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**The European
Foundry Association**

2023

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Preface

The CAEF - European Foundry Association - Commission for Economics & Statistics is pleased to present the latest edition of its statistical annual, The European Foundry Industry 2023. Compiled meticulously from national reports and statistical data provided by CAEF member countries, this report delivers an insightful, data-driven overview of Europe's foundry industry. To enhance its scope, data from European foundry nations outside of CAEF membership have also been included wherever available, contributing to a broader and more inclusive statistical representation.

This annual publication underscores CAEF's commitment to transparency and knowledge-sharing, providing decision-makers, industry stakeholders, and policymakers with vital data to better understand trends, challenges, and opportunities within the European foundry sector. Although certain data categories—particularly production values—remain incomplete due to reporting limitations, the report stands as the most comprehensive and reliable resource available on the industry.

Looking ahead, we are excited to announce that next year's data book will be published under our new name, the European Foundry Federation (EFF), featuring a refreshed logo and updated graphic design that reflect the evolution of our organization and its commitment to the future of European foundries.

Our deep appreciation goes to the CAEF member association representatives whose diligent efforts and collaboration were instrumental in bringing together this rich body of information. This publication would not have been possible without their contributions, underscoring the collective strength and dedication of the European foundry community.

Düsseldorf, November 2024

CAEF - The European Foundry Association



Chiara Danieli

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Commission for economics & statistics, Secretary

TOTAL SURVEY



The European Foundry Industry in 2023

The Economy and the Casting Customer Industries

The Macro-economic Situation at the end of the year 2023

In 2023, Europe faced a challenging macroeconomic environment as economic growth slowed amidst various pressures. The energy and inflation crises eased somewhat compared to 2022, with inflation rates gradually declining across the EU, yet remained elevated enough to strain household spending and industrial costs. Inflation dropped to around 3% in the euro area, but the impact of previous rate hikes by the European Central Bank (ECB) continued to weigh on consumer and business borrowing. The ECB maintained high-interest rates through the year to stabilize inflation, leading to cautious spending patterns and restrained investments.

The EU economy grew moderately by around 0.8% in 2023, mainly due to weaker global demand and slowdowns in major trading partners like China. External factors, including currency fluctuations and increased competition, affected European exports, especially in sectors dependent on global markets. Although there was some relief from lower energy prices, inflation remained above target and high interest rates constrained consumer and business spending. This environment fostered uncertainty, leading to subdued economic growth and lower-than-expected demand across a range of industries. The European labour market showed resilience, with relatively stable employment levels; however, the ongoing high cost of living led to cautious consumer spending, particularly on non-essential goods and services. Government measures aimed at alleviating energy costs, alongside EU-wide investments in green technology, have provided some support for the industrial sector, including casting industries. Yet, challenges in demand from key sectors like automotive and construction limited recovery. Automotive production, a significant consumer of cast products, faced slower growth, and the construction sector's recovery was constrained by both high materials costs and uncertain economic prospects.

The ongoing war in Ukraine and the recent Israel-Gaza conflict have deepened uncertainty across the European economic landscape. The Russia-Ukraine war continues to strain energy supplies and commodities, causing volatile prices and impacting production costs, especially in energy-dependent industries. Meanwhile, renewed tensions in the Middle East are raising concerns over oil prices and trade route security, adding to the cautious outlook of businesses. Together, these conflicts complicate Europe's path to economic stability, as companies remain wary of investing amid the potential for escalated geopolitical tensions and supply chain disruptions.

The macroeconomic landscape of 2023 has shown resilience but remains fraught with challenges. While inflation has eased, high interest rates continue to dampen spending and investment. Industrial recovery is slow, particularly in sectors like automotive and construction, while global demand has softened, impacting exports. Additionally, ongoing geopolitical conflicts have heightened uncertainty, pressuring businesses to proceed cautiously. Together, these factors indicate that while some stability has been achieved, the European economy faces a prolonged path to robust growth.

Table 1: Forecast 2023/2024

Country	Weighting In %		Gross Domestic Product Growth Rate in %			Consumer Prices Growth Rate in %			Unemployment Rate In %		
	Population	GDP	2023	2024	2025	2023	2024	2025	2023	2024	2025
Austria	1,6	2,4	- 0,7	0,4	1,6	7,7	3,9	2,8	5,1	5,4	5,2
Belgium	2,0	2,9	1,5	1,2	1,2	2,3	3,6	2,0	5,5	5,5	5,5
Bulgaria	1,2	0,5	1,8	2,7	2,9	8,6	3,4	2,7	4,4	4,3	4,2
Croatia	0,7	0,4	2,8	3,0	2,7	8,4	3,7	2,2	6,2	5,8	5,5
Czech Republic	1,9	1,5	-0,4	0,7	2,0	10,7	2,1	2,0	2,6	2,6	2,5
Denmark	1,0	1,9	1,8	2,1	1,5	3,4	1,5	2,0	4,9	4,9	4,9
Finland	1,0	1,4	-1,0	0,4	1,9	4,3	1,2	1,9	7,2	7,6	7,4
France	11,6	13,4	0,9	0,7	1,4	5,7	2,4	1,8	7,4	7,4	7,0
Germany	14,8	19,7	-0,3	0,2	1,3	6,0	2,4	2,0	3,0	3,3	3,1
Hungary	1,7	0,9	-0,9	2,2	3,3	17,1	3,7	3,5	4,1	4,4	4,2
Italy	10,4	9,9	0,9	0,7	0,7	5,9	1,7	2,0	7,7	7,8	8,0
Lithuania	0,5	0,4	-0,3	2,2	2,5	8,7	1,5	2,3	6,6	6,3	6,1
Netherlands	3,1	4,9	0,1	0,6	1,3	4,1	2,7	2,1	3,6	3,9	4,2
Norway	1,0	2,5	0,5	1,5	1,9	5,5	3,3	2,6	3,6	3,8	3,8
Poland	6,6	3,4	0,2	3,1	3,5	11,4	5,0	5,0	2,8	2,9	3,0
Portugal	1,8	1,2	2,3	1,7	2,1	5,3	2,2	2,0	6,6	6,5	6,3
Slovenia	0,4	0,3	1,6	2,0	2,5	7,4	2,7	2,0	3,7	3,7	3,8
Spain	8,4	6,8	2,5	1,9	2,1	3,4	2,7	2,1	12,1	11,6	11,3
Sweden	1,9	2,7	-0,2	0,2	2,2	5,9	2,6	2,0	7,7	8,4	8,2
Switzerland	1,5	4,0	0,8	1,3	1,4	2,1	1,5	1,2	2,0	2,3	2,4
Türkiye	15,0	4,7	4,5	3,1	3,2	53,9	59,5	38,4	9,4	9,6	9,6
UK	12,0	14,4	0,1	0,5	1,5	7,3	2,5	2,0	4,0	4,2	4,1
CAEF ¹	100	100	1,4	1,6	2,0	10,6	8,5	6,0	5,9	6,0	5,8

Source: International Monetary Fund, World Economic Outlook Database, April 2024

The Economic Situation in the Major Casting Customer Industries

Vehicle construction

In Europe (EU, EFTA & UK), the market recovery continues, with solid production growth further supporting the increase in new registrations. The European passenger car market developed positively, registering a 14% increase compared to 2022, resulting in 12.8 million new passenger car registrations.

In the United States, the light vehicle market (passenger cars and light trucks) closed the same period with around 15.4 million vehicles sold, marking an improvement of 12% over 2022. In Brazil, the light vehicle market recorded a gain of 9% over the same period, reaching 2.1 million units.

China achieved another strong year, recording 25.8 million units and showing an 11% growth. The Japanese new car market rose by 16% year-on-year, with 4.0 million passenger cars sold. Meanwhile,

¹ Gross Domestic Product and Consumer Prices weighted by GDP share of CAEF countries. Unemployment Rate weighted by population share of CAEF countries.

the Indian passenger car market showed significant recovery, with new registrations for the full year up by 6% from the previous year (4.0 million units).

In the full year of 2023, the German passenger car market grew by 7% in new car registrations. Positive developments were also seen across major individual European markets, with the United Kingdom achieving a 17% increase, France seeing a 16% rise, and Italy showing a 20% boost.

The global passenger car market therefore rose to 79.5 million units in 2023, reflecting a 10% increase. For 2024, a slight growth of under 1%, to 79.9 million vehicles, is expected.

In 2023, international markets for heavy commercial vehicles over 6 tonnes showed predominantly growth, with most markets recording an increase in sales figures. China, the world's largest market for heavy commercial vehicles, saw a remarkable sales increase of approximately 30% (preliminary estimate) compared to the previous year. Western Europe also experienced strong growth, with sales up by 18%, while the U.S. market recorded a 7% increase. Brazil, however, was an exception, with sales declining by 18%.

Mechanical engineering

In 2023, the European mechanical engineering sector faced substantial hurdles, primarily due to decreased order intake, increased borrowing costs, and fluctuating energy prices, which strained growth prospects across much of Europe. Many companies observed declining demand, particularly from the construction and automotive sectors, leading to an overall downturn. Production was estimated to fall by approximately 1% across the continent, especially affected by weakened orders from mid-2022 and reduced investment in machinery and equipment as companies braced for economic uncertainties.

Nonetheless, some specific sub-sectors managed resilience, particularly those involved in producing measuring instruments, valves, and signalling devices. Exports of these products showed growth despite broader declines in areas like pumps and compressors, and boilers and turbines. Sectors linked to energy efficiency and control apparatus also saw relative stability, as demand for high-tech equipment and automation remained notable amid Europe's ongoing digital transformation and green transition.

Germany, as the largest contributor to Europe's mechanical engineering output, saw moderate contractions driven by high operational costs and softer global demand, which echoed across several other EU nations. Even with the hurdles faced, Europe's competitiveness in global markets was supported by companies pivoting towards high-value and innovative products, which helped sustain the sector's global standing, particularly against competition from regions like the United States and Asia.

Building industry

In the European construction sector in 2023, despite high construction costs and skilled labour shortages, significant constraints came from the rising interest rates, which particularly impacted the housing market by deterring investments in new residential projects. The sector's contraction was modest but pervasive across the EU, with a predicted decrease of around 0.5% overall. Positive momentum, however, was visible in the renovation and maintenance (R&M) segment, which increased due to high demand for energy-efficient refurbishments, driven by incentives like the EU's Energy Performance of Buildings Directive. This push has encouraged work in energy renovations, such as insulation and solar installations, especially with high energy costs and sustainability goals on the rise. Country-specific issues also highlighted regional challenges and resilience within the sector. In Germany, the construction market showed contraction for a third consecutive year, with ongoing material and labour shortages affecting timelines and budgets. On the other hand, Spain saw continued declines, marking its fifth consecutive year of reduced construction volumes. The general trend in Europe has been towards stabilisation rather than expansion, with a backlog of projects for some contractors, though ongoing financial and material constraints are likely to slow the pace into 2024.

Steel industry

The World Steel Association, Worldsteel, reported a global crude steel production volume of 1,850 million tonnes for the year 2023. This represents a slight decrease of 0.1% compared to the previous year.

In the European Union, steel producers recorded a decline, producing 126.3 million tonnes of crude steel, down by 7.4%. Of this, Germany accounted for nearly 35.4 million tonnes, marking a 3.9% decrease. During the same period, crude steel production in Asia rose by 0.7% to 1,367 million tonnes compared to 2022. China alone produced approximately 55% of the world's steel, making it the largest single contributor to global production.

North American crude steel producers, however, could not maintain the previous year's volume, producing 109.6 million tonnes—a reduction of 1.7%. In contrast, U.S. production within the region grew slightly by 0.2%, reaching 80.7 million tonnes. In the CIS countries, crude steel production in 2023 was estimated at approximately 88.1 million tonnes, a solid increase of 4.5% from the previous year.

As of the first seven months of 2024, global steel production totals 1.107 billion tonnes, reflecting a decrease of about 0.7% from the same period in the previous year. During this time, Europe showed a modest 1.5% production increase, while Asia experienced a 1.2% decline, and North America reported a larger decrease of 3.8%.

The Foundry Industry

In 2023, the iron and steel foundries of CAEF member countries produced 10.5 m. tons of castings. Compared to previous year, this number corresponds to a 2.0% decrease in production. The five countries dominating in terms of castings tonnage, namely Germany, Türkiye, France, Spain and Italy, account for 82 % of the ferrous metal castings production. The production increased only in four countries compared to the previous year. Portugal (5,8%), the United Kingdom (2,3%) and Spain (2,3%) had the biggest increase compared to the previous year. Meanwhile the production in Finland was -12% and in the Czech Republic -19.1% lower than in 2022.

In 2023, non-ferrous metal foundries within CAEF booked a production increase of 2.8% to 3.9 m. tons. The three countries that dominate the production of non-ferrous metal castings, namely Italy, Germany and Türkiye, account for 62% of the total volume of non-ferrous metal castings produced in the CAEF member states. In both Germany and Spain production increased at an above-average rate (3.0% and 3,7%) compared to the other CAEF countries.

The number of persons employed in iron and steel foundries increased only in Spain, Switzerland and Turkey, all three for the second consecutive year. Overall, however, employment in foundries in CAEF member countries stagnated at 123 400 persons. In 2023 the non-ferrous metal sector was dominated by negative employment trends. In the End of 2023 approx. 110,000 people worked directly in European foundries. Compared to 2022 the number of employees decreased by 2.9%.

The share of cast iron with lamellar graphite in the output total of iron and steel castings was 48.6%, a slightly higher share than in the year before. Correspondingly, the share of ductile cast iron logged (44.4%). The share of steel casting sector was slightly higher (7.0%).

The production of castings made of non-ferrous metal alloys is still dominated by light metals. The share was 86.2%. Furthermore, the share of copper alloys holds the level of round about 5.9%. Therefore, the share of components made of zinc alloys was 7.9%.

The Situation in the Casting Material Sectors

Iron

At 5.1 m. tons, the output of the CAEF member states was down by -0.6%. After the decrease in 2022 (-2.8%) driven by economic downswing in Europe, this trend persists. Austria, Czech Republic, Finland, Switzerland and Slovenia all had negative growth double digits in 2023. Germany registered an increase of 0.8% in iron castings in 2023. Meanwhile Spain (11.0%) had the highest growth rates of all CAEF members.

Compared to 2019 however the production is still about 9% lower. As ever, the data available for the cast-iron sector is too sketchy to allow determining the overall value of production. The output of components made of cast iron with lamellar graphite is largely destined for the motor vehicle and mechanical engineering industries.

The number of persons employed in iron foundries (incl. ductile cast iron) increased only in Spain (7,3%) and Türkiye (1,4) and was stable in Bulgaria, Hungary, Poland and Slovenia. On the other hand, the number of persons employed in iron foundries decreased in Finland, Germany, Italy and Portugal leading to a 0.8% decline overall.

Ductile Cast Iron

The producers of ductile cast iron reported a decrease of output by 1.5% to 4.7 m. tons.

Croatia, Poland, Portugal, Switzerland and the United Kingdom reported growth, while the rest of the members faced declines.

Cast iron with spheroidal graphite (GLS) traditionally dominates the ductile cast iron sector with an unchanged share of 99% during the last years. Correspondingly, malleable iron as a niche product holds a share of a little bit more than 1%. In this context, it should be noted that malleable casting statistics have lost some of their meaning because in some states it is impossible to break down the figures for the ductile cast-iron sector. Therefore, data for malleable castings are not collected any more since 2016. Nodular iron components are mainly produced in Germany, Turkey, France, Spain, and Italy. As ever, components for the motor vehicle and mechanical engineering industries predominate in the production of ductile castings, with the building industry following in third place among the customer industries. If analysing the shares of motor vehicle castings in those countries for which data are available, one sees that the highest shares are reported from Portugal at 85.1%, Spain at 52.8%, Germany at 45.5% and Türkiye at 41.3%. The mechanical engineering industry holds the highest shares in output in Italy at 56.6% and Germany at 37.7%. Unfortunately, it is impossible to present the share for the building industry.

Steel castings

In 2023 the output of steel castings decreased by 8.0% to 747,300 tons. Türkiye, the leading producer since 2018, logged this year a significant decrease of 7.0% in production volume compared to the year before. For Germany, second in line, the production decreased by 18.2%, after a strong growth in 2022. Together both countries account for 52.5% of CAEF steel casting production.

The number of persons employed in steel foundries increased by 2.5%. In Germany (2,7%), Spain (11,5%), Portugal (7.7%) and Türkiye (2,1%) the number of employees increased, whereas the number of persons employed stayed same in Bulgaria, Hungary and Poland. Meanwhile in Finland, Italy, and Slovenia a reduction was reported. At the end of 2022 nearly 22,700 people were employed in European steel foundries.

Non-ferrous metal castings

The output of non-ferrous metal casting components in the CAEF member countries increased by 2.8% to 3.9 m. tons.

Traditionally, the production of non-ferrous metal castings is dominated by light metals. The motor vehicle industry is the foremost customer. In the year 2023 the output of light metal castings (aluminium and magnesium) increased by 0.5% compared to 2022, reaching nearly 3.4 m. tons. Together Italy, Germany, and Türkiye, the three major producers, account for 62.3% of the light-metal castings. The production for these leading countries went up by 0.3% for Italy. Meanwhile Türkiye noted a small decrease, this year it amounts to decline of 0.8%. Germany had a moderate growth compared to 2022 (3,4%). Among the light metal alloys, magnesium plays a subordinate role in terms of output weight.

The second most important material category in the non-ferrous metal sector is that of copper and its alloys. For countries with registered production for 2023 the level increased by 10.1% after a decrease of 8.2% in 2022. The reported volume in 2023 reached a level of more than 219,00 tons. Germany, Italy, and Türkiye, the three biggest producer countries of copper alloy castings in CAEF accounted together for 63.7% of copper alloy castings production in CAEF in 2023. In 2023 Germany registered strong increase in production (43.1%). The output of zinc castings increased by 0.2% to a volume of 214,100 tons. Italy, Germany, and Türkiye are the major producers, together holding a share of 78.9% in output total.

The statistical data available for the category of 'other non-ferrous metal alloys' are fragmentary. In addition, some countries include copper and zinc in this category, because there is no facility for segregating these. Therefore, it is impossible to analyse this category more extensively.

Sources:

ifo Munich, IMF, ACEA, VDA, VDMA, Euroconstruct, Worldsteel, CAEF

REPORTS OF THE COUNTRIES



Economic Situation 2023 and Outlook 2024

The Austrian economy is in a recession, albeit a relatively mild one in macroeconomic terms. We currently expect GDP to fall by 0.8% in 2023, with goods manufacturing declining by 2.7% in real terms. However, the situation in goods manufacturing in particular is very heterogeneous; metalware manufacturing, for example, is currently experiencing much greater turbulence than other industrial sectors. The economic downturn began in the previous year and intensified considerably in the summer half-year of 2023. Economic output fell again in the third quarter, having already declined significantly in the previous three months. This was partly due to the global weakness in demand, which dampened foreign trade and industrial activity in Austria. On the other hand, the inflation triggered by the energy price shock reduced the purchasing power of private households, causing them to cut back sharply on consumer spending. In addition, the downturn in the construction industry continued.

Will we see a recovery in 2024?

For large parts of the industry, the prospects of an economic recovery are still a long way off. There are currently no signs of the situation improving any time soon. In purely technical terms, many researchers expect demand to pick up in the second half of the year - but this will be due more to a cyclical effect than hard facts.

In the economy as a whole, the situation looks somewhat different. Thanks to the high wage agreements and falling inflation, real incomes will rise sharply in 2024 - which should significantly boost private consumption. However, there are enough headaches related to industry and the construction sector in particular. Here are a few key points of the macroeconomic outlook for 2024:

- The economy is likely to have bottomed out by the end of 2023.
- Rising real incomes will support private consumption in 2024 and 2025.
- By contrast, the industrial recovery will be somewhat delayed and should pick up speed from the second half of the year.
- Austria's economy will only grow by 0.2% in 2024 - however, this forecast could prove to be too optimistic as things stand at present. Downward revisions are possible.
- GDP is expected to increase by 1.8% in 2025.
- Industrial value added will continue to shrink slightly in 2024 due to the delayed recovery and high negative backlogs from the previous year and will not expand strongly again until 2025.
- By contrast, the construction industry is not expected to bottom out until 2024.
- The services sector is characterized by opposing trends, but is expected to grow noticeably overall in both 2024 and 2025.
- Inflation is expected to fall significantly to an annual average of 3.8% in 2024.
- The decline in natural gas prices on the European wholesale market and the extension of the electricity price cap will dampen household energy prices in 2024.

