

# STEEL INDUSTRY IN POLAND – TRENDS IN PRODUCTION, EMPLOYMENT AND PRODUCTIVITY IN THE PERIOD FROM 2004 TO 2019

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The publication presents the key trends in production, employment and productivity in Polish steel industry. Analysis was realized on the base of statistical data in the period from 2004 to 2019. The publication presents the results of statistical analysis and the dependences between analyzed trends. The end of analyses is 2019 year, so the actual situation in Polish steel industry is presented in the publication.

*Key words:* steel industry, production, employment, productivity, Poland

## INTRODUCTION

The steel industry in Poland is one of the key production industry in the national economy. The share of the steel industry in Polish industry is 3 %. The value of annual sales production is approximately PLN 40 billion (per year). Number of production plants in Polish steel industry: 2 steel mills (with BOF technology), 7 steel mills (with EAF technology), 27 rolling mills [1]. Number of suppliers in Polish steel industry: 13,5 thousand (suppliers from country and abroad). Number of customers in Polish steel industry: 6,5 thousand (in 2018) [1].

The data presented in the publication are about: steel production, employment and productivity in Polish steel industry for the period from 2004 to 2019. Questions asked in the publication:

- 1) How much steel was produced in Poland in 2004-2019?



**Figure 1** Trends of steel production and steel products consumption in Poland in the period from 2004 to 2019

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- 2) How much steel was consumed in Poland in 2004-2019?
- 3) What was the structure of Polish steel market in 2004-2019: imports + supplies from the EU and domestic supplies?
- 4) How many employees were employed in Polish steel industry in 2004-2019?
- 5) What was the productivity (efficiency) in Polish steel industry in 2004-2019?

In addition, the latest data about steel production in Poland in 2019 were presented and indicated on some problems in Polish steel industry last year.

## STEEL PRODUCTION AND STEEL CONSUMPTION IN POLAND

Since 2005, the advantage of consumption over production has begun in Polish steel industry. In 2005, more steel was consumed than produced. Only in 2004 steel production was higher than consumption of steel products (Figure 1) [1-2].

The difference between steel production and consumption of steel products in Polish industry was the highest in 2018 (4 735 thousand tonnes) – Table 1. The difference between the consumption of steel products and steel production in the period from 2004 to 2019 was 22 744 thousand tonnes (Figure 2). Higher consumption of steel products than steel production was covered by imports and supplies of steel products from EU countries [1].

The structure of steel market in Poland was presented in the Figure 3. The share of imports in the consumption of steel products in Poland is increasing (from 52 % in 2006 to 73 % in 2019)-Table 2. Since 2016, the share of imports in domestic steel consumption has exceeded 70 % [1].

Table 1 **Steel production and steel products consumption in Poland in the period from 2004 to 2019**

Year	Steel production	Steel products consumption	(2)minus(1)
	/thousand tonnes		
No. Column	(1)	(2)	(3)
2004	10 593	9 200	-1 393
2005	8 444	8 374	-70
2006	9 992	10 662	670
2007	10 632	12 051	1 419
2008	9 728	11 517	1 789
2009	7 129	8 194	1 065
2010	7 993	9 952	1 959
2011	8 779	11 021	2 242
2012	8 358	10 406	2 048
2013	7 950	10 397	2 447
2014	8 540	12 278	3 738
2015	9 198	12 560	3 362
2016	9 001	13 150	4 149
2017	10 330	13 600	3 270
2018	10 165	14 900	4 735
1-10'19	8 300	12 200	3 900
2019	8 956	13 607	4 651

Table 2 **The share of import plus bring and domestic supply in the structure of Polish steel market in the period from 2004 to 2019**

Year	Import + bring	Domestic supply
	/ %	
2004	43	57
2005	53	47
2006	52	48
2007	59	41
2008	63	37
2009	59	41
2010	63	37
2011	64	36
2012	68	32
2013	67	33
2014	68	33
2015	67	33
2016	70	30
2017	71	29
2018	72	28
1-10'19	74	26
2019	73	27

