

## THE SOCIO-ECONOMIC IMPORTANCE OF STEEL - AN OVERVIEW OF GLOBAL STEEL DEMAND

Oana CHINDRIȘ-VĂSIOIU<sup>3</sup>

Institute for World Economy - Romanian Academy

**ABSTRACT:** *Steel is one of the most used metals in modern society. Versatility, durability and resistance make it a popular choice for many different applications: metal constructions/confections, pipes for the transport of hot/cold drinking water, parts and parts for machinery, power line poles, auto production, advertising industry, household appliances. Steel is an alloy of iron and carbon containing less than 2% carbon, 1% manganese and insignificant amounts of silicon, phosphorus, sulfur and oxygen. There are more than 3500 grades of steel with different physical and chemical properties. British inventor Henry Bessemer is credited with developing the first mass production technique for steel in the mid-1850s. Steel is still produced using technology based on the Bessemer Process of blowing air through molten iron to oxidize the material and separate impurities. Considering the many fields in which steel is used and the impact of its use on the world economy, in this paper I considered it important to analyze the demand and consumption of steel at the world level. Thus, I focused both on the comparative analysis of world regions and on an analysis of the main ten steel consuming countries worldwide. In my study I used data provided by the World Steel Association, an international organization founded in 1976, which represents and promotes the steel industry globally.*

**Keywords:** *steel, demand, consumption, world economy*

**JEL classification:** *L61, N60*

### 1. INTRODUCTION

Steel is the most important material in the world used in many industrial sectors such as: transport, civil construction, renewable energy and household appliances. A globally competitive economy depends on an efficient, modern and integrated transport network. Almost all vehicles on the road today are made of steel. Railway transport requires steel for trains, rails and infrastructure. Shipbuilding traditionally uses structural steel sheets to manufacture ship hulls. Steel is widely used for aircraft landing gear due to its high strength. The innovative use of very high strength steel in the construction of the machines contributes to excellent performance following the impact tests. And the corrosion-resistant metal coating ensures a longer service life. The housing and construction sector is the largest consumer of steel today, where around 50% of the world's steel production is used. It took 57,000 tons of steel to build the skeleton of the Empire State Building, one of the most recognizable buildings in the world. Also, steel is the main material used in the supply of renewable energy - wind,

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<sup>3</sup> Ph.D., Scientific Researcher III, oana.vasioiu@gmail.com

solar and water. In the renewable energy sector, steel products with specific mechanical properties are used in hydroelectric plants for turbines, water gates and valves that take water to the turbines. In the case of wind energy, high-strength steel plates and long profiles are used to make the structure of the towers, and electric steel for generators. Finally, a specific range of flat steel products is used for household appliances, so that the technical performance is optimized. The versatility and resistance of steel make it the perfect material for household appliances. Specific grades of flat steel products are used in a wide range of appliances, including ovens and refrigerators. In addition, for decades the steel industry has been reducing the need to use raw material and encouraging steel recycling. This material is the most recycled on the planet. [3]

The World Steel Association (WSA) is one of the most important organizations in the steel industry, bringing together 180 manufacturers, national and regional associations, and research institutes. Members of the organization produce approximately 85% of the steel delivered worldwide each year. The main purpose of the organization is to promote sustainable development and address the common problems of the steel industry. This includes issues such as climate change, technological innovation, occupational safety and health, international trade and energy efficiency. WSA provides relevant statistics and data on global steel production, consumption and trade. This information is used by the members of the organization, but also by other actors in the industry and economy to understand and determine the evolution and trends in the field of steel. WSA also plays an important role in promoting collaboration between companies to facilitate the exchange of best practices and knowledge in the steel industry. It was founded as the International Iron and Steel Institute on 10 July 1967. In the beginning, there were 18 founding members from seven European countries and from Australia, Canada, Japan and the US. It changed its name to the World Steel Association on 6 October 2008. [4]

## 2. WORLD STEEL DEMAND

According to the World Steel Association, global steel demand will increase to 1,822.3 million tons, or 2.3%, in 2023, and to 1,854 million tons, or 1.7%, in 2024. WSA representatives pointed out that in 2022, the recovery of the steel market after the pandemic shock was affected by high inflation and rising interest rates, the Russian invasion of Ukraine and the quarantine imposed in China. As a result, activity in steel-using sectors fell in the last quarter of 2022. This, combined with the effect of inventory adjustments, led to a larger-than-expected contraction in steel demand.