There are enough risks

The already bleak outlook for 2024 is based on the assumption that no external shock will tip the balance. The coronavirus pandemic and the war in Ukraine have shown us in recent years how fragile the economic balance is. The conflict in the Gaza Strip has so far had no immediate impact on the global economy. However, it could escalate if other regional powers such as Iran become involved. Still, the risk of an oil price shock (as in 1973) appears limited, as the USA is now itself a net exporter of crude oil. However, a blockage of important trade routes, such as the Suez Canal, would be conceivable and could lead to renewed supply chain problems. The war in Ukraine also continues to harbour risks. In conjunction with an unusually cold winter, gas supplies in Europe could dwindle rapidly, especially as

natural gas and crude oil are still being imported from Russia. A shortage could trigger new price hikes for natural gas and fuel inflation if, for example, the gas transit agreement between Russia and Ukraine expires without replacement at the end of 2024. China also poses a risk to the global economy, because high corporate and household debt is weighing on the construction industry. China's economic weakness has also recently been reflected in falling prices, which could additionally dampen demand, as was the case in Japan for a long time. In Austria, a prolonged slump in the domestic industry could lead to a reduction in the labour force, causing unemployment to increase faster than before. A rise in unemployment could slow down the economic upturn, which will be largely driven by consumer spending by private households in 2024

Table 1: WIFO Forecast (in %)

	2023	2024	2025
GDP, real terms	-0.8	0.2	1.8
Goods production	-2.7	-1.5	3.3
CPI	7.8	3.8	2.7
Gross Capital Investment	-2.4	-2.0	2.2

Sources: WIFO Economic Forecast 2024/2025, FMTI Economic News 03-2024

PRODUCTION OF CASTINGS						
2023:2022						
	t	t	growth	value in €		growth
	2023	2022	in %	2023	2022	in %
Grey iron castings	31.899	38.594	-17,3			
Nodular iron castings (incl. malleable iron castings)	99.867	104.096	-4,1			
Steel castings	6.412	6.812	-5,9			
Total iron castings	138.178	149.502	-7,6	523.390.662	511.801.652	2,3
Total zinc die-castings and heavy-metal castings	8.153	10.038	-18,8			
Light alloy castings	123.972	131.859	-6,0			
whereof:						
Al die-castings	104.762	106.991	-2,1			
Permanent mould aluminium castings	13.771	17.649	-22,0			
Al sand castings	1.148	1.104	4,0			
Magnesium castings	4.291	6.115	-29,8			
Metal castings	132.125	141.897	-6,9	1.177.503.435	1.150.293.866	2,4
Total	270.303	291.399	-7,2	1.700.894.097	1.662.095.518	2,3

Source: Association of the Austrian Foundry Industry

Situation of the foundry industry

The industry's own survey for 2023 shows losses in production but growth in turnover, with employment falling again compared to 2022. Total production in 2023 amounts to approx. 270,303 t and has fallen by -7.2 % compared to 2022. The industry's total turnover increased by 2.3% compared to 2022 and amounted to around €1.70 billion.

Iron casting obtained a total production of 138,178 t for 2023 and has fallen by -7.6. Turnover increased by 2.3% to around € 523 million.

Ductile cast iron production amounts to 99,867 t, a decrease of -4.1% compared to 2022.

Steel castings also declined to 6,412 t, i.e. -5.9% compared to 2022.

Production of grey cast iron fell by -17.3% compared to 2022, to a volume of 31,899 t.

In non-ferrous castings, production also fell by -6.9% and sales increased by 2.4 %.

Employment situation

In 2023, a total of 6,130 employees (white-collar and blue-collar workers) were employed, a decline of -5.1% compared to 2022.

The number of apprentices who are being trained in the industry's own apprenticeships (foundry technology and metal casters) went down, compared to 2022.

Incoming orders

Unfortunately, the order situation of our companies has also been affected.

Investment plans

Investment plans are very cautious due to major economic burdens and high interest rates, combined with the uncertain economic situation, and most projects have been postponed. The industry is still suffering from capacity utilization problems.

Personnel costs

The collectively agreed increase in wages and salaries amounts to 8.5 %.

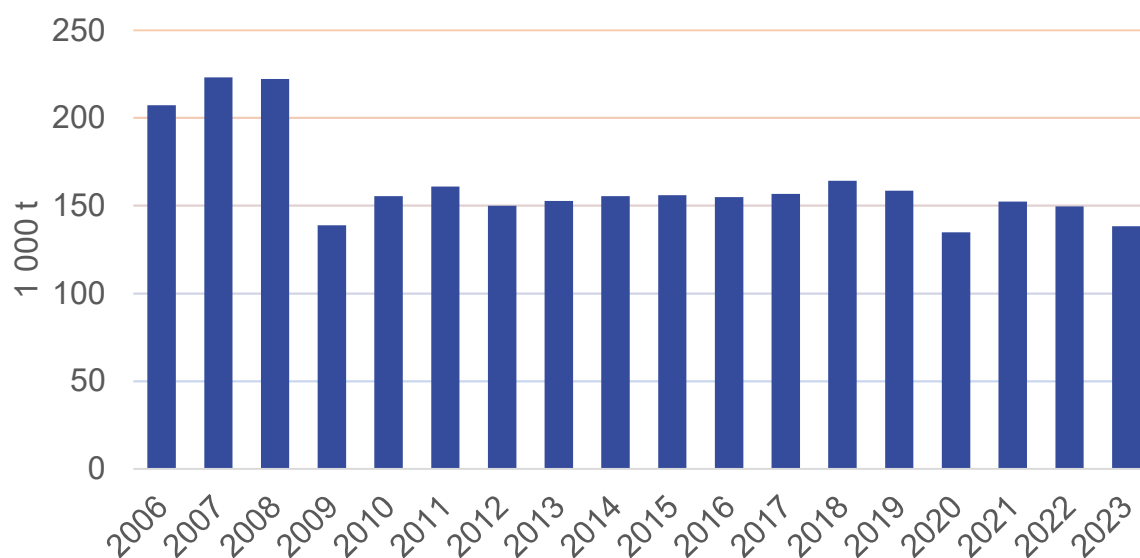
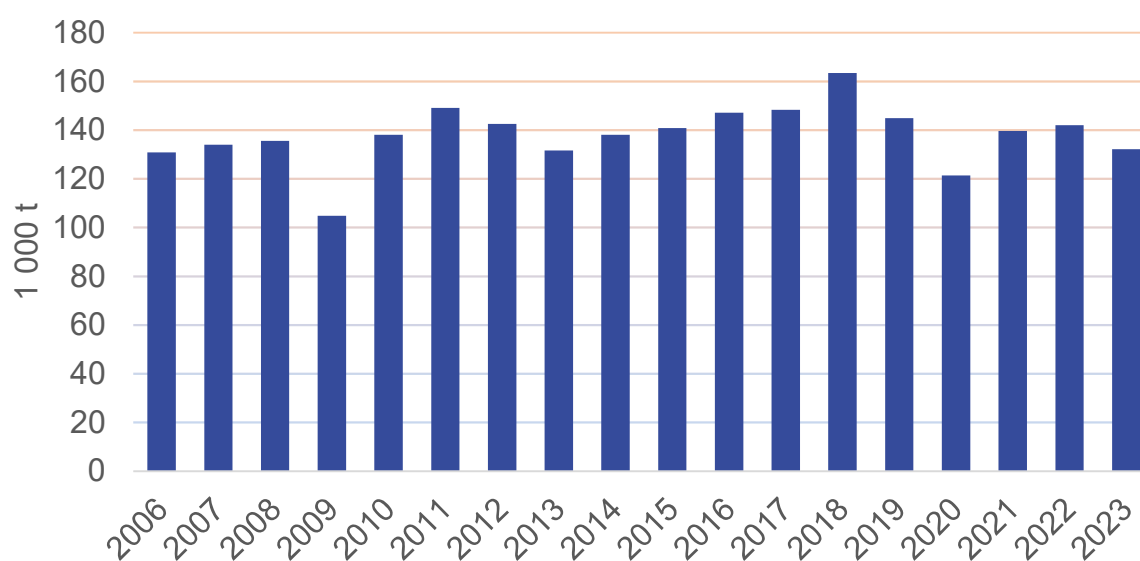
Supply of raw materials and energy

As in the previous year, commodity prices fluctuated in 2023.

Electricity, energy and gas prices in Austria are still at a high level and continue to place a heavy burden on the industry and remain an operational challenge.

Outlook 2024

Unfortunately, this year's situation shows a very mixed and even negative panorama. Most companies register capacity utilization problems. Order backlogs have decreased and are also of an uncertain nature. E-mobility is off to a slow start and mechanical engineering as a whole is in decline. We hope that the situation will now stabilize at a low level and that there will be slight signs of recovery towards the end of the year.

Figure 1: Austrian Ferrous Casting Production (volume)*Figure 2: Austrian Non-Ferrous Casting Production (volume)*



The state of the metal processing industry in Croatia in 2023

In 2023, the Croatian metal processing industry continued to grow, although at a slower pace compared to the previous two years. Revenue growth was aligned with the medium-term average, following exceptionally high growth rates of over 20% in 2021 and 2022. The portion of revenue generated from foreign markets increased, but the growth rate slowed significantly compared to the previous years, resulting in a decreased share of export revenue in the total revenue.

Operational efficiency remained stable, with the EBITDA margin increasing by only half a percentage point, staying at the five-year average. Labor cost pressures intensified, and the average gross salary saw the sharpest increase in the medium-term period, significantly exceeding the average.

Trends in sustainability and digital transformation continued to impact the industry, aligning with the broader EU industrial strategy. Industry resilience and competitiveness are being bolstered through initiatives supporting green and digital transitions, including innovations and new technologies aimed at improving efficiency and reducing environmental impact.

Nearshoring, or relocating production closer to the country of origin, helped establish more resilient supply chains. The European Green Deal and the new industrial strategy played key roles in the regulatory framework, aiming to reduce the environmental footprint while enhancing competitiveness through sustainable practices in various sectors, including automotive and industrial applications.

One of the main challenges for the domestic industry is its dependence on critical raw materials and low-cost semi-finished products, most of which are imported from Asia. This dependence presents an opportunity for investments aligned with the EU's circular economy goals. Additionally, the shrinking pool of skilled labour due to emigration and an inadequate education system that lacks specialized programs tailored to industry needs poses another significant challenge.

Situation of the foundry industry in 2023

In 2023, the Croatian foundry industry, comprising 43 registered companies (4 large, 5 medium, 11 small, and 23 micro-sized), faced a range of challenges and opportunities in line with global and European trends. Historically reliant on the automotive, construction, and mechanical engineering sectors, the industry continued to adapt to changes in the macroeconomic environment.

Macroeconomic Impacts

The year 2023 brought ongoing economic pressures from previous years, especially due to inflation and high energy costs, which remained key factors. Rising electricity and gas prices, along with persistent supply chain disruptions for raw materials, continued to heavily impact production costs in foundries across Croatia. The average EBITDA margin dropped by 1,2%, landing at 12,2%.

Employment

In 2023, the industry employed a total of 3.418 workers, which represents a 1,4% decrease compared to 2022. At the same time, the average gross monthly salary increased by 8,6% year-on-year to EUR 1.371. The labour market in the foundry industry remained under pressure due to a shortage of skilled workers. Many foundries addressed this by seeking professionals from abroad or investing in training programs to close the skills gap.

Innovation and Environmental Standards

Despite these challenges, Croatian foundries continued to invest in technological modernization to improve efficiency and comply with strict European environmental standards. Investments in green technologies and energy-saving processes remained a priority to achieve sustainability and maintain competitiveness within the European market. In 2023, gross investments in new fixed assets surged by 58,1%, totalling EUR 17,6 million.

Exports and Market Trends

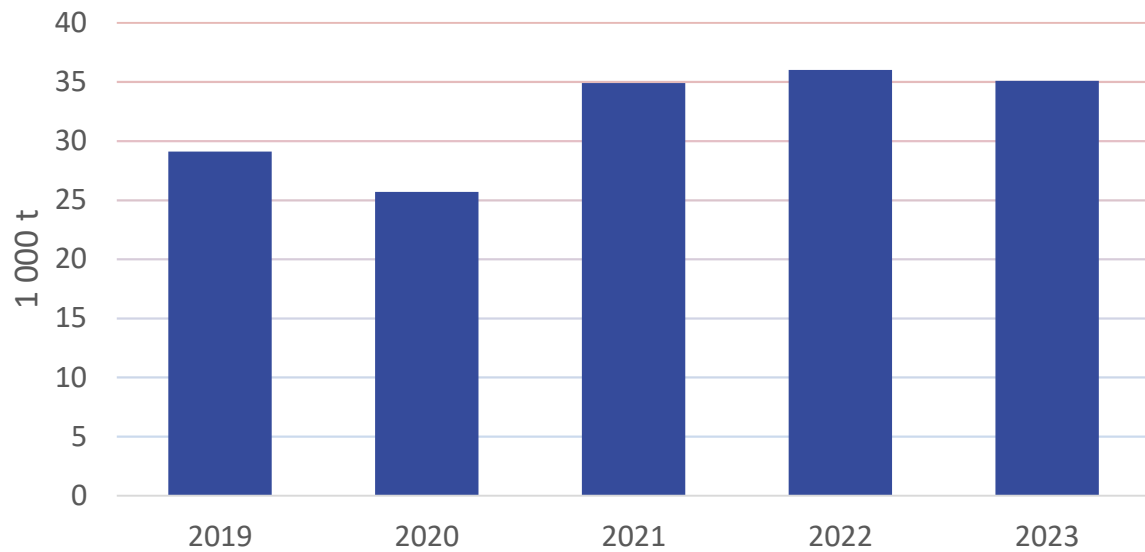
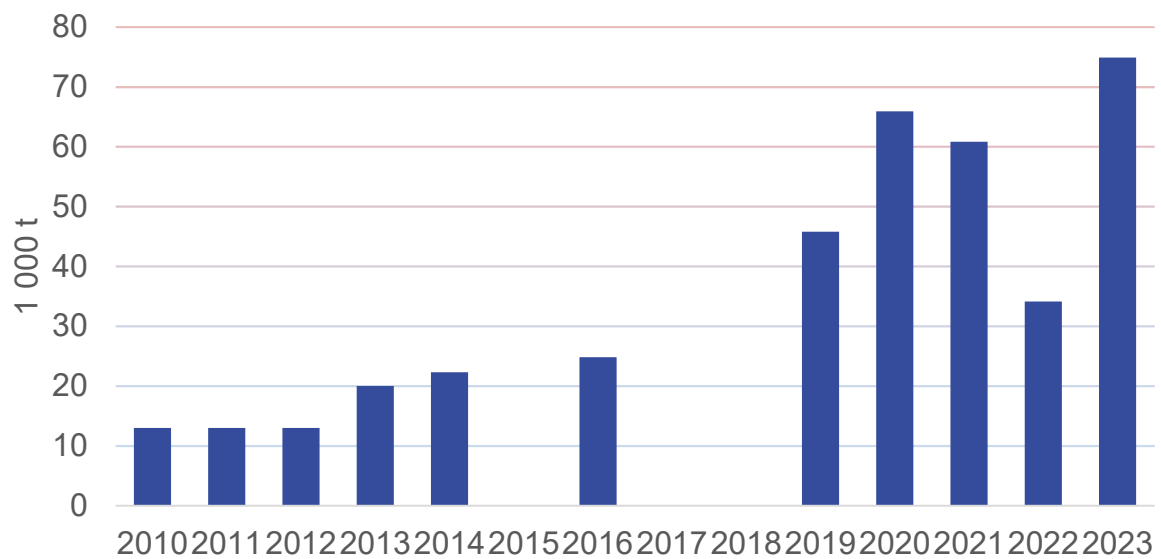
The Croatian foundry industry maintained its strong export orientation, especially toward European Union countries. However, export revenue saw a significant decline in 2023, falling by 4,7% to EUR 238,7 million. Export income accounted for 82,4% of the industry's total revenue, illustrating the heavy reliance on foreign markets. Competition from other European countries and regions such as Asia continued to pose a challenge for Croatian manufacturers.

Conclusion

The year 2023 was a challenging yet potentially transformative period for the Croatian foundry industry. Despite macroeconomic pressures, the industry is adapting and modernizing to remain competitive on the global stage. In the long term, key factors for survival and growth will include further investments in innovation, green technologies, and workforce development.

Sources:

Croatian Chamber of Economy, Metal Industry Association
Croatian Foundry Association

Figure 1: Croatian Ferrous Casting Production (volume)*Figure 2: Croatian Non-Ferrous Casting Production (volume)*



Foundry production hit a historic low last year

The foundry industry in the Czech Republic experienced a recession in 2023 caused by a slump in order content. Inflation had a strong impact on the uncompetitiveness of our foundries. Last year was not easy at all for the foundry industry and in terms of performance it again recorded a decline of 15% in volume terms. Foundries increased prices, but not all customers accepted them. Gradually, the order content decreased. Thanks to the increase in selling prices, the turnover of most foundries remained at the level of the previous year despite the decrease in production. However, the profitability of foundries has declined compared to 2022. If there are no profits, it is difficult to meet obligations, which is the case of foundries, where the owners decided last year to stop production or sell the company.

Now let's take a look at how individual branches of foundry production performed last year. The total production of Czech foundries was 278,000 tons. The worst situation occurred in the last months of the past year, which foundries dealt with by shortening the working week to three production days or by weekly shutdowns. In December, many of them ceased production in the second week. This year, they didn't start again until the tenth day, which is a month-long shutdown! It is difficult to make up for this deficit by raising prices. Other foundries in Europe are also struggling with this situation in general, but governments are helping here by introducing "Kurzarbeit" or reducing fees for renewables. It is surprising why nothing like this is happening in the Czech Republic?

The foundry production of iron-based castings decreased to less than two hundred thousand tonnes last year. This is the second time in the history of the Czech foundry industry. The lack of orders in Europe was reflected in a decrease in the number of small-batch and piece orders heading to the Czech Republic. The piece production of heavy castings, which remained abroad and stopped being ordered from us, was significantly reduced. Orders of the low weight category were sent to the Czech Republic. Czech engineering, which is a major customer of castings, also stagnated. The production composition of castings in Czech foundries prevented the growth of labour productivity, which is the only way to reduce prices and, as a result, to reduce inflation. The substitution of raw material sources brought about a new phenomenon in the form of chemically diverse and often different inputs, which easily fluctuated the stable quality of production.

