 157 million €.

The output of the industrial enterprises from the sector in 2014 was 3,726 million € or 1.2% of the total economic activities.

The share of the sector in export of industry products is about 3,6%.

The “*Manufacture of electrical equipment*” sector produces about 4.1% of the total production and contributes 4.3% of value added in industry. The employees in the sector constitute about 3.8% of the total employees in industry.

In 2014 the number of enterprises in the sector was 366 and their total turnover amounted to 377.4 million €. The total production value of the sector amounted to 372.6 million € and the gross value added of 157 million €.

The output of the industrial enterprises from the sector in 2014 was 3,726 million € or 1.2% of the total economic activities.

The share of the sector in export of industry products is about 3.6%.

The “*Manufacture of electrical equipment*” sector produces about 4.1% of the total production and contributes 4.3% of value added in industry. The employees in the sector constitute about 3.8% of the total employees in industry.

In 2014 the number of enterprises in the sector was 494, with a total turnover of 1,254.5 million €. The total production value of the sector amounted to 1,194 million € and the gross value added of 275.9 million €.

The output of the industrial enterprises from the sector in 2014 was 1,194 million € or 3.8% of the total economic activities.

The share of the sector in export of industry products is about 7.1%.

The “*Manufacture of machinery and equipment*” sector produces about 4.5% of the total production and contributes about 6.8% of value added in industry. It employs about 5.8% of the total employees in industry.

In 2014 the number of enterprises in the sector was 906, with a total turnover of 1,360 million €. The total production value of the sector amounted to 1,304 million € and the gross value added of 405.4 million €.

The output of the industrial enterprises from the sector in 2014 was 1,103.9 million € or 4.1% of the total economic activities.

The share of the sector in export of industry products is about 7.7%.

Table 16: Key economic parameters for the Bulgarian Machinery sector.

Description	NACE (group)	No. of enterprises	No. of persons employed	Turnover [mil €]	Value added [mil €]	Production value [mil €]
Entire metal products, machinery and equipment industry	25, 26, 27, 28					
Manufacture of fabricated metal products, except machinery and equipment	C25	3,583	54,521	1,618.0	521.4	1,553.3
Manufacture of	C25.1	1,063	11,748	389.0	92.5	380.6

structural metal products						
Manufacture of tanks, reservoirs and containers of metal	C25.2	67	2,310	85.6	25.6	82.4
Manufacture of steam generators, except central heating hot water boilers	C25.3	9	148	3.5	1.2	3.0
Manufacture of weapons and ammunition	C25.4	20	11,839	246.7	121.9	246.2
Forging, pressing, stamping and roll-forming of metal; powder metallurgy	C25.5	28	547	20.5	5.9	20.7
Treatment and coating of metals; machining	C25.6	1,234	13,051	398.6	121.8	367.5
Manufacture of cutlery, tools and general hardware	C25.7	104	3,280	96.4	43.0	93.2
Manufacture of other fabricated metal products	C25.9	1,058	11,598	377.7	109.4	359.7
Manufacture of computer, electronic and optical products	C26	366	8,767	377.4	157.0	372.6
Manufacture of electronic	C26.1	105	3,175	116.7	46.9	119.1

components and boards						
Manufacture of computers and peripheral equipment	C26.2	30	354	19.9	6.2	17.3
Manufacture of communication equipment	C26.3	56	1,182	47.3	24.3	47.4
Manufacture of consumer electronics	C26.4	18	371	10.8	5.3	11.5
Manufacture of instruments and appliances for measuring, testing and navigation; watches and clocks	C26.5	112	1,864	78.2	30.6	78.7
Manufacture of irradiation, electromedical and electrotherapeutic equipment	C26.6	10	323	50.1	22.8	48.2
Manufacture of optical instruments and photographic equipment	C26.7	31	1,438	51.4	19.7	47.6
Manufacture of magnetic and optical media	C26.8	4	60	3.0	1.2	2.8
Manufacture of electrical equipment	C27	494	20,951	1,254.5	275.9	1,194.0
Manufacture of electric motors,	C27.1	158	8,279	404.4	98.5	375.5

generators and transformers and electricity distribution and control apparatus						
Manufacture of batteries and accumulators	C27.2	11	1,036	191.2	38.0	176.5
Manufacture of wiring and wiring devices	C27.3	62	3,549	153.1	30.3	154.1
Manufacture of electric lighting equipment	C27.4	77	1,153	36.2	9.4	34.1
Manufacture of electric domestic appliances	C27.5	55	3,830	276.5	54.1	266.2
Manufacture of other electrical equipment	C27.9	131	3,104	193.0	45.4	187.6
Manufacture of machinery and equipment	C28	906	31,271	1,360.0	405.4	1,304.0
Manufacture of general-purpose machinery	C28.1	84	10,520	534.6	153.3	503.0
Manufacture of other general-purpose machinery	C28.2	355	11,775	476.6	130.0	455.7
Manufacture of agricultural and forestry machinery	C28.3	54	1,177	28.7	12.0	28.5
Manufacture	C28.4	74	1,925	84.6	24.4	83.9

re of metal forming machinery and machine tools						
Manufacture of other special-purpose machinery	C28.9	339	5,874	235.6	85.7	232.9

9.3 Energy consumption

Table 17: Bulgaria, Final energy consumption of Engineering and other metal industry (1,000 toe).

Total	Coal	Coal fuels	Natural gas	Crude oil, feedstocks and additives for refinery	Petroleum products	RES and wastes	Geothermal energy	RES-e	Nuclear energy	Heat	Electricity
125	-	-	38	-	6	-	-	-	-	-	81

10 Energy statistics

10.1 Energy consumption

Table 18: Final energy consumption in Bulgaria (ktoe).