**Table no. 1. Global steel demand by region, 2022-2024 ( million tons)**

	<b>2022</b>	<b>2023 (f)</b>	<b>2024 (f)</b>
European Union (27) + Great Britain	151,8	151,3	159,8
Europe - other countries <sup>1</sup>	39,2	42,1	44,6
Russia and other CIS countries <sup>2</sup> + Ukraine	53,3	51,5	49,3
USA + Mexico + Canada	132,9	135,0	138,1
Central and South America	45,4	46,0	47,0
Africa	40,6	40,5	42,1
Middle East	51,3	52,4	54,1
Asia and Oceania	1267,0	1303,6	1319,1
<b>Total – 63 countries</b>	<b>1781,5</b>	<b>1822,3</b>	<b>1854,0</b>

Notes: <sup>1</sup> Macedonia, Norway, Serbia, Turkey; <sup>2</sup> Belarus, Kazakhstan.

Source: The World Steel Association (April 2023), *Steel Demand Forecast*, <https://worldsteel.org/steel-topics/statistics/short-range-outlook/>

Persistent inflation and high interest rates in most economies will limit the recovery in steel demand in 2023, despite positive factors such as the reopening of China's economy, Europe's resilience in the face of the energy crisis and the easing of supply chain bottlenecks.

In 2024, global steel demand will increase due to regions outside of China, but at the same time will face a global slowdown due to the forecast stagnation of China's economy. At the same time, sustained inflation will further affect global steel demand. [5]

In the European Union (EU), 2022 ended with a sharper-than-expected decline in steel consumption (-7.2%) as steel demand decreased significantly due to the energy crisis and the impact of the war in Ukraine. It is estimated that the ban on steel imports from Russia will affect products worth 3.3 billion euros. Europe's refusal to buy Russian rolled steel forces Russian factories to redirect the supply to China and Asia. But it is unlikely that this move will provide material economic benefits.

Steel consumption is still forecast to be negative (-1%) in 2023, before recovering in 2024 (+5.4%). Specialists from the European Steel Association are of the opinion that the steel industry has been severely affected at the end of 2022, struggling to recover, but the conditions are not yet favorable. Decarbonization projects are underway, but the EU needs access to green and affordable electricity for a sustainable transition of the steel sector. [2]

The most important steel consumer in the EU is Germany, with a consumption of 31.6 million tons in 2022, which represents more than 20% of the total steel consumption of the EU countries and the UK. (Table no. 2)

**Table no. 2. Major consumers of steel worldwide, 2022-2024, (million tons)**

	2022	2023 (f)	2024 (f)
1. China	920.9	939.3	939.3
2. India	114.9	123.3	130.9
3. United States	94.5	95.8	98.2
4. Japan	55.0	57.2	57.9
5. South Korea	51.2	52.7	53.8
6. Russia	41.7	39.6	36.9
7. Turkey	32.5	35.4	37.6
8. Germany	31.6	30.9	34.0
9. Italy	25.1	24.9	25.8
10. Mexico	24.8	25.4	26.1

Source: The World Steel Association (April 2023), *Top 10 Steel Using Countries*, <https://worldsteel.org/steel-topics/statistics/short-range-outlook/>

*China's* steel demand contracted in 2021 and 2022 as its economy decelerated sharply due to unexpected nationwide shutdowns caused by the Covid19 pandemic. The construction sector suffered the most in 2021 and 2022. WSA experts believe it will recover moderately in 2023, and China's total steel demand is expected to grow by 2% in 2023 and remain flat in 2024.

As for *India*, the WSA experts opined that after managing inflation well, the economy is set to see healthy growth with an increase in investment in GDP due to strong government spending on infrastructure. At the same time, the residential sector is expected to grow, supported by affordable housing projects as well as increasing urban demand. India's capital goods sector will benefit from the boost from infrastructure and renewable energy investments. Motor vehicles and consumer goods are expected to maintain healthy growth driven by sustained growth in private consumption. After growing by 8.2% in 2022, steel demand in India will grow by 7.3% in 2023 and 6.2% in 2024, WSA estimated.