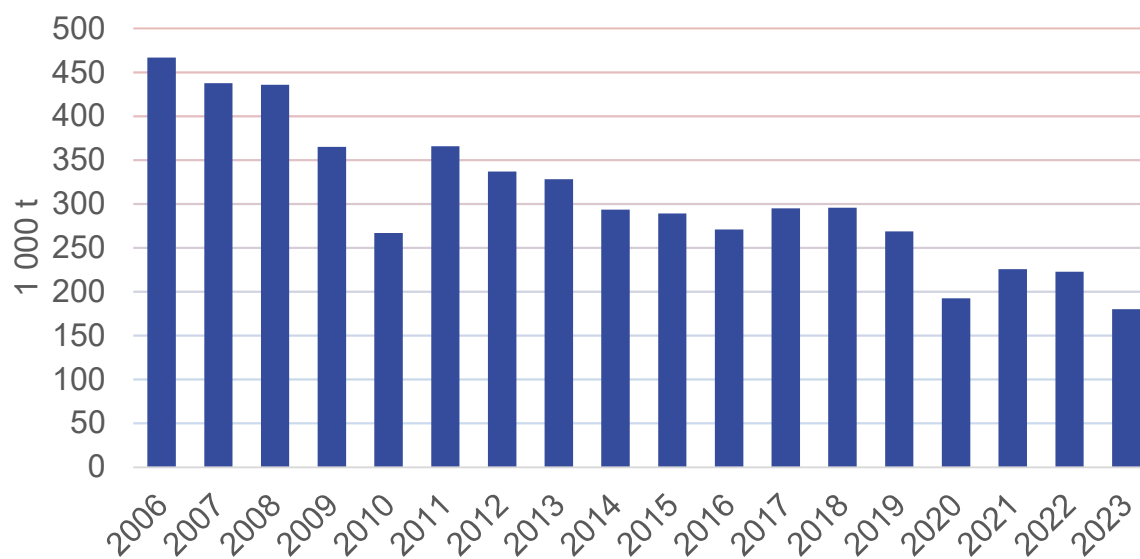
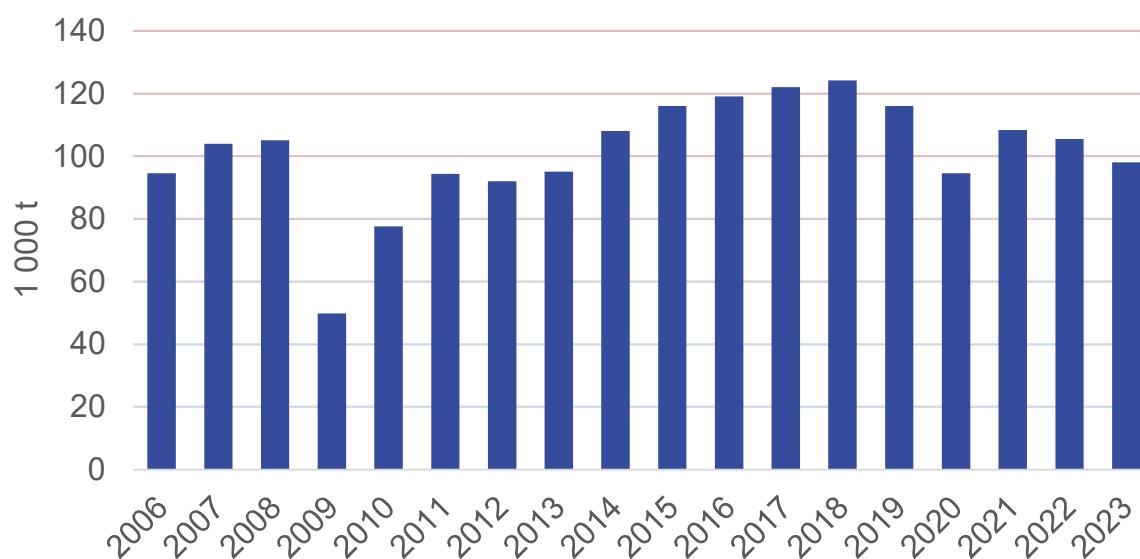
The production of steel castings is directed towards alloyed materials. However, the price of alloys for steel is skyrocketing and designers are looking for other solutions. Carbon steel is gradually being replaced by spheroidal graphite cast iron. For the last four years, steel production has been around 40 thousand tons per year. A huge and fundamental impact on the production of steel castings was the termination of the production of the largest giants Vítkovice Heavy Machinery and Pilsen Steel. Heavy castings were obtained by competitors from England and Germany. It was all the worse for us because the castings from these foundries were linked to direct domestic engineering production. Another effect of the decline is the focus of engineering products on Russia, with which trade has ceased. Steel foundries are heading to Western markets, where it is not easy to succeed in terms of price.

The future of castings lies in light metals. Aluminum alloys are dominant for the automotive industry and are the workhorse of pressure foundries. The gradual shift to electric mobility is leading to further challenges for the foundry. The demand of automotive manufacturers for structural castings is increasing, but they are very risky in terms of return on investment and the uncertainty of market fluctuations. Automotive manufacturing around the world is increasing the use of magnesium in

construction in an effort to continuously reduce the weight of vehicles, especially battery vehicles. In the Czech Republic, 98,000 tonnes of non-ferrous metal castings were produced last year. This meant a decrease of about 10%. For aluminium alloy castings, the decrease was about 7%. For heavy copper-based non-ferrous metals, this drop was about 12%.

Aluminium alloy die foundries, like others, have to face price pressures. The sustainability of automotive production in Europe has an impact on the order content, as it has to withstand strong competition from Asian manufacturers who are pushing into our markets. Unfortunately, European legislation is playing into their hands. Modern technology in "pressure" foundries has the advantage of high labour productivity, but the market is experiencing a recession and competition is fierce. Companies fight for every order in a similar way as in the case of ferrous casting foundries.

The beginning of 2024 looked good in terms of order content. Foundries experienced an increase in orders. By the end of March, however, this growth had cooled. Due to the decline in production in downstream industries, strong pressure on prices will continue this year. The impact of environmental decisions such as the Green Deal will not make their activities any easier. The general situation in the foundry industry is not helped by the still never-ending war in Ukraine. The instability of energy and raw material prices makes it difficult to set the prices of castings in the long term.

Figure 1: Czech Ferrous Casting Production (volume)*Figure 2: Czech Non-ferrous Casting Production (volume)*



Economic Background

The Finnish Technology Industry as a whole

The turnover of technology industry companies in Finland decreased by approximately two per cent in 2023 from 2022. Turnover decreased in the electronics and electrotechnical industry and the metals industry. Turnover grew in mechanical engineering, the consulting sector and information technology. Their turnover in Finland amounted to approximately EUR 102 billion in 2023. Last year, turnover began to decline due to lower producer prices. In 2023, average production volumes in the technology industry were on a par with 2022. The monetary value of new orders in the October-December period was 33 per cent higher than in the previous quarter, but 19 per cent lower year-on-year. The large quarter-on-quarter increase is explained by the recovery of order intake from the exceptionally weak intake seen in the third quarter. The balance figure for tender requests in January was -23. Data collected during January indicates that, despite the pick-up in order intake, the overall demand situation in the market remains rather weak. At the end of December, the value of order books was three per cent lower than at the end of September and 16 per cent lower than in December 2022. The value of order books decreased continuously throughout last year. On the basis of order trends at the end of last year, the turnover of technology industry companies is expected to contract over the next six months.

The number of personnel employed by technology industry companies in Finland in 2023 was up 1.5 per cent on average, or 5,000 people, from 2022. On average, the industry employed approximately 335,000 people in 2023. At the end of December, the industry had approximately 334,000 employees. The number of personnel remained fairly stable throughout the year. According to the personnel survey by Technology Industries of Finland, the number of employees affected by lay-off procedures at the end of December was approximately 16,000. The number of lay-offs increased significantly in the fourth quarter. Compared to earlier years, recruitment of new employees remained at a low level in the October-December period. In total, recruitments came to 7,500. Some companies were increasing their payroll, while others were hiring new employees due to retirements and employee turnover. The downturn in the number of personnel at the end of the year and the increase in the number of laid-off employees were expected due to the weaker economic situation. The number of personnel is forecast to keep declining slightly in the first part of the year. It is likely that the number of layoffs will continue to increase.

Mechanical Engineering in Finland

The turnover of mechanical engineering companies (machinery, metal products and vehicles) in Finland increased by four per cent in 2023 from 2022. Their turnover in Finland amounted to approximately EUR 40 billion in 2023. Year-on-year, the value of new orders decreased by 16 per cent. Order intake recovered clearly from the very weak level of the third quarter, but fell significantly short of the previous year. At the end of December, the value of order books was 9 per cent lower than at the end of September and 16 per cent lower than in December 2022. It should be noted that shipyards have an exceptionally large share of the total value of order books.

On the basis of order trends at the end of 2023, the turnover of mechanical engineering companies is expected to contract over the next six months. The number of personnel employed by mechanical engineering companies in Finland grew by 1.2 per cent in 2023 from the 2022 average. The industry employed 137,500 people on average in 2023, approximately 1,700 more than in 2022. At the end of December, the number of personnel was 137,300.

Metals Industry in Finland

The turnover of metals industry companies (steel products, non-ferrous metals, castings and metallic minerals) in Finland decreased by 20 per cent in 2023 from 2022. In 2023, their turnover in Finland amounted to more than EUR 15 billion. Turnover began to fall due to the strong decline in producer prices last year. The total production of steel products, non-ferrous metals, castings and metallic minerals in Finland in the January-November 2023 period remained largely unchanged year-on-year. The number of personnel employed by metals industry companies in Finland grew by 0.3 per cent in 2023 from the 2022 average. The industry employed 16,100 people, approximately 100 more than in 2022. At the end of December 2023, the number of personnel was 16,000.

Foundry Industry in Finland

Foundry industry as a whole

The total production of castings in Finland decreased about 11 % in 2023 from 2022. The production of iron and steel castings was 46.503 tons which is 12 % less compared to year 2022. Iron and nodular iron casting production decreased about 12 % and steel casting decreased about 10 %. Metal castings production was 4.370 tons in 2023, which is about 4 % more than the previous year. The value of the casting production of Finnish foundries in year 2023 was 244 m€, which is 6 % less compared to year 2022. The foundry industry employed 1300 people, 144 less than in 2022.

Table 1: Finnish grey cast iron production

GJL	2023	2022	Change in %
Production (t)	20452	16561	-19 %
Export (t)	6054	602	-90 %
Value of production (m. €)	46,85	26,39	-22 %
Employees	698	558	-20 %

Table 2: Finnish ductile cast iron production

GJS	2023	2022	Change in %
Production (t)	27051	25042	-7 %
Export (t)	9552	5112	-46 %
Value of production (m. €)	83,82	78,06	-7 %
Employees	698	558	-20 %

Table 3: Finnish steel casting production

Steel Castings	2023	2022	Change in %
Production (t)	5428	4900	-10 %
Export (t)	319	968	+300 %
Value of production (m. €)	68,14	67,46	-1 %
Employees	386	363	-6 %

Table 4: the Finnish non-ferrous casting production

Non-Ferrous Castings	2023	2022	Change in %
Production (t)	4370	4531	+4 %
Export (t)	1630	1567	-4 %
Value of production (m. €)	62,48	61,91	+0 %
Employees	361	379	+5 %

Figure 1: Finish Ferrous Casting Production (volume)

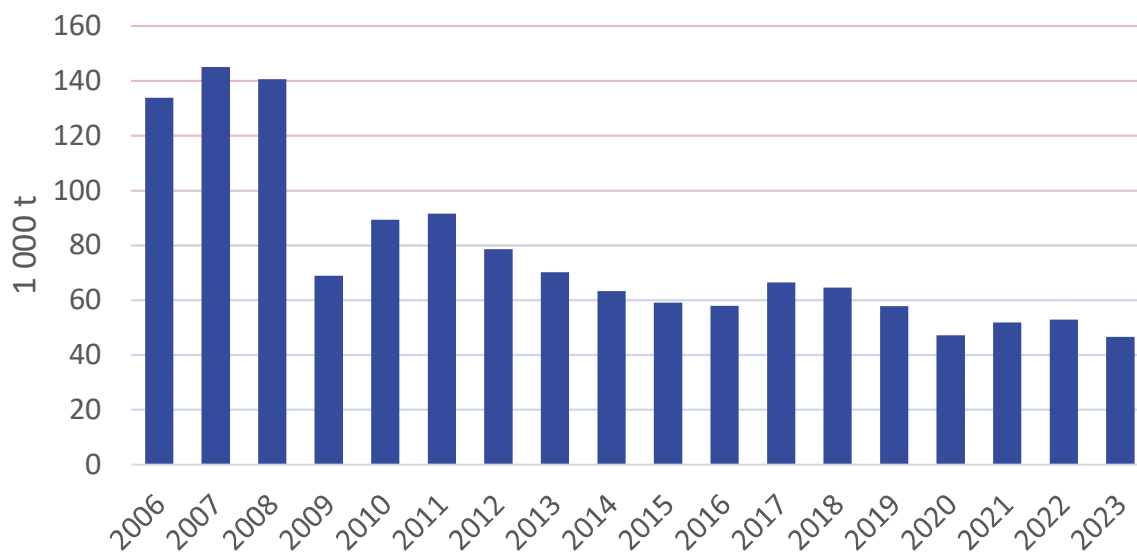
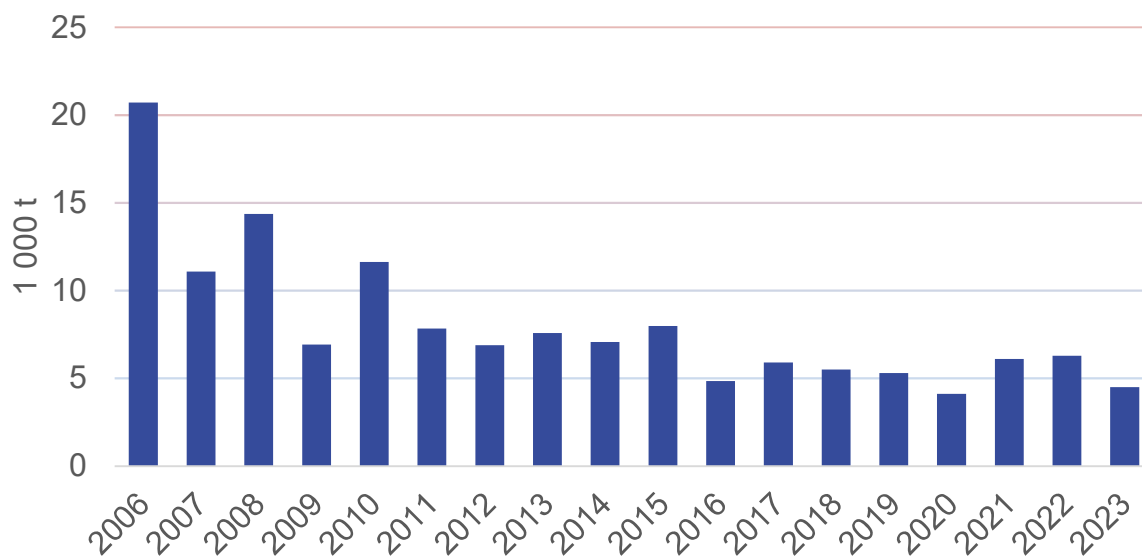
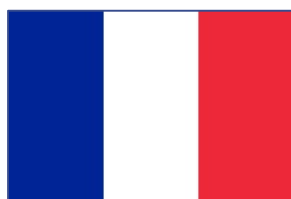


Figure 2: Finish Non-Ferrous Casting Production (volume)





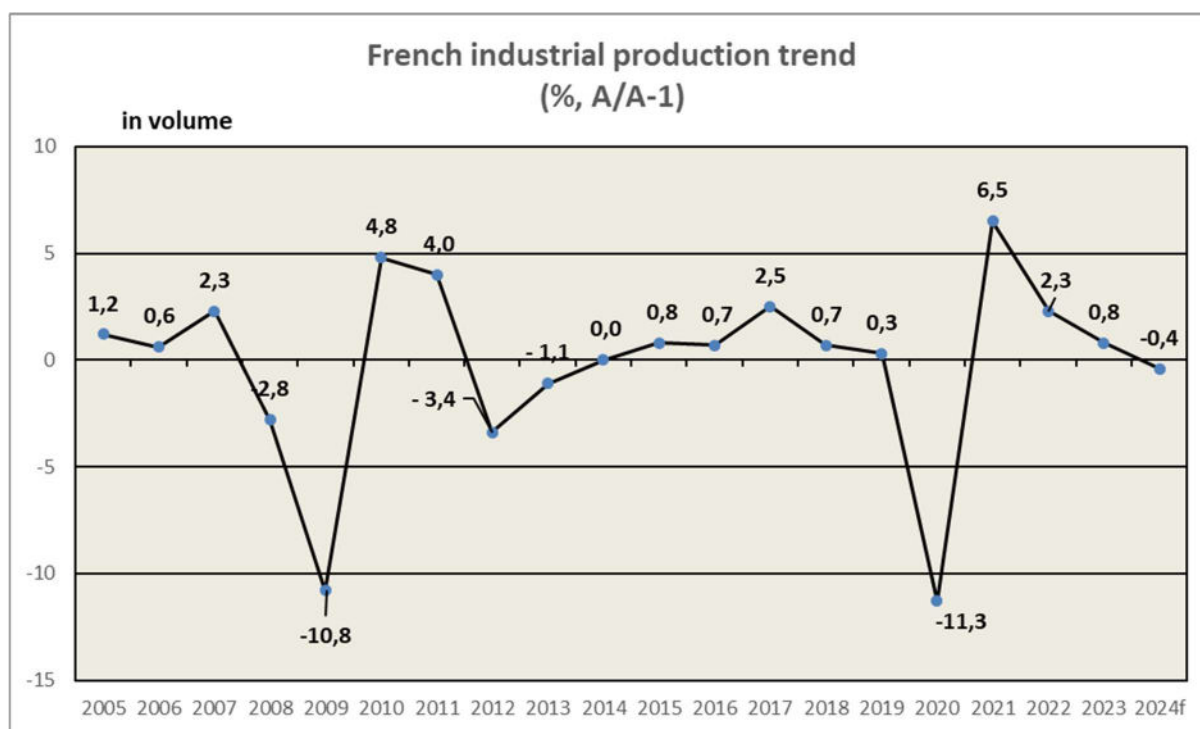
Macroeconomic developments

French GDP increased by +0.9% in 2023. This economic growth is due to the increase in domestic demand. Household consumption increased by +0.8% in 2023. In addition, business investment increased by +2.7% in volume over the whole of 2023.

At the same time, GDP increased by +0.9% for Italy and by +2.5% for Spain in 2023. While Germany is experiencing stagnation in its GDP in 2023.

In this context of growth, inflation increased by + 4,9 % in 2023.

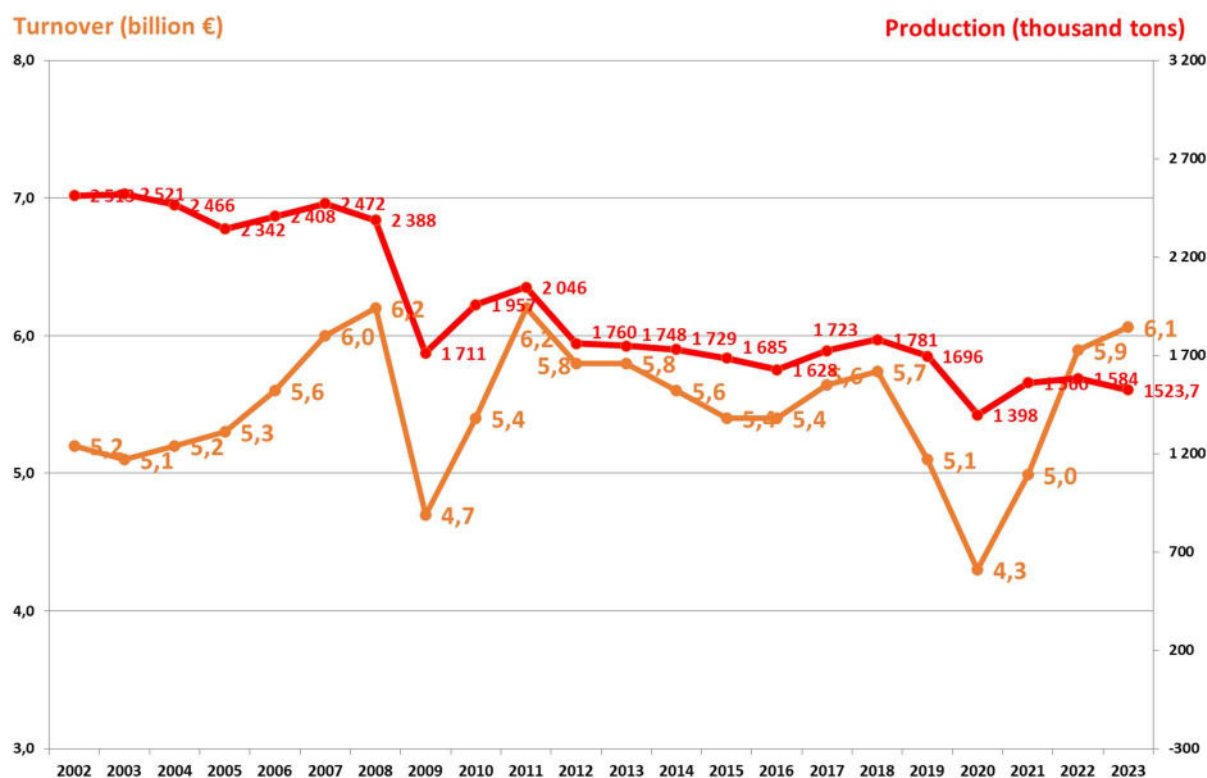
Industrial production increased by + 0,8 % in 2023 after the growth significant of + 2,3 % during the previous year.