	2010	2011	2012	2013	2014	2015
FEC	8,843.1	9,262.5	9,240.3	8,778.4	9,011.9	9,507.6
FEC - industry	2,560.9	2,700.9	2,581.8	2,585.9	2,620.3	2,713.3

During the period 2000–2009, the Bulgarian Industry sector registered a steady rapid decrease in energy consumption and energy intensity. In 2009 the energy consumption in the sector decreased by almost 30% for just one year.

Due to the crisis, after 2009 the positive downward trend in energy intensity reduction stalled and remained at that level till 2014. In 2014 the energy consumption and energy intensity remained at the levels of 2013.

The energy consumption slightly increased – from 2,576 ktoe in 2013 to 2,606 ktoe in 2014. The energy intensity of the sector in 2014 remained at the same level as in the previous year, i.e. 0.1376 kgoe/BGN GDP at 2010 prices in 2013 and 0.1382 kgoe/BGN GDP at 2010 prices in 2014.

In 2013, energy consumption decreased in the non-ferrous metals industry, the chemical industry and the production of construction materials and increased in the ferrous metals industry, timber processing and cellulose and paper production. In terms of energy sources used, the proportion of energy from coal and heating power decreased and that of energy from renewable sources, waste and electricity increased.

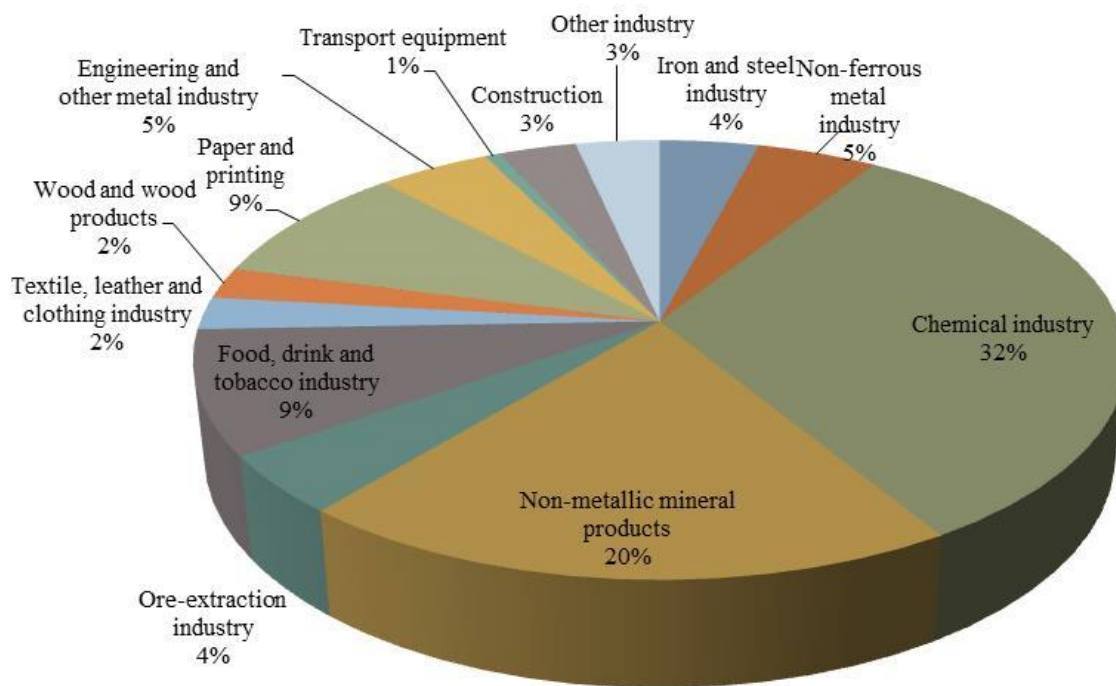


Figure 2: Shares of industrial sectors in the final energy consumption in 2015.

10.2 Energy prices

The energy prices are defined by the Energy and Water Regulatory Commission according to the provision of the Energy Act.

Table 19: Electricity prices for industry during the period July – December 2016 (€).

Groups of industrial consumers	Annual electricity consumption, thousands kWh		Without duties, taxes, VAT	All duties, taxes and VAT included
	Minimum	Maximum		
11	<20		0.108	0.131
12	20	<500	0.094	0.114
13	500	<2,000	0.078	0.095
14	2,000	<20,000	0.069	0.084
15	20,000	<70,000	0.061	0.075
16	70,000	≤150,000	0.056	0.069
17	>150,000		0.057	0.069

10.3 Carbon dioxide conversion factors

The indicators for carbon dioxide factors are established in the Ordinance Nr.E-RD-04-2 of 22 January 2016 on the indicators for energy consumption and energy performance of buildings.

Table 20: Factors of ecological equivalence.

Type of energy resource/energy	Factor of ecological equivalence [gCO ₂ /kWh]
Motor gasoline, petrol, diesel	267
Residual fuel oil	279
Natural gas	202
Propane gas	227
Bituminous coal	341
Lignite coal	364
Anthracite coal	354
Briquettes	351
Wood pellets, briquettes, wood	43
Heat from district heating plants	290
Electricity	819

10.4 Conversion factors to primary energy

The conversion factors to primary energy are established in the Ordinance Nr.E-RD-04-2 of 22 January 2016 on the indicators for energy consumption and energy performance of buildings.

Table 21: Conversion factors to primary energy.

Type of energy resource/energy	Coefficient e _p
Motor gasoline, petrol, diesel	1.1
Residual fuel oil	1.1
Natural gas	1.1
Propane gas	1.1
Bituminous coal	1.2
Lignite coal	1.2
Anthracite coal	1.2
Briquettes	1.25
Wood pellets, briquettes, wood	1.05
Heat from district heating plants	1.30
Electricity	3.0