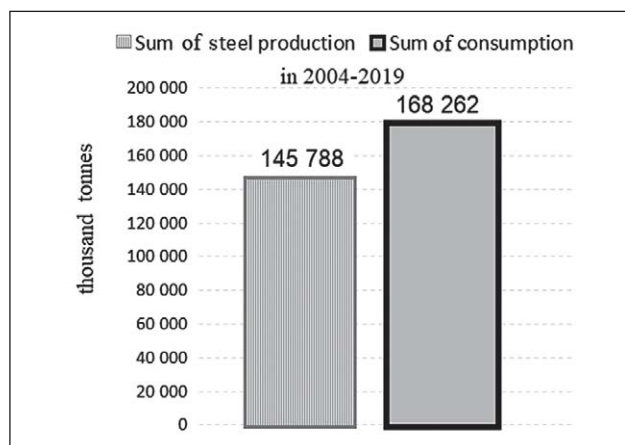


Figure 2 Sum of steel production and steel products consumption in Poland in the period from 2004 to 2019

Generally the share of technology BOF in total production in more than 50 % (few points above the level 50 %). The share of EAF technology in less than 50 % (few points below 50 %).

## EMPLOYMENT IN STEEL INDUSTRY IN POLAND

Until 2015, the number of employees in Polish steel industry had decreased. In 2015, the steel industry employed just over 20 000 people. In the years that followed, there was an increase in employment. In 2018, Polish steel industry employed 24 000 employees (data from Polish Steel Association). In 2019, there was a slight decrease in employment because there are not production in steelworks Czestochowa and Krakow (excluding) - forecasts: 23 500 or 23 200. On the base of data from The European Steel Association (EUROFER) - Report April 2017, in 2016 employment in steel industry in Poland was 21 700 [10].

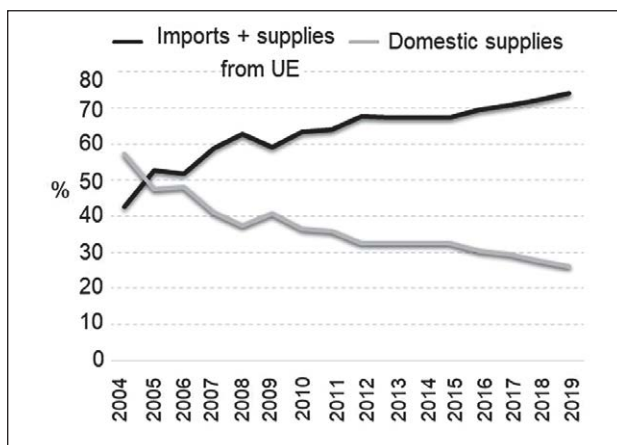


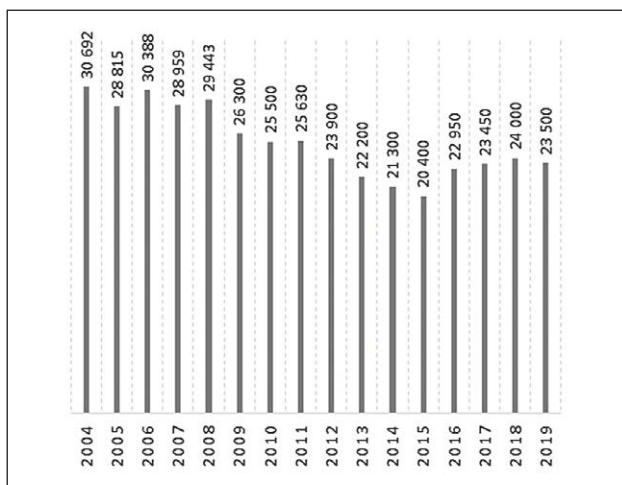
Figure 3 Structure of steel market in Poland in the period from 2004 to 2019

The development of Polish steel industry affects employment growth in other sectors of industry. It is estimated that in Poland it is 150 000 additional jobs in the economy.

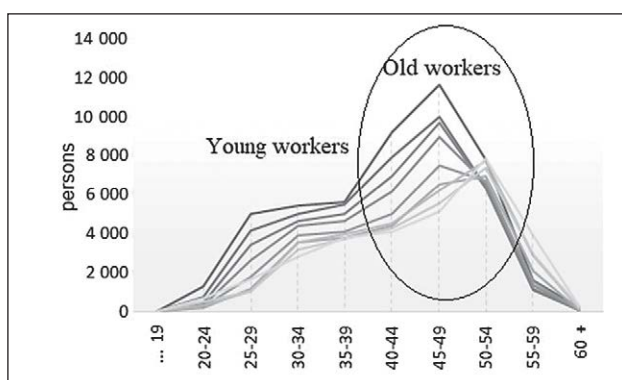
The Figure 4 shows the number of employees in steel industry in Poland in the period from 2004 to 2019 [3]. Some data are estimates (statistical institutions do not keep employment records in Polish steel industry but they use the classification EKD).