Outlook

The French economy is expected to grow further in 2024: +0.8% in volume compared to 2023 (i.e. +2.9% in value). The increase in inflation is expected to slow to around +2.3%. At the same time, the unemployment rate is expected to be limited to 7.5%.

French Foundry Industry Evolution in volume and in value



The turnover of the foundry industries continued to grow in 2023, but production decreased. In total, ferrous and non-ferrous metal foundries produced 1.524 million tonnes in 2023 compared to 1.585 million tonnes in 2022. The activity of all foundry industries, all sectors combined, decreased in 2023 (-3.8% compared to 2022).

Production by alloys

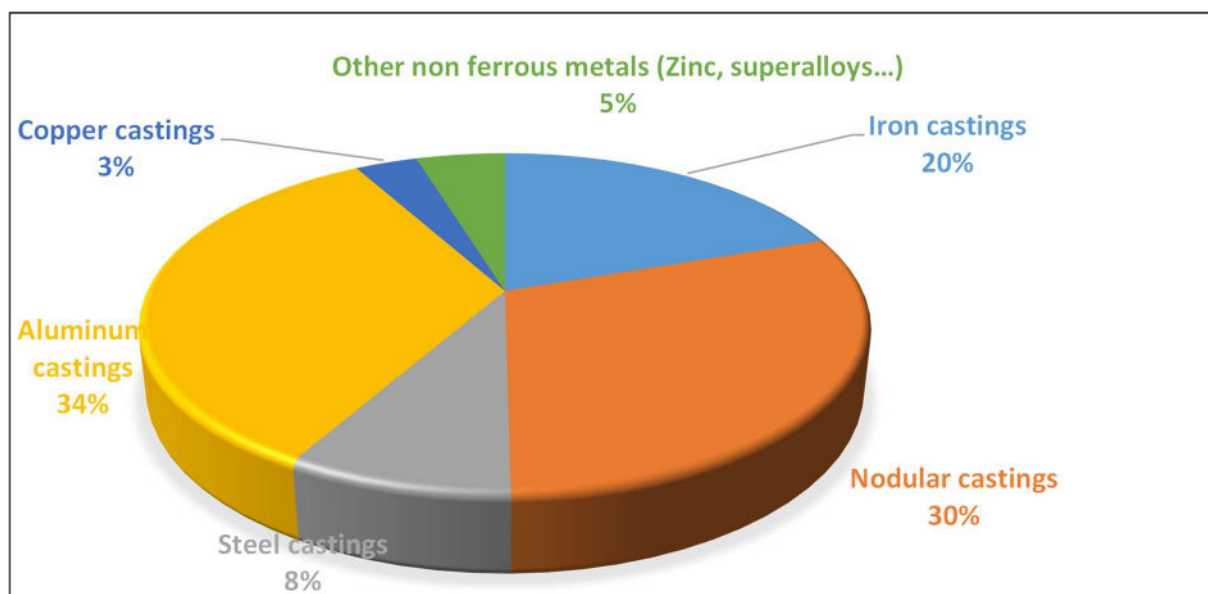
In 2023, the analysis by category shows that the ferrous metal foundry activity recorded a decrease of -6% in volume while the production of non-ferrous metal foundries increased by +3.9. For both categories of activity, total production decreased by -3.8% in 2023.

	2023 production (tons)	2023/2022 (%)
Iron castings	470 350	-7.0%
Nodular castings	650 316	-7.8%
Steel castings	49 385	3.4%
Ferrous metals castings (total)	1 170 051	-6.0%
Aluminum castings	314 267	5.0%
Copper castings	17 696	-4.1%
Other non ferrous metals (Zinc, superalloys...)	21 709	-4.1%
Non ferrous metals castings (total)	353 672	3.9%
Foundry (total)	1 523 723	-3.8%

Segmentation by main alloys (in value)

The total value of the production of the foundry industries is estimated at 6.1 billion euros in 2023. The growth in the foundry turnover is thus + 2.8% in 2023 compared to 2022 despite the drop in production in volume. These different developments are explained by the increase in sales prices recorded by the foundry (+ 7.3% for the year 2023 compared to 2022).

The increase in sales prices, caused by the increase in the costs of raw materials and energy, explains this sustained increase in turnover.



Evolution of employment

The number of employees is estimated at 28,512 at the end of December 2023.
The workforce in the French foundry sector has thus increased slightly in 2023.

The number of companies in the foundry sector is 330 in 2023 (<10 people included).

Figure 1: French Ferrous Casting Production (volume)

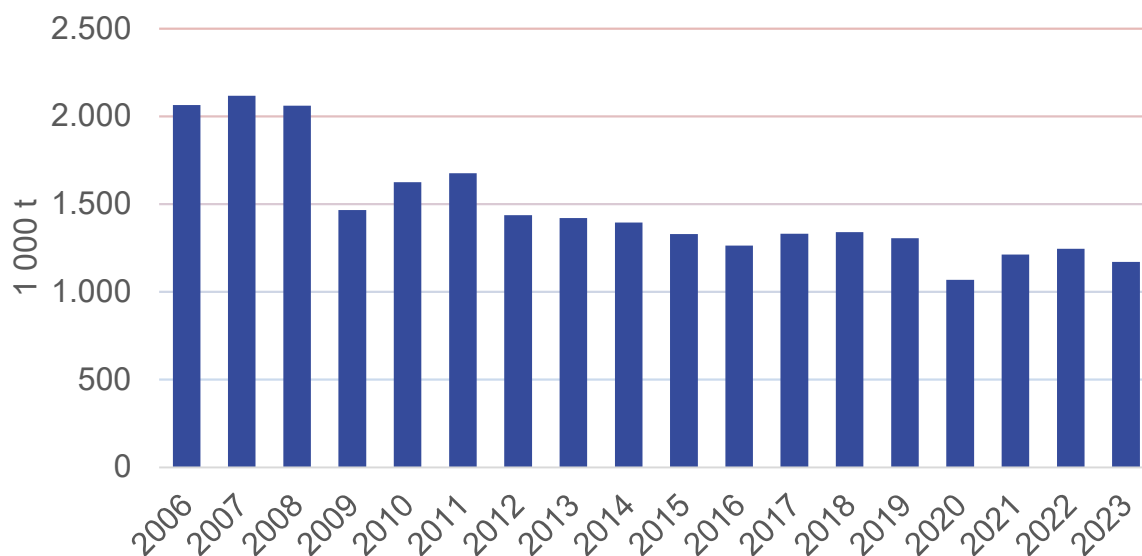
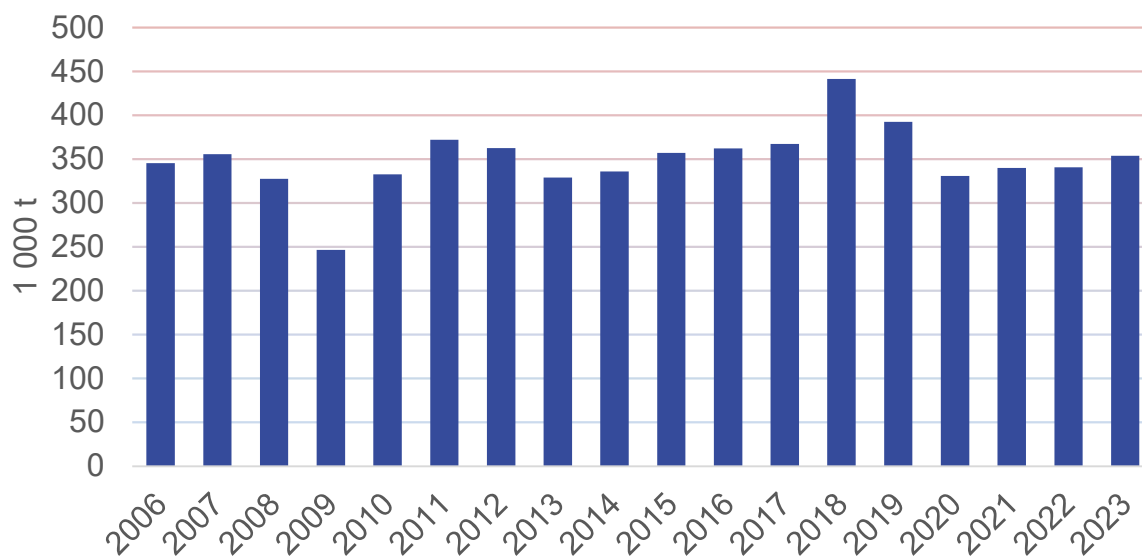


Figure 2: French Non-Ferrous Casting Production (volume)





The German Economy and the Casting Customer Industries

Macroeconomic developments

The inflation-adjusted Gross Domestic Product (GDP) in 2023 was 0.3 percent lower than the previous year. The overall economic development in Germany stalled in 2023 within a still crisis-laden environment. High prices at all levels of the economy dampened economic activity. Additionally, unfavorable financing conditions due to rising interest rates and reduced domestic and international demand further contributed to the slowdown. As a result, the recovery of the German economy from the significant downturn in the pandemic year of 2020 did not continue.

The development of gross value added varied across different economic sectors in 2023. The industrial sector, excluding construction, saw a significant decline in economic output, down by 2.0 percent overall. A key factor was the substantial reduction in production within the energy supply sector. The manufacturing industry, which accounts for nearly 85 percent of the industrial sector (excluding construction), also experienced a decrease in inflation-adjusted terms (-0.4 percent) in 2023. Positive contributions mainly came from the automotive industry and other vehicle manufacturing. In contrast, production and value creation in energy-intensive industries, such as the chemical and metal industries, declined again, following a sharp downturn in 2022 due to rising energy prices.

Most service sectors were able to expand their economic activities compared to the previous year, thereby supporting the economy in 2023. However, the overall increase was weaker than in the previous two years.

Private consumption, in the face of high consumer prices, decreased by 0.8 percent in real terms in 2023 compared to the previous year. The declines were particularly evident in areas where prices either remained at a high level from the previous year or increased further during the year. Consequently, inflation-adjusted spending on durable goods, such as furniture and household appliances, dropped sharply (-6.2 percent). Additionally, for the first time in almost 20 years, the government reduced its inflation-adjusted consumption expenditures (-1.7 percent) in 2023. This was primarily due to the discontinuation of government-funded COVID-19 measures, such as vaccinations and compensation payments for available hospital beds. In the years following 2020, government consumption had supported economic activity through such measures.

The economic output in 2023 was generated by an average of 45.9 million employed persons working in Germany, an increase of 0.7 percent or 333,000 people compared to the previous year, marking an all-time high. Employment growth in 2023 was partly driven by the immigration of foreign workers and an increase in labor force participation among the domestic population. These positive effects outweighed the dampening effects of demographic changes. The increase in employment occurred almost exclusively in the service sectors.

According to preliminary calculations, government budgets ended the year 2023 with a fiscal deficit of 82.7 billion euros, approximately 14 billion euros less than in 2022 (96.9 billion euros). The federal government, in particular, was able to significantly reduce its fiscal deficit compared to the previous year.

The situation in the major casting customer industries

In 2023, the domestic market reached a registration level of 2.8 million passenger cars. Overall, new registrations increased by approximately 7% compared to the previous year. A significant factor influencing the development of the German car market was the expiration of the environmental bonus for company vehicles on August 31, 2023. However, the market remains about 20% below pre-crisis levels of 2019. Domestic orders were down by 4% in 2023. Passenger car production saw a significant increase in 2023. With 4.1 million vehicles produced, there was an 18% rise in production compared to the previous year. Despite this growth, production levels are still noticeably 28% lower than in the mid-2010s. The key driver of production growth in 2023 was the Battery Electric Vehicle (BEV) segment, with 0.93 million vehicles produced, representing a growth rate of approximately 59% by the end of the year. Production in other vehicle segments reached 3.2 million units, only 10% higher than the previous year. However, when looking at internal combustion engine vehicles and plug-in hybrids (PHEVs), production volumes are still 30% below 2019 levels and 45% below the record years of 2015/16. In contrast, BEV production has increased eighteenfold over the same period.

According to the VDMA, order intake in the mechanical engineering sector in 2023 fell short of the previous year's level by 13.0%. In 2023, inflation-adjusted production output declined by 1%, primarily due to dwindling order backlogs. By the end of the year, capacity utilization in the mechanical engineering sector had already dropped below the long-term average.

Crude steel production in Germany dropped in 2022 with a decrease of 8% to 36.8 million tons. Noting the losses from 2018-2020, production in 2022 was around 15% below the 2017 level (43.3 million tons).

In the construction industry, the persistently high construction costs and labour shortages have been compounded by increasingly unfavourable financing conditions. This has particularly impacted the building construction sector. In contrast, production in civil engineering and finishing trades has increased. Overall, the construction industry achieved a small inflation-adjusted growth of 0.2 percent in 2023. Construction investments decreased by 2.1 percent in real terms in 2023. Alongside high construction prices, the significant rise in interest rates for construction loans has notably slowed down residential construction. Positive signals came only from the finishing trades, likely due to the strong demand for energy-efficient renovations. In contrast, investments in equipment—primarily machinery, tools, and vehicles—increased significantly in real terms compared to 2022, with a rise of 3.0 percent.

Developments in the foundry industry

In 2023, the iron and steel foundries recorded a production decline of 1.4%, reaching 3.077 million tons. Non-ferrous metal foundries, on the other hand, experienced a 2.9% increase in production, totaling 0.834 million tons.

The foundry industry generated revenues of €7.8 billion on the iron and steel side and €6.2 billion on the non-ferrous metals side in 2023. Overall, the foundries achieved a revenue growth of 1.2%.

The average capacity utilization (calculated at the beginning of each quarter) was 83% in 2023, which is below the average level of 89% recorded in 2022.

In 2023, production in iron and steel foundries declined by 2.8%, reaching 3.033 million tons. Component production for the automotive industry increased by 2.0%, totaling 1.759 million tons. Companies producing cast parts for the mechanical engineering sector saw a significant decrease of 11.2%, manufacturing only 0.722 million tons compared to the same period in 2022. The production of other cast components, including construction castings, pipes, and steel mill requirements, fell by 5.2% to 0.552 million tons, although there are reporting discrepancies between mechanical engineering castings and "Other" categories.

In 2023, the iron and steel foundries ended the year with a lower demand volume compared to 2022, reaching 2.598 million tons, a decline of 13.0%. Demand from customers in the road vehicle sector decreased by 8.7%, totaling 1.512 million tons. Orders from the mechanical engineering sector dropped significantly, falling by 21.9% to 0.618 million tons compared to the previous year. Orders for other cast components were 13.3% lower than the previous year, with a volume of 0.469 million tons. It is important to note the reporting discrepancies between mechanical engineering castings and the "Other" category. The export ratio was 43.3%, with a total of 1.312 million tons exported, reflecting a 1.7% increase compared to the previous year.

By the end of December 2023, the order backlog stood at 1.256 million tons, a decrease of 15.2% compared to the end of December 2022.

In 2023, German non-ferrous metal foundries produced 0.834 million tons, marking a 2.9% increase compared to the previous year. Production in aluminum foundries rose by 3.9%, reaching 0.731 million tons. In contrast, the casting of magnesium alloys dropped significantly by 31.0%, totaling 9,100 tons during the same period. The production of components made from copper and copper alloys increased by 2.5%, reaching 66,700 tons. However, the casting of components made from zinc alloys declined by 6.2% to 27,000 tons compared to the previous year.

In 2023, non-ferrous metal foundries in Germany recorded a demand level of 0.813 million tons, a decrease of 1.7% compared to the previous year. Demand from the road vehicle sector increased by 1.4%, reaching 0.622 million tons. In contrast, order interest from the mechanical engineering sector, traditionally a smaller volume, fell sharply by 39.7%, totaling only 5,600 tons compared to 2022. Orders for other cast components decreased by 9.1% to 0.185 million tons.

Direct exports amounted to 103,100 tons, which is 2.7% lower than in 2022. The order backlog at the end of December 2023 was 0.178 million tons, reflecting a 1.6% decline compared to the same time last year.

The employment situation

As of December 2023, Germany's foundries (ferrous and non-ferrous) employed circa 67 400 persons, 3.4% less than at the end of 2022. This figure corresponds with 346 foundries (survey cut-off at <50 employees per company).

At the end of 2023, 526 foundries (ferrous and non-ferrous, no cut-off) were operating in Germany.

The Situation in the Material Sectors

Grey cast iron

Throughout 2023, production increased by 0.5% to 1.837 million tons. The output of motor vehicle components increased by 0.1% to 1.247 million tons. The volume of casted parts for mechanical engineering increased by 4.4% to 401,400 tons. Other grey iron components (including moulds and railway parts, fittings, and components for the steel industry) reached an output volume of 188,200 tons (-8.4%).

Iron foundries received orders for approximately 1.064 million tons of castings from the motor vehicle industry, which is a 6.4% decrease. The demand of the mechanical engineering industry reached a volume of 327,000 tons. Thereby, the orders dropped by 14.2%. Orders for parts for miscellaneous applications made of cast iron reached a volume of 147,600 tons, 14.8% less than in the preceding year.

At the end of December 2023, the order backlog amounted to more than 779,000 tons, 11.1% lower compared to the end of December 2022.

Ductile cast iron (nodular and malleable)

At 1.104 million tons, the production of ductile iron castings was decreased by 4.1% compared to the year before. A separate calculation of nodular and malleable castings is not possible, because of the low volume of malleable castings. Nonetheless, malleable castings have their specific markets. The output of motor vehicle components increased by 5.2% to 502,300 tons. The volume of casted parts for mechanical engineering decreased by 14.7% to 345,000 tons. Other components reached an output volume of 256,600 tons (-4.6%).

At the ductile iron sector, the volume of incoming orders reached 0.965 million tons (-16.8%). Ductile iron foundries received orders for more than 437,400 tons of castings from the motor vehicle industry, which is a decrease of 14.0%. With minus 21.2% compared to the order volume received the year before, the demand of the mechanical engineering industry reached a volume of 301,100 tons. Orders for parts for miscellaneous applications made of ductile cast iron reached a volume of 226,500 tons, 15.6% less than in the preceding year.

At the end of December 2023, the order backlog amounted to 451,400 tons, 19.5% more compared to the end of December 2022.

Steel

Throughout 2023, production of steel castings decreased by 3.6% (136,700 tons).

At 122,500 tons, the volume of orders received by the producers of steel castings in 2023 decreased by 10.6% compared to the year before.

At the end of December 2023, the order backlog amounted to 36,400 tons. The order cushion was 17.8% lower compared to the end of December 2022.

Non-ferrous Metal Castings

In 2023 the production of aluminium castings increased by 4.0% (731,500 tons). For the magnesium sector the production reached a level of 9,100 tons (-31.1%). The output of copper castings rose by 2.5%. The level was more than 66,700 tons. Nearly 26,900 tons of zinc castings were produced, marking a decrease of 6.4%.

Aluminium foundries received orders for 715,500 million tons (-0.0%). 86.1% of the demand (614,900 tons) came from the vehicle industry. Down by 32.6% compared to the order volume received the year before, the demand of magnesium castings reached a volume of 9,100 tons. Orders for parts made of copper castings reached a volume of 65,600 tons, 8.9% lower than the year before. Foundries producing casted parts from zinc logged an order level of 23,700 tons (-8.5%).