In the *US*, forecast steel growth in 2023-2024 is expected to be subdued under recessionary pressure, WSA analysis shows. Rising car prices, high gas prices and rising interest rates have caused US car sales to decline in 2022. Analysts expect a recovery of 8.0% in 2023 and another 7.0% in 2024, considering a potential decline in interest rates. However, car sales will reach only 94% of the level recorded in 2019. Infrastructure development is supported by recent legislation such as the Infrastructure Act 2021 and the Inflation Reduction Act (IRA). Demand for steel from the power sector will benefit from expanding power production. However, US steel demand is expected to grow by only 1.3% in 2023 and 2.5% in 2024. [7]

*Japan's* steel demand contracted in 2022 due to low production levels and reduced inventories. The construction sector will expand in 2023 and 2024 mainly due to civil engineering projects supported by the National Resilience Master Plan. [1] However, labor shortages continue to constrain construction activities. In manufacturing, the industrial machinery and automotive sectors will see growth in 2023 and 2024. Therefore, in Japan, steel demand is forecast to grow by 4.0% in 2023 and 1.2% in 2024.

In 2022, *South Korea* steel demand contracted significantly due to lower plant investment and activity in the construction sector, which was further affected by damage caused by repeated floods in the Pohang region. Although auto production rebounded in 2022 due to easing supply chain constraints and strong exports, moderate growth is expected in 2023 and 2024. However, WSA analysts forecast that car production will remain below pre-pandemic levels, but the shipbuilding sector will contribute to a slight recovery in demand in 2023 and 2024. South Korea will have a steel demand grow by 2, 9% this year and 2% next year.

*Russia's* economy avoided a full-scale crisis in 2022, and steel demand contracted less than expected. In 2022, it was supported by pipeline projects and residential construction. However, the demand for steel is reduced because 8 of the 14 Russian auto factories have suspended their activities, and the decline of the auto industry could be 50%. In 2023-2024, the construction sector is expected to slow, and Russian steel demand will have an accelerated contraction in 2024. In the next years, the Russian economy will face major challenges due to Western sanctions as well as labor losses caused by the war. Thus, steel demand in Russia is forecast to decrease by a further 5.1% in 2023 and by 6.8% in 2024. [7]

### 3. CONCLUSIONS

Steel is closely related to the way the world has developed and the way our everyday life has changed. In 1950, in the world, there were only 11 buildings taller than 200 m. Today there are 935 buildings taller than 200 m, worldwide. In the same year (1950), 10 million cars were produced worldwide, their number reaching 80 million today.

Steel is important to the world, being necessary for building a solid future. Affected by crises, the steel market will have to adapt and find new solutions to withstand. Global crises lead not only to a decrease in demand for steel, but also to a decrease in its production. Many of the steel producers are forced to adapt to the market and produce only those materials for which there is demand or lower the price of the others. A surplus of products will be reached, which will mean a drop in prices and maximum competitiveness in the market. Thus, it will be necessary to identify new markets and diversify the products offered, as well as cheaper solutions for steel production. The implementation of technologies that lower production costs and increase the quality of the resulting products is one of the solutions to overcome the crisis. The evolution of the steel market for 2023 remains subject to a high level of uncertainty, which will probably continue to undermine demand in the sectors that use steel. Given the current

context, against the background of a worsening energy crisis and the shortage of raw materials, we cannot exclude a new recession or a stagflation scenario.

The outlook for 2023 remains negative, paving the way for the fourth downturn in steel demand in the last five years. A modest recovery is emerging in 2024, albeit subject to high uncertainty caused by energy price developments, Russia's war in Ukraine and their impact on inflation and global supply chains.

Steel manufacturing is expected to lead the recovery, but high interest rates will continue to weigh on steel demand. Recycled-content steel could benefit from another trend identified by the group. Investments in decarbonization and dynamic emerging economies will increasingly drive positive momentum for global steel demand, even as China's contribution to global growth diminishes.

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