The employment structure has increased over the past two decades with the number of old workers (45+, 50+) and the number of young workers has decreased. This situation was called a generation gap. The share of employees aged 45 and more in total employment exceeded about 50 % in some steel mills [4]. The situation is shown in Figure 5 (only employees worked directly in production are analysed in the Figure). Over the last few years, due to a slight increase in the number of employees, the level of generation gap is lower.

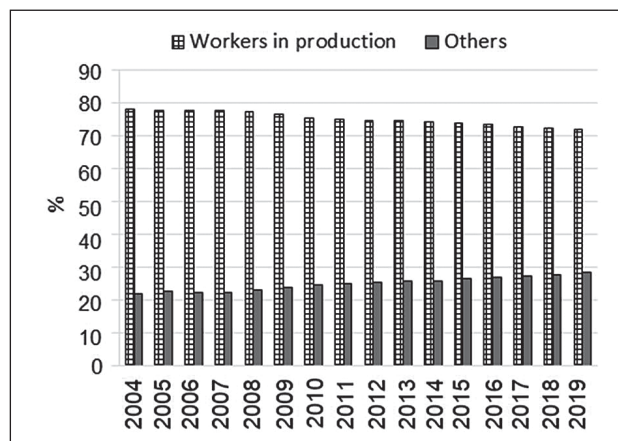
In the period from 2004 to 2019, the form of work changed. Computers and automation have resulted in a



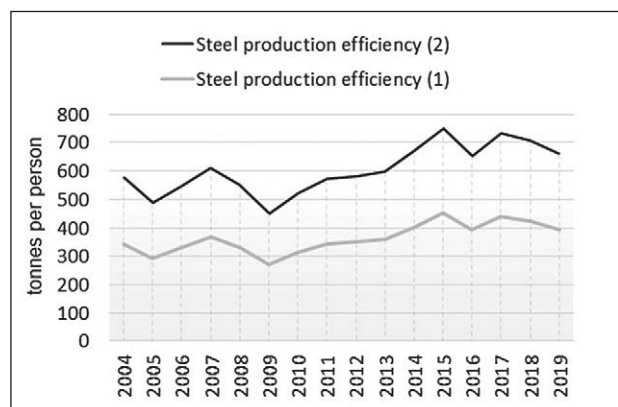
**Figure 4** Employment in steel industry in Poland in the period from 2004 to 2019



**Figure 5** Generation gap in steel industry in Poland in the period from 2004 to 2019



**Figure 6** Employees according to kind of work in steel industry in Poland in the period from 2004 to 2019



**Figure 7** Efficiency in steel industry in Poland in the period from 2004 to 2019

decrease in the number of directly productive workers and an increase employees in services of production e.g. TPM, as well as employees in IT and administration. The former 3:1 ratio (production workers for non-production workers) changed (3:1,5) or even 3:2 (if service personnel and employees in self-employed production positions are among the non-physical staff (not manual activities)). The Figure 6 shows the share of employees according to the work in Polish steel industry in Poland. In analyzed time period the number of workers directly employed in production decreased from 80 % to 68 %, with a tendency to further fall to 60 % [3].

### PRODUCTIVITY IN STEEL INDUSTRY IN POLAND

There are many ways to count the production efficiency – productivity [5-8]. In the publication such formula is used: (1):

$$\text{Production efficiency} = \frac{\text{steel production}}{\text{employment (total)}} \quad (1)$$

The calculated indicator is shown in Figure 7. Production capacity is about 400 tonnes of steel per employee in Polish steel industry. The capacity (efficiency) per production worker (formula 2) is higher and is 600 tonnes of steel per employee.

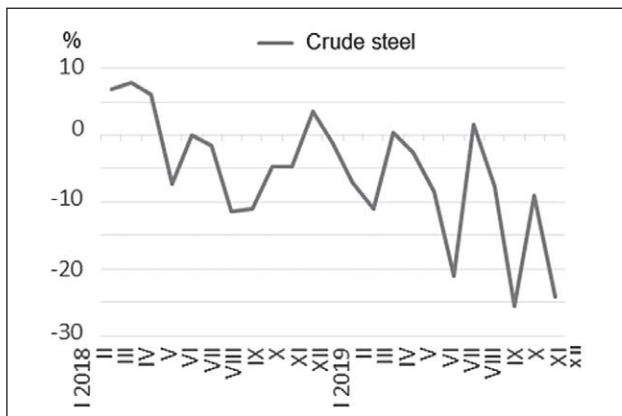
$$\text{Production efficiency} = \frac{\text{steel production}}{\text{employment in production only}} \quad (2)$$