Source: BDG, Stat. BA, VDA, VDMA, Worldsteel, Kraftfahrt Bundesamt, ZDB, IFO, WV Stahl

Figure 1: German Ferrous Casting Production (volume)

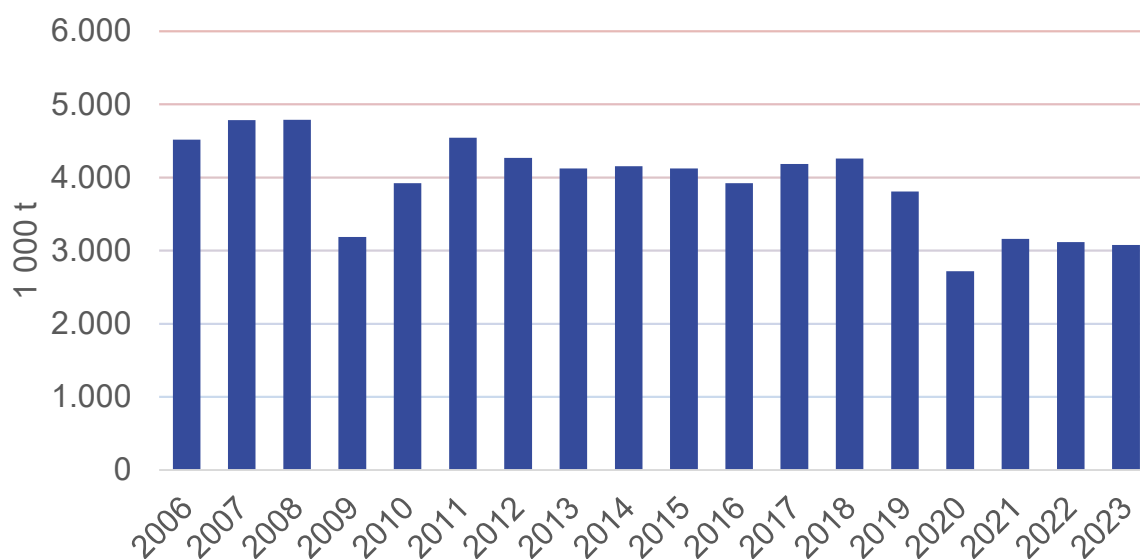
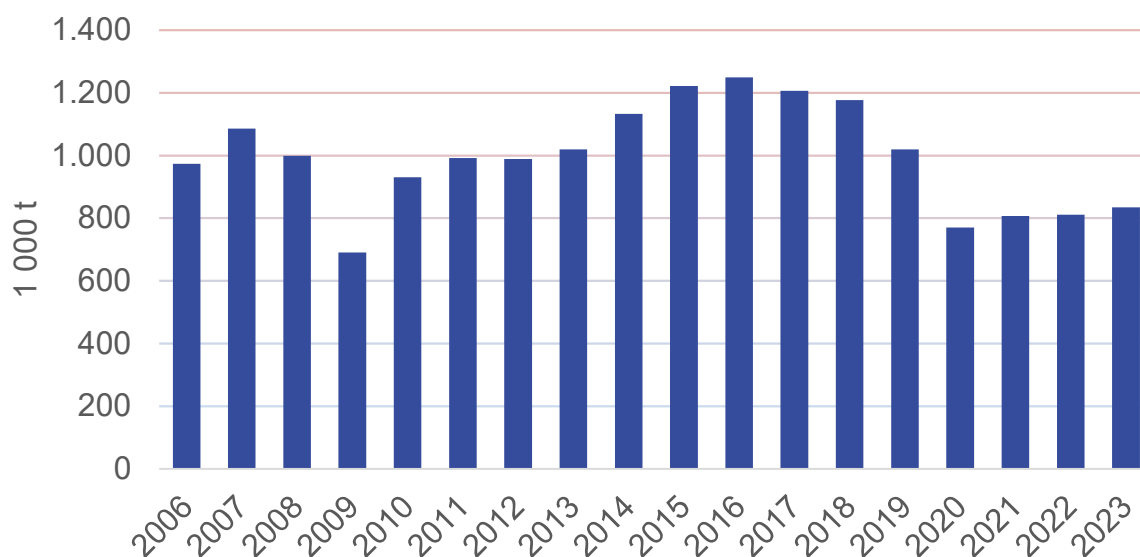


Figure 2: German Non-Ferrous Casting Production (volume)





Macroeconomic developments

In the 2023, Italy's GDP rose by 0.9 per cent at constant prices. The sharp deceleration compared with 2022, when GDP grew by 4.0 per cent, was fruit of the fading recovery in the activities most affected by the pandemic, of weak global demand and of tighter monetary conditions.

The slowdown in international trade had an impact on industry excluding construction, with the greatest decline seen in the most energy- intensive production. The recovery in services dimmed, owing to a smaller boost from the tourism and recreation sector and the decline in demand linked to the fall in industrial activity. Value added on the other hand, continued to rise in real estate and technical-professional consultancy services, as well as in the construction sector, all of which benefited most from spending measures under the National Recovery and Resilience Plan (NRRP) and incentives to upgrade and improve the energy efficiency of buildings.

The marked slowdown in energy price growth drove the disinflation process, which began at the start of 2023 and gained strength in the autumn, when inflation returned to below 2.0 per cent.

In the first quarter of this year, GDP continued to rise (0.3 per cent quarter on quarter, according to preliminary estimates), driven by net foreign demand and by the expansion in activity in all the main sectors. Inflation remained low, falling to 0.9 per cent in April; core inflation stabilized at 2.2 per cent.

Firms

Value added rose in Italy last year, albeit to a lesser extent than in the previous year. Activity continued to expand in services, especially thanks to the further recovery in the high-contact industries, which were the most penalized by the pandemic, such as recreation and accommodation. By contrast, activity in industry excluding construction declined, reflecting weak international demand (especially from Germany) and the lingering effects of past energy price increases. Growth was even stronger in the construction sector, driven by government incentive schemes.

Profitability continued to rise, with ample liquidity margins. Firm debt, which is falling, is still low by international standards. Bank lending decreased due to both lower demand for loans and the adoption of stricter credit supply policies by banks. Credit became more difficult to access, especially for small firms. The process of rebalancing the financial structure of firms that has been under way for more than a decade could be affected by the discontinuation of the allowance for corporate equity (ACE), if it is not replaced by other measures geared towards promoting capitalization.

The shift in the structure of production towards larger firms, which has been helped along by a greater presence of multinational corporations in Italy, could foster the expansion in growth potential over the long term, countering the weak productivity growth that has characterized the last two decades. A further boost could come from the gradual increase in spending on research and development, which is still very small as a percentage of GDP by international standards.

Despite widespread improvements in the level of digitalization of firms and the installed capacity of renewable energy sources, Italy, like other countries, is still far from reaching the targets set at European level. The launch of the REPowerEU plan could accelerate the removal of administrative and infrastructure barriers to the development of renewable sources.

The labour market

Employment continued to expand at a fast pace in 2023. Demand was driven by moderate wage growth, which made labour relatively cheaper than other inputs, whose prices soared in 2021-22.

The rise in the number of persons employed was broad-based across most sectors. Industry excluding construction and services were the leading contributors to growth, while employment in construction slowed, after it had significantly expanded in recent years.

Among payroll employees, the increase was limited to permanent positions; meanwhile, the share of part-time employees who would rather work full time fell. Compared with the pre-pandemic period, employment growth did not translate into an improvement in the composition of the labour force, which remains tilted towards lower- skilled workers; in the coming years, the adoption of AI-enabled technologies could affect labour demand, especially for knowledge workers. The ratio of corporate vacancies to total job seekers - an indicator of the level of competition for workers - remained high.

The unemployment rate declined again, to one of the lowest levels in 20 years. According to preliminary estimates, employment slowed in the first few months of 2024, expanding in line with GDP.

Prices and costs

In 2023, consumer price inflation fell rapidly from its end-2022 highs, averaging 5.9 per cent on an annual basis. It has been below 2 per cent since last October. Energy prices, which accounted for around two thirds of headline inflation in 2022, experienced significant declines. Core inflation (excluding food and energy) rose in the first part of the year, largely due to the pass-through of past energy price increases and fell considerably thereafter.

The annual growth rate of hourly labour costs in the non-farm private sector rose last year, but remained below the euro-area average, with contractual wages accelerating and other components of remuneration moderating.

As energy prices fell further, consumer price inflation dropped to very low levels in early 2024; core inflation also declined further, to just above 2 per cent. The gradual fading of commodity and intermediate goods price pressures as well as weak demand, which is partly due to monetary tightening, should keep inflation low, although negotiated wage growth is expected to pick up further.

Foreign trade, competitiveness, and the balance of payments

Amid weakness in global trade, Italy's exports of goods fell in 2023, but remained well above their pre-pandemic level; exports of services, on the other hand, continued to rise, driven by foreign tourism in Italy and business services. Imports of goods declined, particularly from non-EU countries including Russia and China, due in part to the increasing fragmentation of international trade; by contrast, purchases of low-carbon technology goods picked up. Overall, net exports made a slightly positive contribution to economic growth.

The current account returned to a surplus (0.5 per cent of GDP), mostly owing to lower imported energy prices. The improvement in the goods and services balances was offset by a deterioration in the primary income balance, which was affected by rising interest rates.

Developments in the foundry industry

Italian foundries, on the whole, closed 2023 with considerable resilience: a 0.6% drop in production led to the loss of about 11,000 tons on the volumes of the previous year. The setback was clearer in turnover, which dropped by 1.8% on 2022 values.

Going beyond aggregate considerations, however, the statistics show a discontinuous trend throughout the year not only between the different production specialisations, but also within the same segment.

In 2023, ferrous foundries performed more disappointingly on average than non-ferrous foundries, both in terms of production output as well as turnover.

Contributing to the decline in ferrous castings was the downturn recorded by iron castings, while for non-ferrous castings the greatest growth boost came from zinc and copper alloy castings, with a smaller contribution from aluminium, which had a somewhat subdued 2023.

Variable	2023	% change
Ferrous and non-Ferrous castings production (tons)	1,861,720	-0.6
Turnover (€ millions)	7,637	-1.8

Source: CSA analysis from internal studies and ISTAT contributions

Figure 1: Italian Ferrous and Non-Ferrous Casting Production (volume in tons) and % change y o y

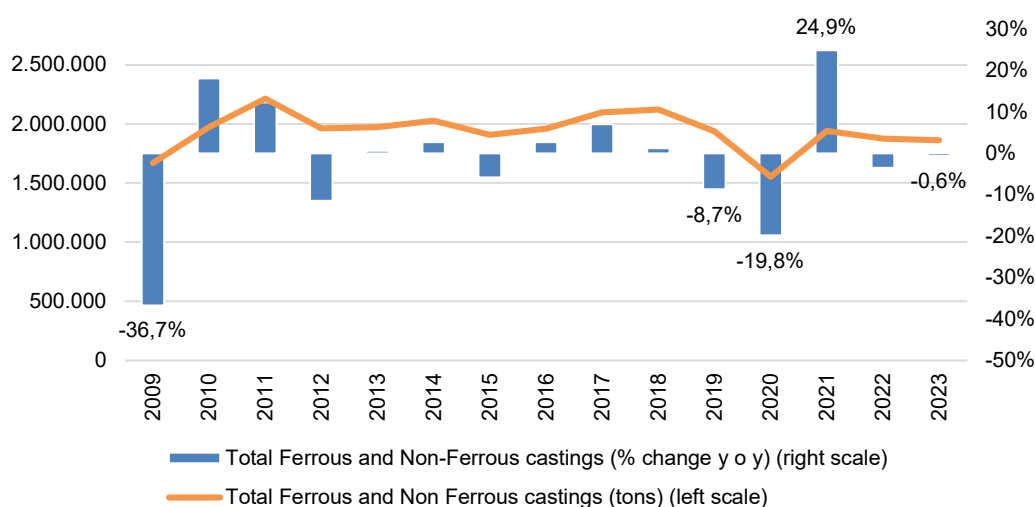
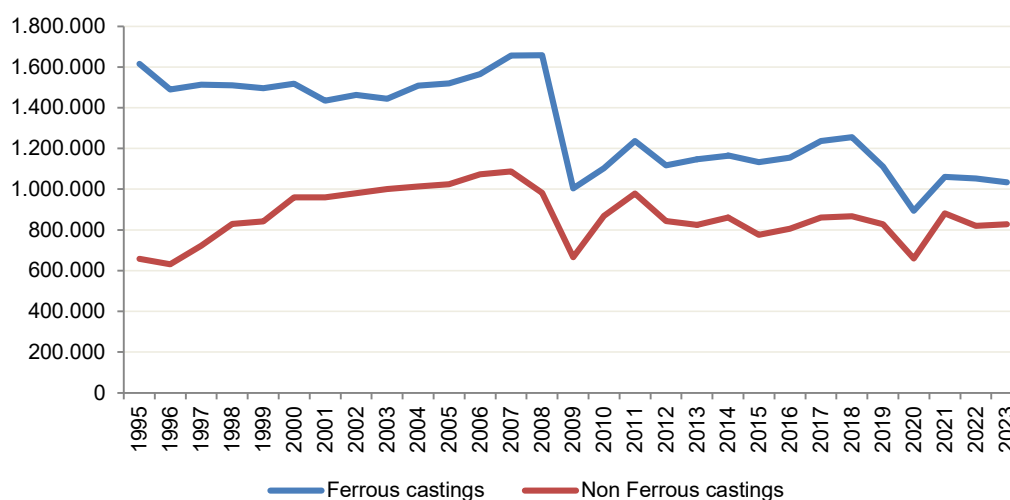


Figure 2: Italian Ferrous and Non-Ferrous Casting Production (volume in tons)



Ferrous foundries

Variable	2023	% change
Ferrous castings production (tons)	1,033,753	-1.8
Turnover (€ millions)	2,851	-3.8

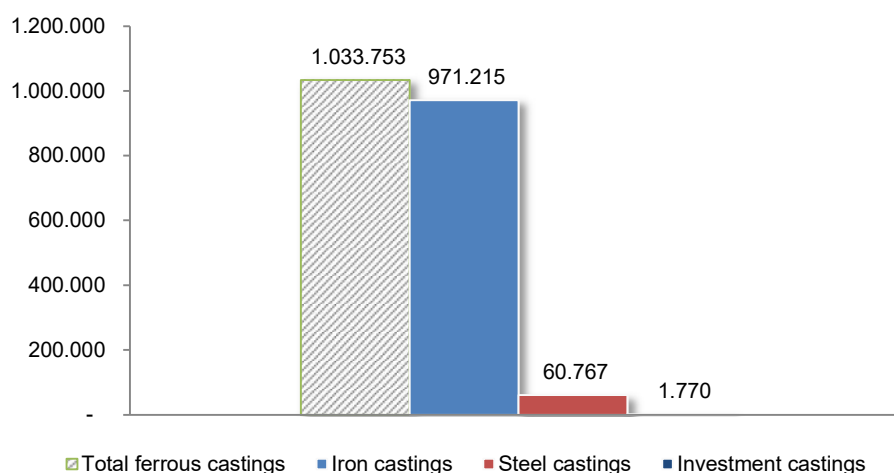
Source: CSA analysis from internal studies and ISTAT contributions

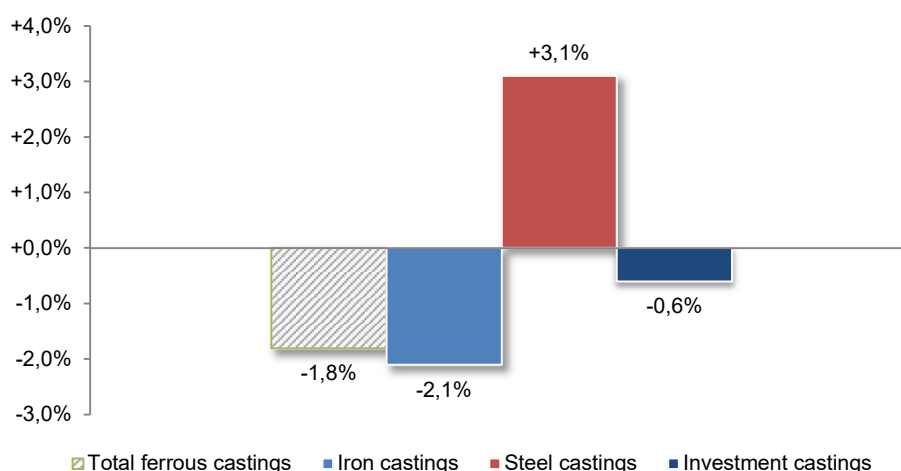
The 159 ferrous casting foundries represent only 18% of the Italian foundry industry in numerical terms, but make 37% of total turnover and produce 56% of volumes.

In 2023 the total output stood at 1,033,753 tons of ferrous castings, of which 94% in iron. The total turnover generated by ferrous foundries was 2.85 billion euros: a figure down by 3.8% on 2022 mainly due to raw material price retracement. Volumes instead fell by 1.8%.

As often is the case with ferrous castings, the performance of steel foundries in 2023 was contrary to that of iron foundries, with a variation in the opposite direction (+3.1% vs. -2.1%).

Figure 3: Italian Ferrous Casting Production (volume in tons) 2023 and % change 2023 vs 2022





Foreign trade

The 2023 slowdown in the global economic cycle was also reflected in the foreign trade of ferrous foundries, which saw exports fall by 8% in volume and by 4% in value. The most evident effects were seen in the volumes exported to some of the main destination markets for ferrous castings, such as the United States (-14%), France (-11%), Austria (-6%), United Kingdom (-36%), Spain (-8%) and Poland (-20%).

Unexpected were the dynamics of Italian exports of ferrous castings to the second destination market, namely Germany (USA in first place), whose difficult economic situation suggested a sharp drop. In reality, exports went down, but the drop was only by 1% in volume and they actually went up in value (8%).

Iron castings

Having closed a positive 2022 from a final results viewpoint, albeit marked by the major difficulties encountered due to the energy crisis, in 2023 Italian iron foundries showed an unsatisfactory growth trend within a particularly weak situation for the sector on a European level.

After a first quarter marked by a phase of considerable growth, which also highlighted significant production growth rates, the resumption from the summer break started to reveal the initial signs of slowing production rates, which progressively led to a real standstill, becoming fully apparent in October-December, with a significant drop on the same period of the previous year.

Thanks to the positive momentum in the first part of the year, 2023 witnessed production substantially hold up, limiting the average decrease to -2.1%, naturally with different trends depending on the destination sector.

2024 is also shaping up to be a complex year, with forecasts of further erosions in production volumes due to significant risks linked first and foremost to uncertainties regarding demand for finished products in downstream markets, to the increasingly critical geopolitical landscape, to tensions in production input markets both in terms of supplies as well as price tensions.

It must be said that the difficulties of 2023 affected the entire European foundry industry.

Turning to the figures, in 2023 a total of 971,215 tons of iron was produced, of which 610,895 tons of grey iron (-0.8%) and 360,321 tons ductile iron (malleable and spheroidal) (-4.2%). The production of grey iron castings in 2023 counted for 63% of the total, earning on percentage point on the mix of 2022; the production of ductile iron stood at 37%.

The production of castings for the mechanical engineering industry in 2023 registered a drop of over 4%. This production segment is the top end market for iron castings and counts for 53% of total volumes, equal to about 512,608 tons.

A reflective moment also for the volumes produced by automotive foundries, which were affected by the strong downturn in the downstream market.

The transport industry in 2023 counted for 291,268 tons of iron castings, i.e. 30% of the total output. For that production segment, the year closed with a drop of 0.6%.

In 2023, positive signs came from minor industrial sectors in terms of their ability to absorb iron castings. The positive contribution to the general average performance of iron castings can be attributed to the "other uses" category (+2.8%), to construction (+1.9%) and to steel (+1%), which counted for 6% (59,752 t), 8% (73,887 t) and 3% (33,701 t) respectively of the total output of iron foundries in respectively in 2023.

The demand for castings highlighted progressive signs of weakness starting from the last quarter of 2023 and, for the entire part of the current year, it has not shown any significant changes in trend. Of the main client sectors, there was a clear slowdown in construction, after the boom of the previous years; a serious drop in order intake came from the machine tools, mechanical engineering, tractors and earth-moving equipment, and from steel making sectors. Bucking this trend was the rebound in the automotive sector, most likely destined to fade as it reflected the fulfilment of previous orders.

After the vigorous jump in turnover in 2022, occurring in a year marked by exceptional tensions in production input markets, for iron foundries 2023 closed with an average drop of 7.7%.

Steel castings

The short-term trend for steel castings in 2023 is difficult to interpret due to the wide gap between the performance of individual companies, even in the same sector of specialization.

On the overall sector average, growth was positive and over 3%, which enabled the output of steel castings to reposition itself over 60,000 tons, confirming a good trend for the sector, similar to that of 2022 (+3.8%).

In terms of volumes, steel foundries produced a total of about 60,767 tons of castings. Of the main types of alloy in which the sector is traditionally broken down, carbon steels and, to a less extent, stainless steels, made a greater contribution to the total result. Steel alloys, instead, closed negatively.

In addition to having the best performance in the Italian ferrous industry, in 2023 the steel foundry sector had one of the best results even compared to its main competitors in Europe. Italy's advantage is clear compared to Germany, which closed last year with a significant loss of 18.2 % in terms of volumes.

Among the various production destinations, the minus sign persists for steel castings destined for construction (-6.3% on 2022), for steel making (-4.4%) and for other uses (-4.8%). Coming under the former category are castings for quarries, mines, machinery for construction, the production of cement and castings directly used in the realization of public works and earth moving, while the demand for classified castings for steel making is fueled both by new investments into machinery for steel making and metallurgy in general, as well as for machinery spare parts.

The quantities produced for transport grew by 9.1%, which also takes the rail and ship industry into account.

Also, regarding turnover, the steel foundry segment stood out last year for having a double figure growth rate of 14.5% which followed the 19.9% jump of the previous year.

Investment castings

After the 2022 recovery in production (+23% on the previous year), 2023 was, for investment casting, a peculiar year which again saw another extraordinary performance in the output of castings made in non-

ferrous and super alloys (+12%), yet a highly declining trend in the production of steel investment castings destined mainly for the transport and mechanical sector (-10%). On the general average for the sector, volumes in kg were basically unchanged, while turnover registered a double-digit increase (+30%).

The production mix of this sector, as highlighted on other occasions, is evolving towards a gradually increasing focus on super alloys and non-ferrous metals, thanks also to major uptake by the aeronautic market.

Non ferrous Foundries

c	2023	% change
Non-ferrous castings production (tons)	827,967	+0.9
Turnover (€ millions)	4,786	-0.5

On the national front, non-ferrous foundries count for 82 of the Italian foundry industry in terms of companies, 61% in terms of workforce; they make 63% of total turnover and produce 44% of the total volume of castings.

In 2023, after a major slowdown for non-ferrous foundries in 2022, production basically remained at the previous year's volumes.

The results seen last year have a positive sign, but with a modest growth rate in terms of volumes (+0.9%) and a total output that stood at just over 820,000 tons.

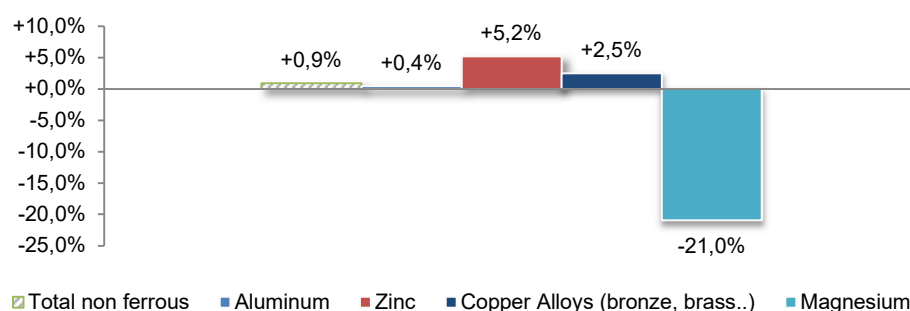
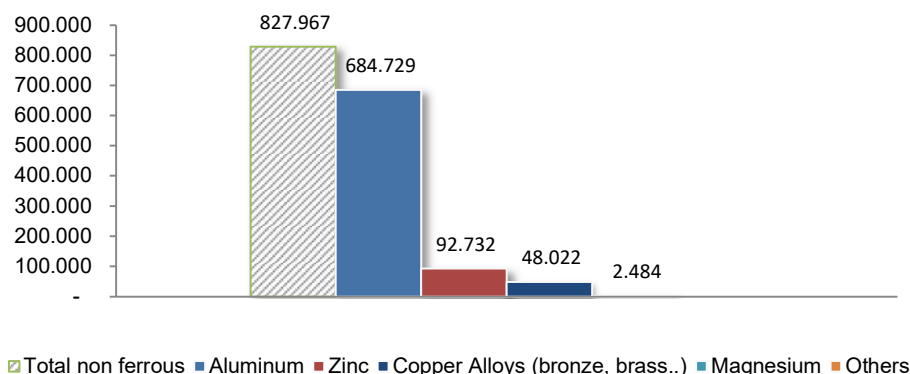
The biggest boost to growth came from zinc castings and copper alloys, with a smaller contribution from aluminium, which had a somewhat subdued 2023.

The positive sign marked all metals, although the extent of the variation greatly differed, except for magnesium, which plummeted.

The historical series of non-ferrous casting production over the last twenty years allows us to examine what stage the sector is currently at and to retrace the various development stages.

In the first years of 2000 non-ferrous foundries experienced a long phase of production expansion, which peaked in 2007. The compound annual growth rate (CAGR) during this time was about +2%. It was precisely in this period that Italy reached its record in terms of tons produced (almost 1.1 million tons), replacing Germany to become European leader.

Figure 4: Italian Non Ferrous Casting Production (volume in tons) 2023 and % change 2023 vs 2022



Having reached the peak, with the 2009 global economic recession a phase of progressive erosion of volumes began for the sector which, from 2011 to 2019, cost an average annual loss of 2%. During this period of decline, exacerbated by the 2020 pandemic, the sector underwent a major levelling off in production output, which averaged around 840,000 tons over the past three years.

Aluminium output stood at 684,729 tons with a growth rate of 0.4% on the previous year. A much stronger growth affected the production of zinc and alloy castings (92,732 tons), with an increase of 5.2%.

The red metals category (copper, brass and bronze) grew on average by 2.5% on 2022. The production level for the latter stood at about 48,022 tons.

The volume erosion of magnesium castings continues, which, at just over 2,000 tons per year, is now only marginally represented. The 2023 loss, equal to -21%, is added to the -42% loss of 2022. The historical development of this alloy shows that in the past twenty years, the magnesium castings sector suffered a veritable collapse, moving from 16,000 tons to the current 2,000 tons.

Almost 470,286 tons were destined for automotive industry in 2023 and growth was 2.3% on the volumes of the previous year. Among the other production sectors, construction, which absorbs 16% of non-ferrous castings, achieved an increase of 1.5% with 133,303 tons produced. The general engineering industry, which accounts for 7% of the total, had a negative contribution (-6.7% with 61,270 tons). The durable goods category (electric appliances etc.) for which 62,098 tons of castings were made, suffered a decline of 5.4%, while electrical engineering, with its 74,517 tons, was positive with an average annual increase of 0.9%.

Sources: ASSOFOND - Statistical and economic office

Figure 1: Italian Ferrous Casting Production (volume)

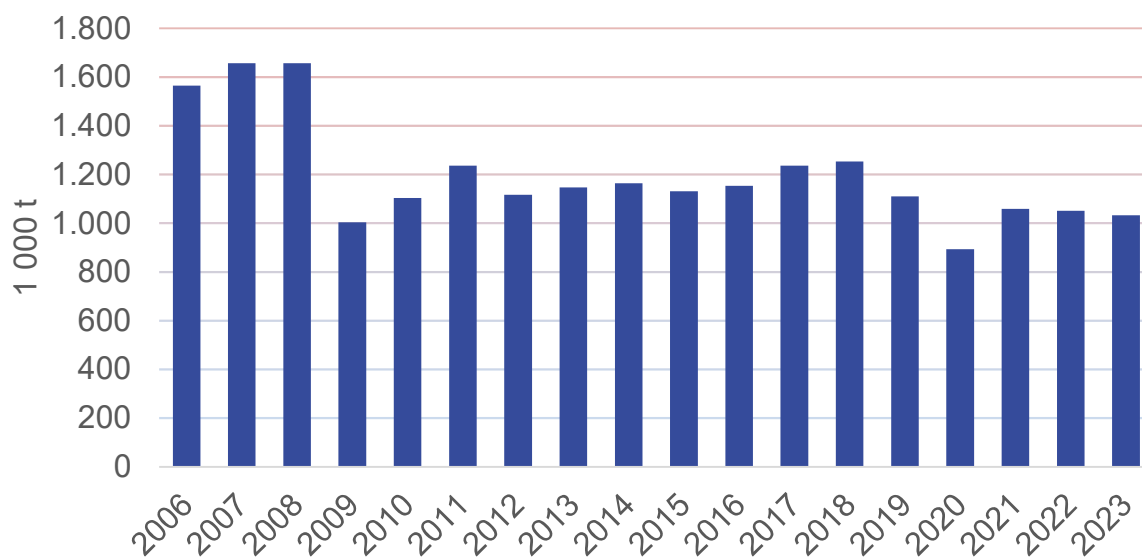
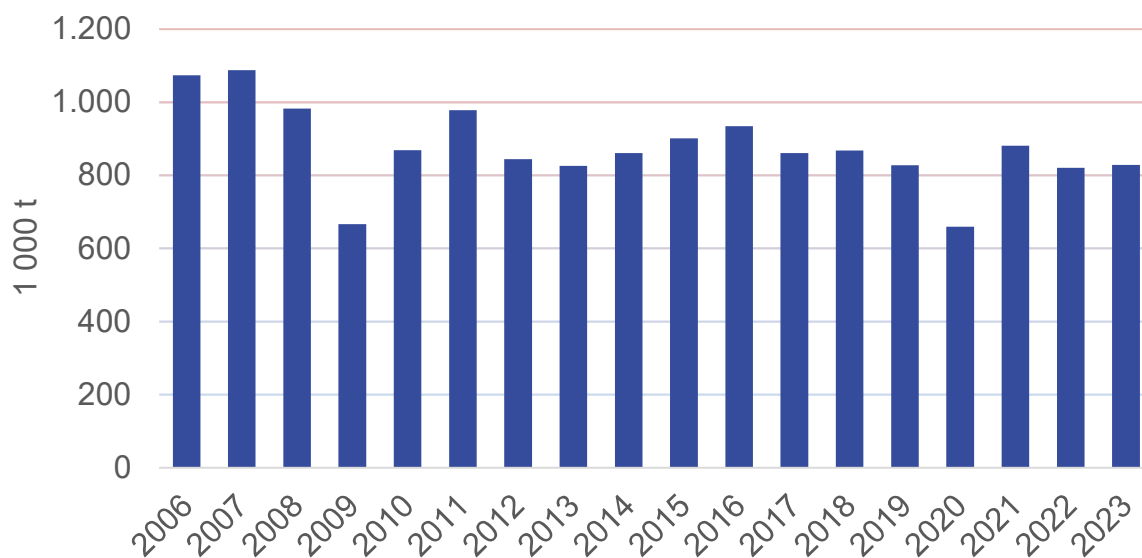


Figure 2: Italian Non-Ferrous Production (volume)





Poland's economic performance in 2023

Gross domestic product in 2023

Gross domestic product, in real terms was by 0.2% higher as compared to the previous year (in 2022 GDP growth amounted to 5.3%).

The dynamics of gross domestic product was negatively affected by domestic demand. The impact of consumption was negative, with a positive influence of investment demand.

Domestic demand was by 4.1% lower than in 2022 (then a growth of 5.2% was recorded). Final consumption expenditure decreased by 0.1%, of which in the household sector fell by 1.0% (against increases a year before). Gross fixed capital formation grew by 8.0%. The investment rate was 17.4% (against 16.8% in 2022).

Gross value added in the national economy was by 1.0% higher than in 2022. Its growth was recorded in construction – by 3.4%. Whereas, gross value added dropped in industry by 0.7% and in trade; repair of motor vehicles by 2.4%.

Macroeconomic indicators	2022	2023
GDP (yoy)	5,30%	0,20%
Consumer Price Index (yoy)	14,40%	11,40%
Unemployment rate (as of the end of the period)	5,2%	5,1%

Tab. 1. Macroeconomic indicators

Labour market in 2023

The number of employed in the national economy was similar to the one recorded at the end of 2022. The average paid employment in the enterprise sector in 2023 increased slightly as compared to the previous year. Registered unemployment rate at the end of 2023 was similar to the previous year's level and lower than in previous years. Average monthly gross wages and salaries in enterprise sector in 2023

- nominal +11.9% y/y
- real +0.5% y/y

The growth of average gross wages and salaries in the enterprise sector was still significant (although slightly smaller than in the previous year). With inflation weaker than in 2022 but still high, the purchasing power of wages and salaries increased slightly, after a decline a year ago.

Prices in 2023

The average annual price growth of consumer goods and services was smaller than in 2022 as well as than assumed in the Budget Act. Among others, the increase in prices of food and related to dwelling was weaker than in the previous year (but still high). The dynamics of transport-related prices slowed down significantly and, as a result, in 2023 they were similar to those recorded in 2022. The increase in prices of other groups of goods and services was usually higher than in the previous year. Inflation has gradually weakened since March; in December, the annual increase in prices amounted to 6.2%.

Sold production of industry in 2023

Following the significant growth in the two preceding years, sold production of industry decreased in annual terms. In units with more than 9 persons employed the decline of sold production was recorded in all sections of industry, including the largest one in mining and quarrying as well as in electricity, gas, steam and air conditioning supply. In manufacturing the scale of decline was similar to that of industry in total. Among the main industrial groupings sales decreased in the production of durable consumer goods, of intermediate goods and of energy, while they increased in the production of capital goods and, slightly, of non-durable consumer goods.

Construction and assembly production in 2023

Construction and assembly production increased to a lesser extent than in 2022. Among enterprises employing above 9 persons production increased in entities specializing in civil engineering as well as in specialized construction activities, while it decreased in units specializing in construction of buildings. Sales of investment works were much higher than in 2022, while sales of restoration works – dropped significantly.

Foundry industry in Poland in 2023

In Poland there are 449 foundries: 238 of non-ferrous metals, 176 of cast iron and 35 cast steel foundries. Majority of companies belong to the SME and they are responsible for over 40% of total production.

The economic downturn in Europe in 2023 caused serious problems for industries that are the main recipients of castings. Due to this fact, the main problems for Polish foundry industry were limited orders and short-term contracts.

Constantly rising minimum wage and the lack of workforce were additional problems faced by Polish foundry industry.

Total casting production in Poland in 2023 accounted for 754 078 tons incl. 492 486 tons of ferrous castings, which is 65,3% of total casting production. Production of nonferrous casting was on a level of 261 592 tons which represented 34,7% of total casting production. The production of castings in Poland in 2023 increased by 0,58% in comparison to 2022.

Main markets for Polish castings

In terms of branches, the main recipients of Polish castings were: automotive industry (65%), construction (9%), machinery industry (9%), iron and steel industry (7%), energy industry (3%) and others (7%).

Employment

Employment in the Polish foundry industry for years has remained at an almost unchanged level for years, which was 22.000 employees. Due to the fact of closure of few foundries in 2023, a slight decrease in the number of people employed in the foundry industry was observed.

Export of castings

In 2023, like in previous years, export of castings accounted for nearly 50% of total production: iron castings - 55%, non-ferrous metal castings - 43% and steel castings 40%. The main recipients of Polish castings are located in UE and USA.

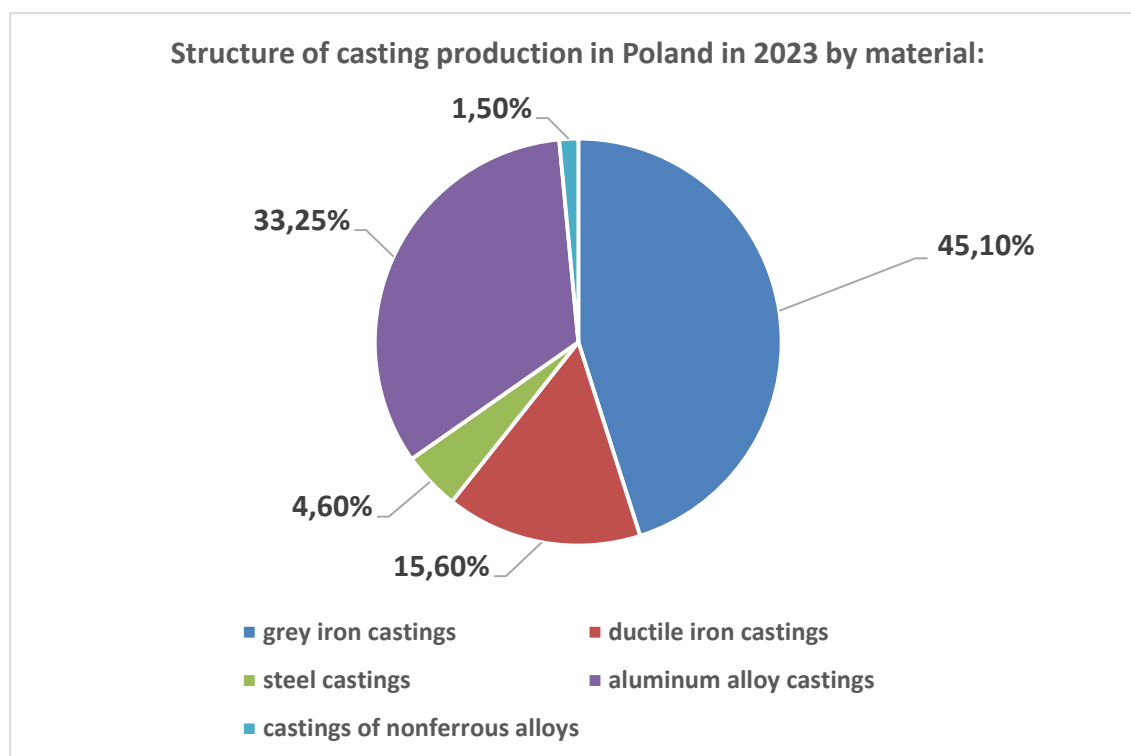


Fig. 1. Structure of casting production in Poland in 2023 by material

Ferrous alloys casting

Material / year (in t.)	2022	2023
Grey iron castings	335 540	339 540
Ductile iron castings	114 886	117 886
Steel castings	37 060	35 060
Total ferrous alloy castings	485 486	492 486