### SITUATION AND SOME PROBLEMS IN POLISH STEEL INDUSTRY IN 2019

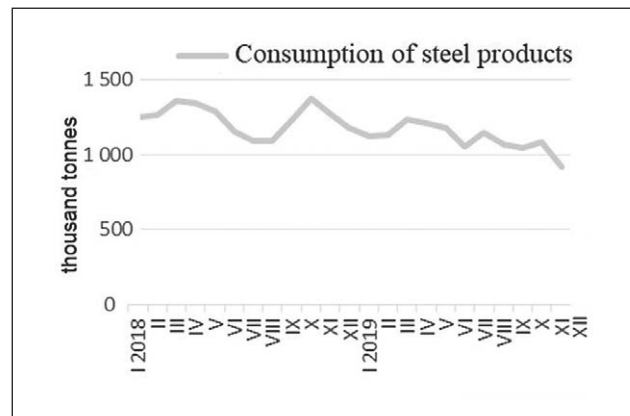
Production of raw steel in Poland from January to December 2019 was 8 956 thousand tonnes, thousand tonnes of raw In 2018, 10 165 thousand tonnes of steel were produced. Comparing 2018 and 2019, crude steel production decreased by 12 % in 2019. Comparing 2017 and 2019, crude steel production decreased by 13 % [9]. The dynamics of changes in steel production in the individual months of 2018 and 2019 are shown in Figure 8.

Such situation in steel production in 2019 was not good for the steel industry in Poland. Moreover consumption of steel products in 2019, was 13 157 thousand tonnes, a decrease of about 12 % compared to the previous year (Figure 9) [9].

By analysing the consumption of the particular steel products, in 2019 the consumption of flat products was achieved at 7 124 thousand tonnes – a decrease of 13 % and long products 4 961 thousand tonnes, a decrease of 9 % [9]. The increase in the competitiveness of Polish steel industry can be achieved by:



**Figure 8** Dynamics of steel production in Poland in 2018-2019 (monthly)



**Figure 9** Apparent finished steel products use in Poland in 2018-2019

- limit for steel products in foreign trade,
- lower electricity supply rates (in 2018, the steel industry in Poland consumed 6,8 TWh of energy),
- reducing the cost of waste, e.g. rejection of requirements for a vision storage system for scrap metal/iron (in 2018, the steel industry in Poland processed 6,75 million tonnes of scrap metal),
- recompensing of additional taxes, e.g. carbon border tax.

In 2019, production was stopped in steelworks Czechochowa for 181 days and in steelworks Krakow (ArcelorMittal Poland) (29 Nov. 2019). Arguments against good situation in Polish steel industry in near future are:

- further increase in energy prices (in 2018, 0,19 toe/tonne of steel was consumed, and in 2004, 0,33 toe/tonne, the average energy intensity in Poland in recent years is lower than in EU, where it is 0,29 toe/tonne of steel) [10-11],
- higher and higher the share of imports of steel products in domestic consumption, in recent years more than 73 % is imports, less than 27% domestic supplies in Polish steel market,
- higher costs of energy in Poland than in other neighbouring countries (about 20 % higher),
- high wage costs and level of employment in steel plants,
- high prices for CO<sub>2</sub> emission allowances in EU,
- uncertainty regarding the economic situation in the Polish and European steel markets (going on debate about neutral economy for climate and the problem of CO<sub>2</sub> in the steel production,
- new investments in clearer climate (technology – CCU, CCS),
- the world's and European overproduction of steel, in Poland,
- underutilization of production capacity in recent years in Polish steel industry (e.g. 79 % of steel production capacity was used in 2018, in previous years this percentage was lower).

## CONCLUSION

Based on the analysis of situation in Polish steel industry the following conclusions were drawn:

- in long time the steel production in Polish steel sector was 9 112 thousand tonnes (average value on the base of data in Table 1)
- since 2005 consumption is higher than domestic steel production in Poland (Table 2),
- employment in last years is on the level about 24 000 (Figure 6),
- efficiency in steel production is about 400 tonnes of steel per one employee or 600 tonnes per one worker in steel production (Figures 7).

## Acknowledge

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**Note:** The responsible for English language B. Gajdzik, Poland.