Tab. 2. Ferrous alloys castings production in Poland in 2022 and 2023

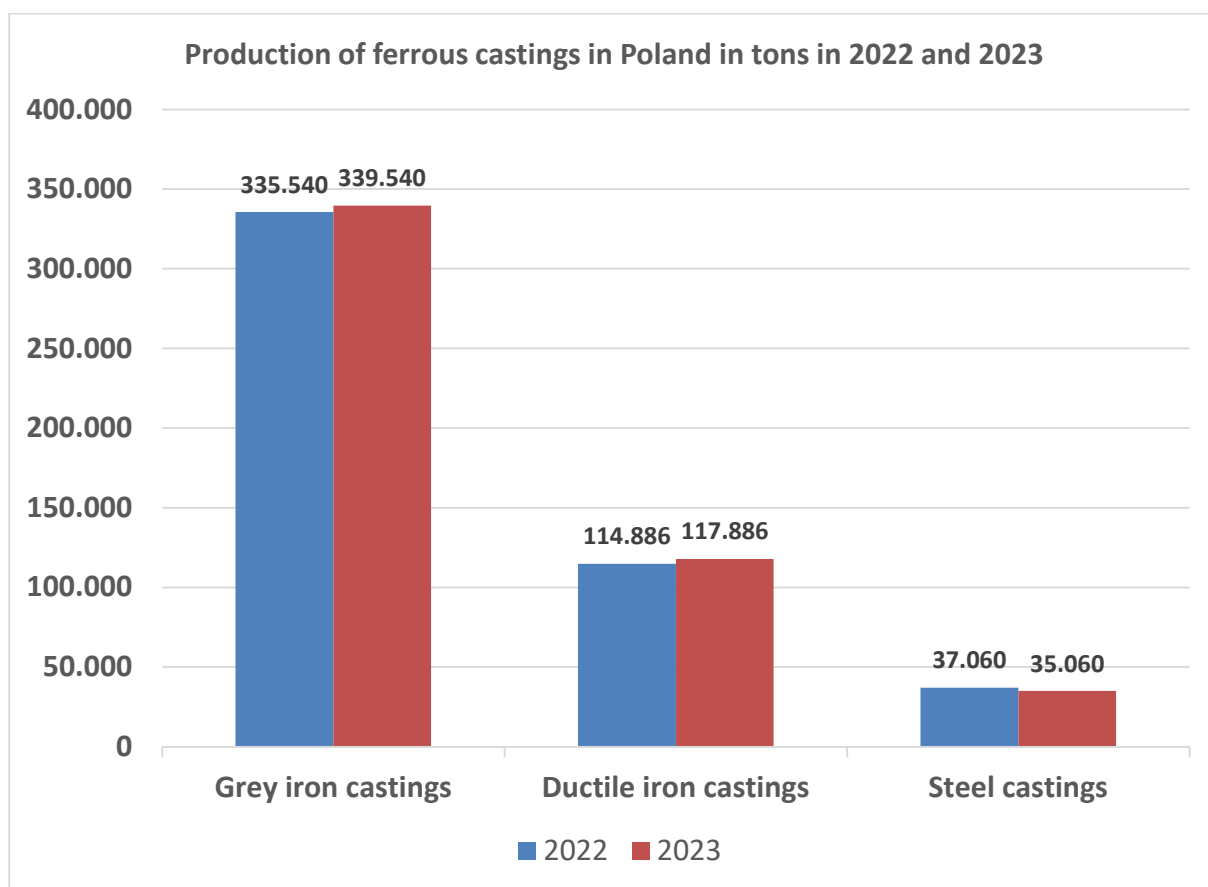


Fig. 2. Production of ferrous castings in Poland in tons in 2022 and 2023

Nonferrous alloys castings

Material / year (in t.)	2022	2023
Copper alloy castings	4448	4442
Aluminium alloy castings	252 008	250 000
Zinc alloy castings	5 559	5 050
Other nonferrous alloy castings	2 224	2 100
Total nonferrous alloy castings	264 239	261 592

Tab 3. Non ferrous castings production in Poland in 2022 and 2023

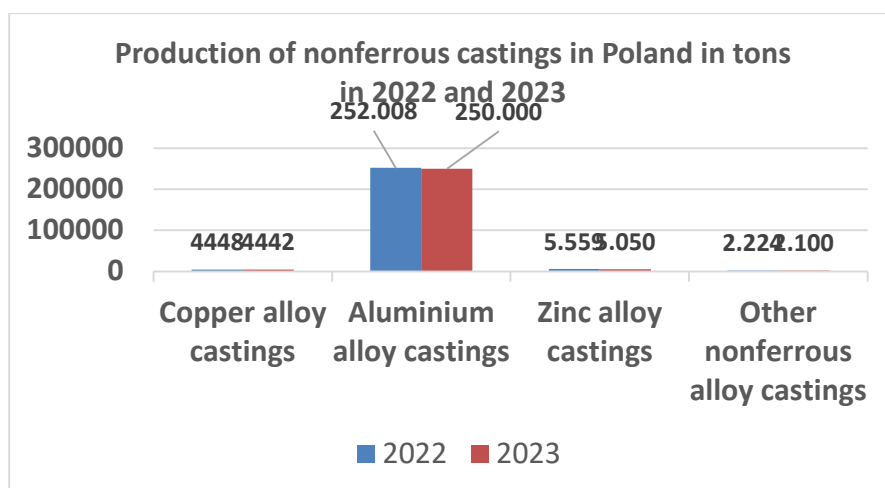


Fig. 3. Production of nonferrous castings in Poland in tons in 2022 and 2023

	2022	2023
Total ferrous and nonferrous castings	749 725 t	754 078 t

Tab. 4. Total ferrous and nonferrous castings production in Poland in 2022 and 2023

Sources: GUS – Central Statistical Office, Polish Foundry Chamber of Commerce - own research.



Figure 1: Polish Ferrous Casting Production (volume)

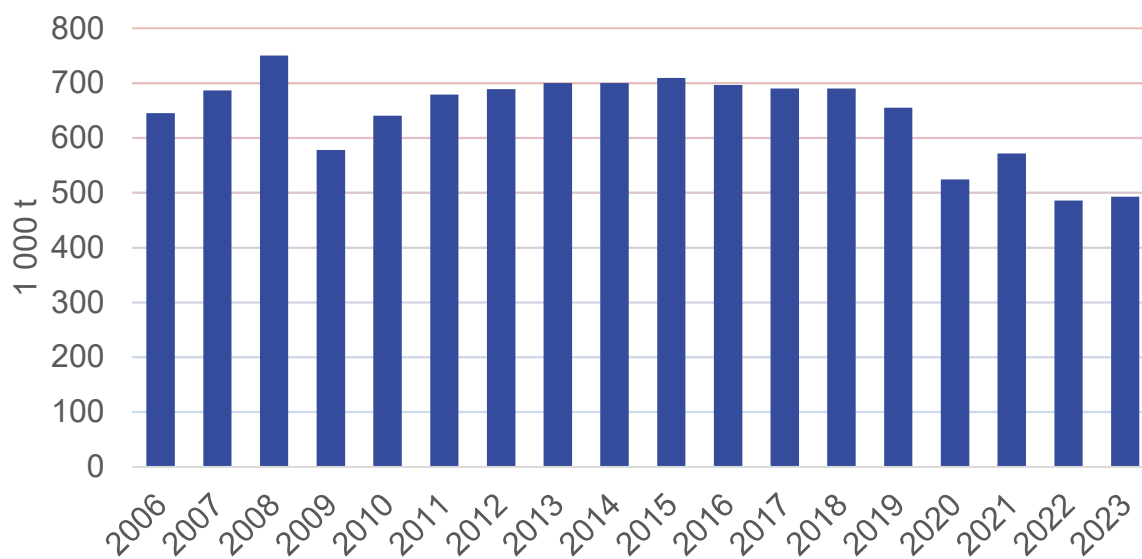
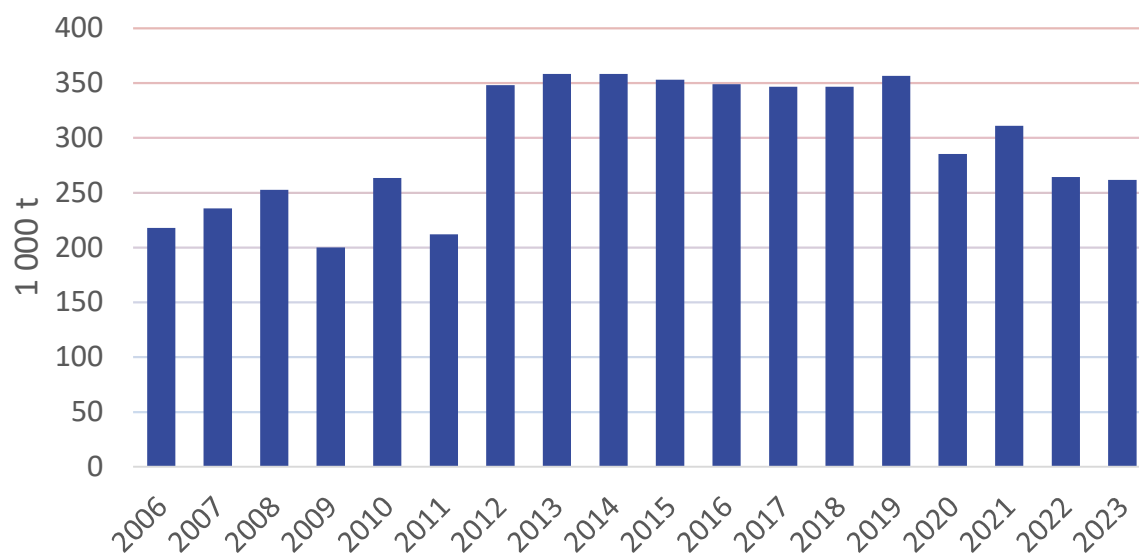


Figure 2: Polish Non-Ferrous Casting Production (volume)





General Economic Situation

According to the latest results of the INE (National Statistical Institute) in 2023, Gross Domestic Product (GDP) registered an increase of 2.3%.

In 2023, exports and imports of goods decreased by 22.2% and 27.6%, respectively, compared to increase of 23.2% in exports and 31.7% in imports, recorded in 2022.

In 2023, exports and imports of services grew 15.8% and 3.4% in relation to the previous year, respectively.

The employment situation

In 2023, the active population in Portugal amounted to 5 325.2 thousand people and the employed population was estimated at 4978.5 thousand people. The unemployment rate reached in 2022, 6.5% of the active population.

In the foundry area, the demand for skilled technicians, operators and maintenance staff has been increasing every year. Companies have difficulties in attracting talent and keeping it in their organisations.

Foundry Industry

The automotive industry remains the main customer market, which absorbs about 71% of the Portuguese global production of foundry products.

The Portuguese foundry sector exports 85% of the total production (by weight) mainly to the European market.

Production

In 2023, the outcome of the Portuguese foundry industry was roughly 170 thousand tons, 121 thousand tons from the ferrous sector and 49 thousand tons from the non-ferrous sector. Which means an increase of 5.8% for the ferrous sector and a decrease of 4.5% for non-ferrous sector.

	2022		2023		2023/2022
	Ton.	%	Ton.	%	%
Ferrous	114 348	69	121 001	71	5.8
Non Ferrous	51 503	31	49 180	29	-4.5
TOTAL	165 851	100	170 181	100	2.6

In 2023, sales grew 10.4% for ferrous and decrease 5.4% for non-ferrous, which means an average increase of 1.2% compared to the previous year.

	2022	2023	2023/2022
	K€		%
Ferrous	267 090.03	295 342.88	10.4
Non Ferrous	376 223.77	355 747.41	-5.4
TOTAL	643 313.80	651 090.29	1.2

Ferrous Production

The following table shows the values for the ferrous sector, where we can see a decrease in nodular and steel subsector and an increase in iron subsector.

Ferrous	2022		2023		2023/2022
	Ton.	%	Ton.	%	%
Iron Castings	35 277	31	37 347	31	5.9
Nodular Iron	73 699	64	78 567	65	-6.6
Steel	5 372	5	5087	4	-5.3
TOTAL	114348	100	121 001	100	5.8

Iron foundries had a production increase of 5.9%. Steel and Nodular foundries had a decrease of 5.3% and 6.6% in their production, which was reflected in a global increase in the ferrous sector of 5.8% against 2022.

Non-Ferrous casting Production

The following table shows the values for the non-ferrous sector, where we can see a decrease in all the subsectors.

Non-Ferrous	2022		2023		2023/2022
	Ton.	%	Ton.	%	%
Light castings	34 859	68	33 673	68	-3.4
Copper	14 225	28	13 496	27	-5.1
Zinc	2 419	5	2011	4	-16.9
TOTAL	51 503	100	49 180	100	-4.5

Light castings foundries had a production decrease of 3.4%. Copper and Zinc foundries had a decrease of 5.1% and 16.8% in their production, which was reflected in a global decrease in the non-ferrous sector of 4.5% against 2022.

New casting plants and investments

In 2023, no new foundries were installed in Portugal, although there were several investments in existing foundries, aiming at process improvement.

Global investments in the non-ferrous sector during 2023 were around 15 M€, mainly in aluminium foundries. In 2024, investments are estimated to reach the amount of 13 M€.

Overall investments in the ferrous sector in 2023 were around 15M€, carried out mainly by iron foundries. In 2024, planned investments are expected to reach a total amount of 14M€.

Industrial Cost

Raw materials - raw material prices gradually decreased during 2023.

Energy - Electricity market prices in 2023 return to 2021 levels thanks to falling gas prices and the boost in renewable energy.

In 2023, annual electricity market prices fell to levels similar to those in 2021, mostly below €100/MWh. The fall in gas prices, combined with the reduction in demand and the increase in renewable generation compared to 2022, led to a decrease in prices in the electricity markets. During 2023, installed solar and wind energy increased in most markets, thus favouring the increase in production with these technologies. In Portugal, solar energy production recorded a year-on-year increase of 41%.

Incoming orders

Globally, the needs of the automotive sector had an increase in 2023. This increase was reflected in the ferrous sector, where there was an increase in production output for this sector from 114 348 Ton in 2022 to 121 001 Ton in 2023. This increase was also reflected in billing values, in which there was also a good increase, from M€267 in 2022 to M€295 in 2023.

Foundry vocational training

The Portuguese Foundry Industry has its own Professional Training Centre, CINFU, in a partnership between APF - Portuguese Foundry Association and the Institute for Employment and Professional Training. CINFU promotes professional training for the workers of the sector and for those who will join it in the future. There is also a long partnership with the University of Porto - Faculty of Engineering, for the training of future foundry engineers.

Figure 1: Portuguese Ferrous Casting Production (volume)

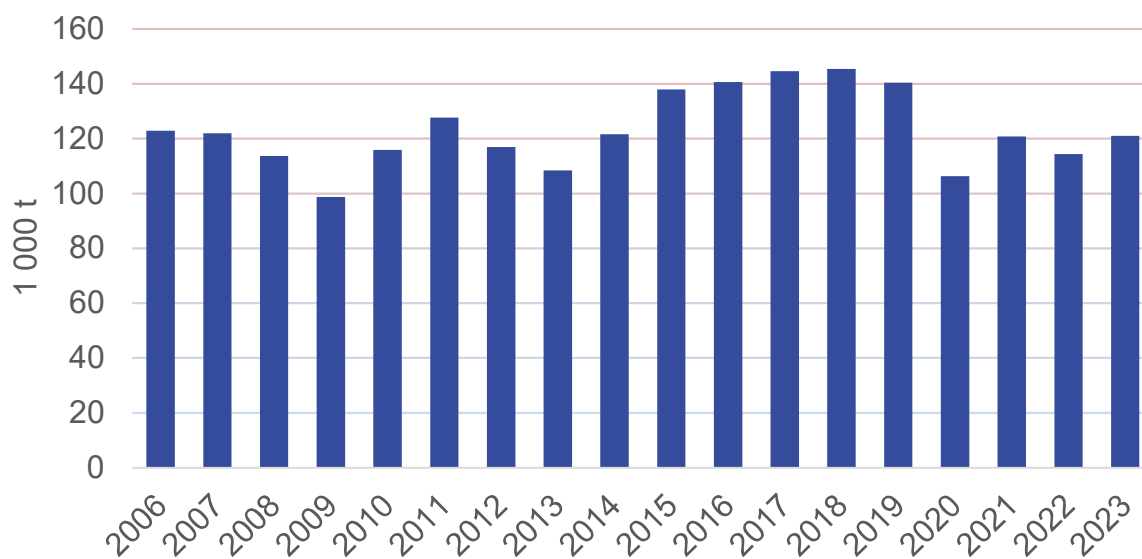
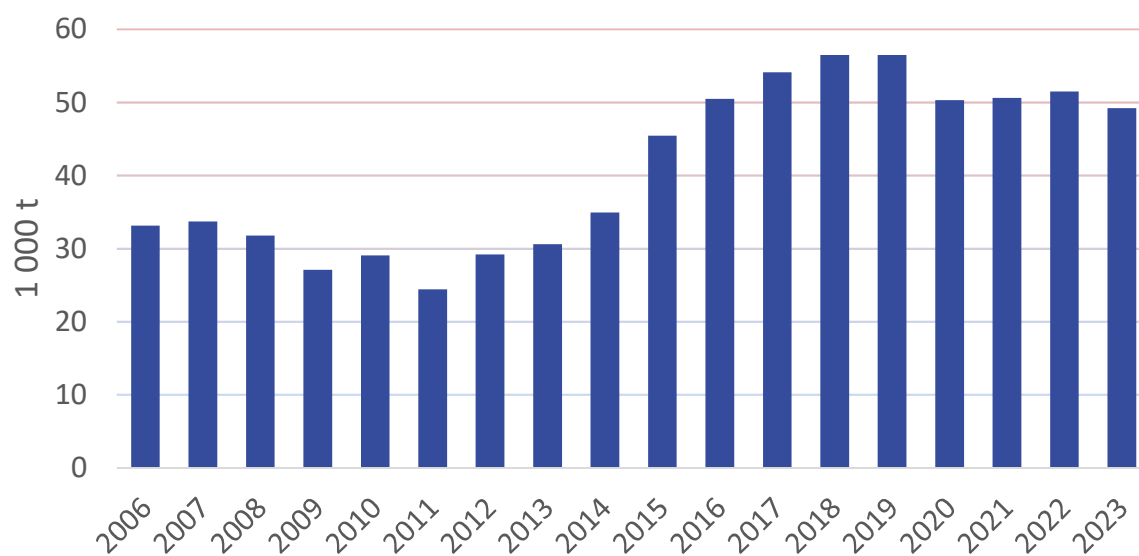


Figure 2: Portuguese Non-Ferrous Casting Production (volume)





Spring Forecast of Economic Trends 2024 for Slovenia

Economic growth will pick up this year (2.4%), albeit somewhat more modestly than we forecast in the autumn (2.8%). Economic activity will benefit from continued investment growth, easing of inflationary pressure and a recovery in foreign demand, although this will be somewhat weaker than expected in the autumn. We expect a recovery in goods exports after last year's decline and slightly higher growth in value added in manufacturing, while growth in services exports will be driven mainly by growth in tourism-related services. Growth in the export sector will be restricted by further deterioration in competitiveness as a result of increased domestic cost pressure, particularly in terms of labor costs. We expect investment to continue to grow (4.2%), driven by continued strong government investment activity, which is also linked to the recovery from the floods and the implementation of the Recovery and Resilience Plan, robust growth in housing investment, and a resumption of growth in investment in equipment and machinery as exports recover. Private consumption is expected to rise by 1.6% as real income and employment increase. Private consumption growth will be supported by high employment levels, sustained wage growth, lower price pressures and increasing consumer optimism. The relatively modest acceleration in growth compared to last year is largely methodological and related to the abolition of supplementary health insurance and its transformation into a compulsory healthcare contribution. However, this change will boost the growth of government consumption, which will rise to 6.8% this year.

In the next two years, GDP growth is expected to be slightly higher (2.5% in 2025 and 2.6% in 2026). Higher growth in exports (3.2% in 2025 and 4.2% in 2026) and related activities will follow higher growth in foreign demand. Exports of high-technology industries (pharmaceuticals, ICT equipment) in particular are expected to increase and their contribution to value-added growth in manufacturing will strengthen. Structural changes in the European industrial sector will lead to more modest growth in the Slovenian automotive sector, i.e. in the manufacture of motor vehicles and some related activities. Private investments in equipment and machinery will recover with higher exports. The investment activity of the general government sector will continue to be high, but we expect somewhat lower growth in housing investments. Growth in private consumption will accelerate to around 2% in the wake of further real income growth and expected slightly lower saving rate, which will nevertheless remain higher than before the epidemic. Higher spending on non-essential goods and services (furniture, electronics, tourism, etc.) will contribute to turnover growth in trade, accommodation and food service activities, and creative, arts, entertainment, personal and sports activities. After being temporarily high in 2024, growth in government consumption will be moderate again in 2025 (around 2%), mainly due to further growth in employment and healthcare expenditure and the gradual implementation of a long-term care system. In 2026, the full implementation of the Long-Term Care Act will lead to a slight rebound in government consumption growth.

The increase in employment and the decline in unemployment will weaken further this year; employment growth will also be limited in the coming years by the labor shortage in connection with demographic developments. Despite the higher projected economic growth, employment growth will average 0.7% this year (1.2% last year) and the average number of registered unemployed will be similar to last year. Employment will not increase significantly in the next two years, though the labor shortage will be somewhat alleviated by certain measures to facilitate the attraction and recruitment of foreign workers, which should be further strengthened. As last year, employment growth will mainly come from the recruitment of foreigners.

The average gross wage will rise by 6.9% in nominal terms this year (by 4.1% in real terms); real growth will gradually weaken towards the end of the forecast horizon. Wage growth in the private sector will remain relatively high this year (7.5% in nominal terms). This will be due to the continued labor market pressures in the face of labor shortages and increased pressures to maintain purchasing power and the

January increase in the minimum wage (by 4.2%). In the public sector, wage growth (5.8% in nominal terms), which will be significantly lower than last year, will be affected by the partial adjustment of wages for inflation in the middle of the year. Overall, wage growth will weaken over the next two years. This reflects the easing of price pressures and companies' efforts to improve their cost competitiveness, which has weakened considerably in recent years. The forecast of gross wage growth is subject to considerable risks, particularly in connection with the possible persistence of inflation, increased labor market pressure due to supply bottlenecks and the implementation of the wage system reform in the public sector.

Inflation is expected to gradually decline for most of this year before rising again towards the end of the year and the beginning of next year due to the base effect and the expiry of measures to curb high energy prices; we estimate that it will approach 2% in 2026. For 2024, we expect a further slowdown in the growth of services prices, which will remain relatively high amid continued consumption growth. The growth of food prices will also continue to slow. The rise in non-energy industrial goods prices will be moderate. Assuming that energy prices on the global market are relatively stable, the year-on-year growth in energy prices in the consumer price index will fluctuate considerably due to the expiry of the temporary measures to mitigate the consequences of rising energy prices. Larger effects are expected in 2025 in particular, when the reintroduction of RES and CHP contributions is taken into account. The measure to regulate electricity prices will expire at the end of 2024, but, given the stabilization of the situation on the energy market, it is unlikely to contribute to inflation. Taking into account the expiry of the above-mentioned measures, average inflation is therefore expected to fall to 2.7% this year and rise to 3.4% in 2025, although price increases for most groups of goods and services will slow. Inflation is expected to fall to 2.2% in 2026.

The realization of the Spring Forecast is subject to a number of uncertainties due to the geopolitical and international economic situation, which may affect the pace of the expected recovery and the moderation of inflation in Slovenia's trading partners. The domestic economic environment is also subject to uncertainties related to the impact of deteriorating competitiveness on the export-oriented part of the economy, the country's capacity to sustain high levels of investment in the coming years and the incomplete planning of certain reform measures; there are, however, also some upside risks to the baseline scenario. Geopolitical uncertainties could slow the economic recovery in Slovenia's main trading partners more than projected in the baseline scenario this year. In particular, an escalation of the situation in the Middle East and in Ukraine could lead to renewed supply shocks, which would also have a negative impact on the export-oriented part of the Slovenian economy. In addition, the latter could also be affected by possible increased cost pressures, which would worsen its already weakened competitiveness. Uncertainties and risks in the euro area and in Slovenia are also related to the possible persistence of inflation, which could further constrain household purchasing power and lead to a stronger tightening of monetary policy or the persistence of elevated interest rates, with negative effects on economic activity and financial stability. The broader economic consequences of last year's floods also remain uncertain, particularly with regard to the pace of reconstruction after the floods due to limited administrative and personnel capacities, including in the construction sector. There are, however, also some upside risks to the economic growth forecast. These arise in particular from a possible faster decline in inflation, more successful attraction of workforce and more efficient absorption of EU funds in conjunction with reform measures.

The Slovenian Foundry Industry in 2022 and 2023

Overall production of the Slovenian foundry industry (in tons)

The total production of the Slovenian foundry industry in 2023 was 168.253 tons, which is a decrease of 6% compared to the 178.500 tons in 2022. Changing market conditions (decreasing demand or fewer orders), market restructuring and high energy prices, to which some companies had to adapt, were the main reasons for the decrease in production. In general, all branches of the foundry industry experienced a decline in production, with the exception of aluminum alloy foundries and the steel casting branch of industry.

Production of the Slovenian foundry industry in 2023 by metal (in tons):

- The production of grey cast iron amounted to 59.019 tons, which is 11% less than last year,
- The production of ductile iron amounted to 36.614 tons, which is 7% less than last year,
- The production of malleable iron totaled 2.700 tons, which is down by 4% from last year,
- The production of copper alloys totaled 1.050 tons, which is down by 7% from last year,
- The production of zinc alloys totaled 5.073 tons, which is less than 29%, by last year.
- The production of aluminum alloys is slightly higher than last year by 4%, which numbers to 57.912 tons produced in the year 2023,
- Finally, the production of steel is higher than last year by 37%, numbering 5.885 tons in 2023.

There are no other castings in 2023, which also corresponds to last year's information, including Mg-alloys, which are not cast in Slovenia.

FOUNDRY PRODUCTION IN SLOVENIA IN 2023 (in tons)										
Year	Grey iron	Ductile iron	Malleable iron	Steel	Cu-alloys	Al-alloys	Mg-alloys	Zinc	Other casting production	Total production of casting
2022	65.860	39.172	2.800	4.269	1.125	55.576	0	7.103	2595	178.500
2023	59.019	36.614	2.700	5.885	1.050	57.912	0	5.073	0	168.253
INDEX • 2023/2022	0.89	0.93	0.96	1.37	0.93	1.04	0	0.71	0	0.94

Figure 1: Foundry production in Slovenia in 2023 (in tons), Slovenian Foundrymen Society 2023

Production value of the Slovenian foundry industry (in €)

The total production value of the Slovenian foundry industry in 2023 amounted to 1.035.562.987, which is an increase 1,6% compared to last year's 1.018.943.419 €. Export has also risen this year by 1,5%, from 82,4% in 2022 to 83,6% in 2023.

The production value of iron casting (grey iron, ductile iron, malleable iron) in 2023 amounts to 156.758.426 € which in comparison to last year's 170.122.439 € is a decrease by 7,9% and the export rate rising in 2023: 79,3% from last year's 77,9%. The production value of steel casting in 2023 was 41.019.073 €, which is a decrease by 10,4% from last year and the export in 2023 being 69,5%, which is a decrease from last year's 75,1%.

The complete value of light metal casting in 2022 was 729.952.690€ with the value this year growing by 4,4% which amounted to 761.814.300€. The export has grown as well, with the rate of export in 2023 being 87,1% from 85,8% in 2022. The casting of other non-ferrous metals in 2022 reached the value of 73.067.915 million EUR, this year the value is higher by 4%, amounting to 75.971.188€. It's export in 2023 was 63,7% in comparison to the export in 2022 being 63,3%.

PRODUCTION VALUE OF THE FOUNDRY INDUSTRY IN SLOVENIA IN 2023					
(in EUR)					
Year	Iron Casting (grey iron, ductile iron and malleable iron)	Steel	Light metals	Other non-ferrous metals	Total
2022	170.122.439	45.800.375	729.952.690	73.067.915	1.018.943.419
2023	156.758.426	41.019.073	761.814.300	75.971.188	1.035.562.987
INDEX					
• 2023/2022	92,1	89,6	104,4	104	101,6

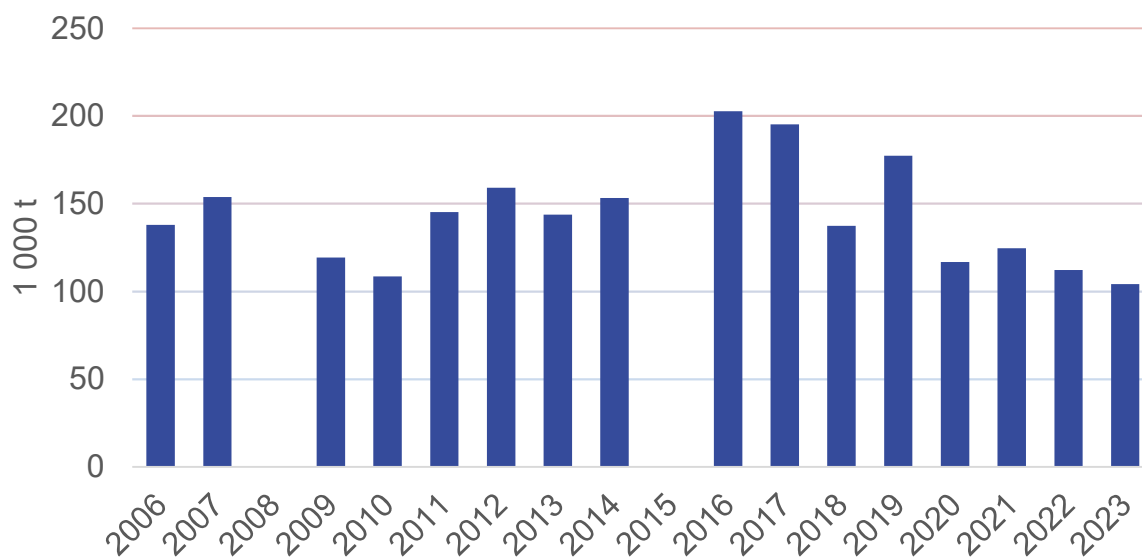
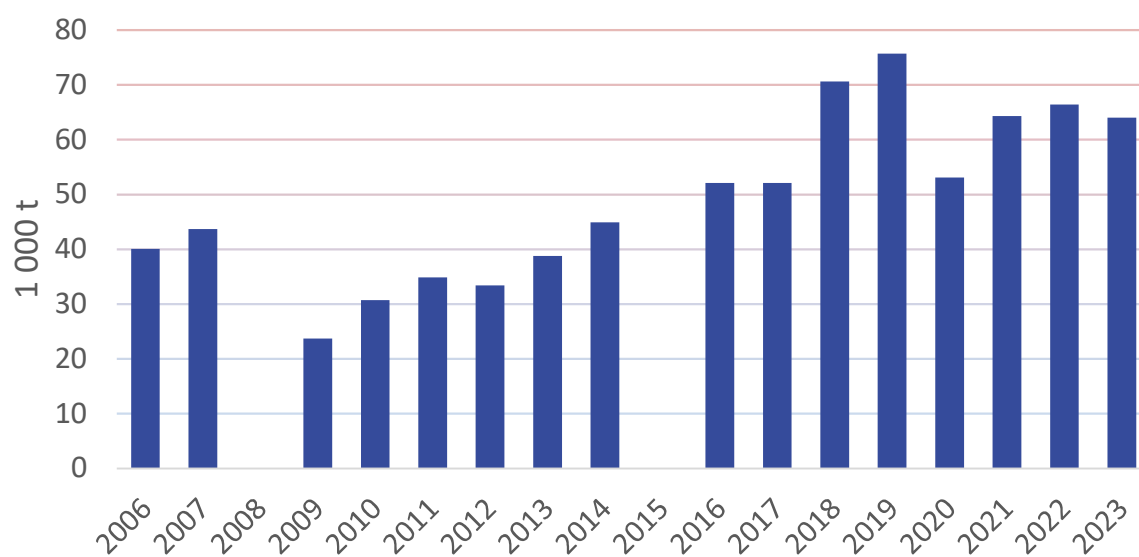
Figure 2: Production value of the Slovenian Foundry industry in 2023 [€], Database of the Chamber of Commerce and Industry of Slovenia

EXPORT RATE OF THE FOUNDRY INDUSTRY IN SLOVENIA IN 2023					
(in %)					
Year	Iron Casting (grey iron, ductile iron and malleable iron)	Steel	Light metals	Other non-ferrous metals	Total
2022	77,9	75,1	85,8	63,3	82,4
2023	79,3	69,5	87,1	63,7	83,6
INDEX					
• 2023/2022	101,8	92,5	101,5	100,6	101,5

Figure 3: Export rate of the Slovenian foundry industry in 2023 [%], Database of the Chamber of Commerce and Industry of Slovenia

Sources:

IMAD – the Institute of Macroeconomic and Development
Chamber of Commerce and Industry of Slovenia, Association of Metals and Non-metals
Slovenian Foundrymen Society

Figure 1: Slovenian Ferrous Casting Production (volume)*Figure 2: Slovenian Non-Ferrous Casting Production (volume)*



The Economy in General and Industrial and Metal Sector in particular

Global GDP growth is projected to slow to 2.9% in 2024 from 3.1% in 2023, before recovering to 3% in 2025 (source European Commission). The IMF estimates slightly upward global economic growth in 2024 to 3.1%.

The headline level of global inflation is projected to decline from a 6.8% in 2023 (average year-on-year) to 5.8% in 2024 and 4.4% in 2025, broadly due to tight monetary policies and lower energy-related prices. However, regional conflicts in Gaza, the Red Sea or the current war in Ukraine, which could cause a supply crisis with the consequent escalation of food, energy and transport prices and the tightening of monetary policies, should be highlighted as a downside risk to the projections.

EU economic activity is projected to grow by 1.7% in 2024. The pace of growth is expected to stabilize from the second half of 2024 until the end of 2025.

Average Spanish GDP growth in 2023 was 2.5%. The European Commission estimates Spanish GDP growth in 2024 at 1.7%. The IMF is less optimistic and estimates Spanish GDP growth in 2024 at 1.5%.

Spanish inflation in 2023 recorded an average rate of 3.5%, compared to 8.5% in 2022. The slowdown in inflation will continue in 2024.

The annual average Spanish CPI stood at 3.5% in 2023.

Industrial Sector

In 2023, the year-to-date Industrial Production Index (IPI) recorded a year-on-year rate of change of -0.6% compared to 2.9% in the same period of 2022.

In 2023, the growth rate of industrial prices, excluding energy, was -1.1%. The Industrial Turnover Index average change was -1.2%, compared to the +22% rate recorded in the same period of the previous year.

Metal Situation

Industrial Metal production, as measured by the Metal Production Index (IPIMET), closed the year 2023 with a growth rate of 4.5% (3.4% in 2022) and the Metal Industry Turnover Index increased by 4% (up 13.6% in 2022).

On the other hand, the Industrial Price Index of the Metal Industry (IPRIMET) recorded an annual growth rate of -0.5% (11.1% in the same period last year). The evolution of the Industrial Prices in the month of December 2023 has been positive in all the branches of activity of the metal sector, except in the activity of metallurgy, manufacture of iron, steel and ferroalloy products and manufacture of metal products.

Exports of the Metal Sector, in the accumulated year 2023 have registered a rate of +10.6%, compared to the rate of +13.1% of the same period of the previous year. As for Metal imports, in the year 2023 they registered an increase of 5.2% compared to the rate of 24.5% of the year 2022. The difference between exports and imports in the accumulated year 2023 registers a deficit of -16,112 million (-21,860 in 2022), which means a reduction of 26.3% compared to the year before.

Labour Market

In year-on-year terms, Social Security enrolment rose by 523,537 persons. Social Security enrolment in annual terms slowed by 5 hundredths of a percentage point to 2.61%. Registered unemployment rose by 60,404 persons (-2.23%) to 2.77 million.

Metal Labour Market

In the average year 2023, employment in the metal industry has increased by 1.3% and stands at 1,043,950, which means an increase of 13,520 employees compared to those employed in 2022. This figure (quarterly increase in the last quarter of 2023) of employment is the highest figure since the first quarter of 2009.

In 2023 as a whole, compared to the annual averages, an unemployment rate of 3.6% is recorded.

Foundry Sector

The foundry sector is a key sector in those countries that are committed to industry as an engine of economic growth.

After a 2021 and 2022 year in which the Spanish foundry sector registered an increase in production, this 2023, due to these 3 materials increases, is the third year in a row in which the sector registers a production increase. +6.89% in 2021, +2.21% in 2022 and +2.44% in 2023.

Sector Situation Report elaborated by FEAf as of September 30th 2023, showed the following scenario. Comparing data of the common enterprises, 2022 vs 2023, the occupancy rate increased from 75% to 78%. The order book, from January to September 2023, it has been decreased from 86 to 68 days. As of September 2023, the evolution of the workforce had increased by +1.25%. and prospects for the first half of 2024 were to decrease a bit or almost maintain (-0.12% in June 2024).

Sectors such as automotive have performed reasonably well in 2023, while manual moulding, in general, and sectors such as wind power, in particular, have fallen in production by percentages of around 10%.

While for the overall business situation at the end of 2023, 77% of companies consider the situation to be normal and 23% of companies consider it to be serious.

Looking ahead to the year 2024, there is a lot of uncertainty in the foundry sector due to some important issues such as: the global geopolitical situation, guaranteed supply and cost of raw materials, the evolution of energy costs, as well as the slowdown or decline in many countries around us.

Also of concern are the increases in labour costs and absenteeism figures in industry in general and in the foundry industry in particular.

With regard to the different client sectors, there is uncertainty in the different client sectors, also in the automotive sector and there is concern in some sectors such as the wind energy sector.

FEAF and all its companies will continue to work intensively in the fields of talent, R&D, energy efficiency, occupational risk prevention, sustainability and decarbonization in the sector. It will be absolutely necessary that at European level we protect ourselves from other competing countries that do not have the same legislation and we will continue to work to dignify and strengthen the work of the foundry, a basic sector of the industry and key to other industrial sectors of great importance in advanced economies.

Iron Casting Section. Automotive Casting

Automotive has held up well in 2023, better in serialized parts than in other segments, but the balance is positive. Stability is expected in 2024, or in any case, a slight decline. There has been no decline in the truck sector in 2023.

The market forecast, both domestically and internationally, is better as of June 2024 than in December 2023.

In Europe, there is concern and uncertainty for the future. There is a widespread labor problem in all companies, as well as absenteeism.

Customers are beginning to request aspects of clean energy, CO2 emissions, and carbon footprint in bids. It is very challenging to find and retain talent.

Iron Casting Section. Manual Molding and Mechanical Molding

The occupancy rate for manual molding foundries in this last quarter of 2023 has been 72% and for mechanical molding foundries the 74%.

Machine tool sector has performed well during 2023, with a significant increase, contrary to previous years which were quite bad. Regarding automotive sector, there has been a decrease in production. In the same way, the wind power sector fell by almost 10% in 2023.

On the other hand, 2023 has been a good year for die cutting sector, but it is expected to be a mirage.

Stainless Steel

In stainless steel sector, the naval and desalination sectors have grown during 2023 and have good forecasts for 2024. In contrast, Oil & Gas sector, chemical sector, and pharmaceuticals have decreased. The naval sector has performed better than the rest.

There is a general comment among the foundries that work with this material, they have personnel recruitment problems.

Steel Castings. Carbon and alloy steels

The second half of 2023 has been more challenging. In general, there have been declines in all sectors, except for railway and oil extraction.

Non-Ferrous

Aluminium foundries have produced more than in 2022, there has been an increase of +5.2% regarding production volume. However, for the Zamak a decrease of -5.8% is recorded.

International markets have performed better for the two materials. The international market for aluminium has performed better than the domestic market, as exports have increased by +7.2%.

Raw Materials prices and Auxiliaries in 2023

Scrap prices ended 2023 with prices lower than those at the end of the previous year. On average, most of raw materials used in the foundry sector, except FeMo, has had a downward evolution, in some cases a reduction of more than -20%. The scrap has had an aggregate decrease of -11.29% on the Spanish market.

Pig iron ingot prices have evolved downwards too, being at the end of 2023 well lower than those of December a year earlier, and recorded -22.12% on average of the year. In the case of nodular iron, the price was decreased from December 2022 to December 2023 too, a decrease of -37.34% was recorded, which means -28.42% on average of the year 2023.

It must be highlighted the high downward trend in all ferroalloys except FeMo(average 2023 vs 2022): FeSi Stone: -41.61%, FeSiMg (5-7%): -7.75%, FeMn Stone (6-8%): -25.26%, FeCr (0.05% C): -42.01%, FeMo: +25.26%, electrolytic Ni:-20.73%, Aluminium AC-46500 (L-2630): -7.02%, Zamak 5: -12.96%.

Energy

Fortunately, during the whole 2023 year, Spanish electricity market prices has been lower than the average of the previous year. The Spanish electricity market (OMIE) has recorded an average decrease of -58.30% compared to average 2022. OMIE average price 2023: 87,43 €/MWh. The Spanish gas market (MIBGAS) has had a decrease of -60.38% compared to average 2022 (39.19 €/MWh vs 98.92€/MWh).

Regarding the energy situation at the end of 2023, the 54% of companies consider it a normal situation (7% in 2022), 43% of companies consider it serious (52% in 2022) and 3% of companies consider it very serious (41% in 2022).

Figure 1: Spanish Ferrous Casting Production (volume)

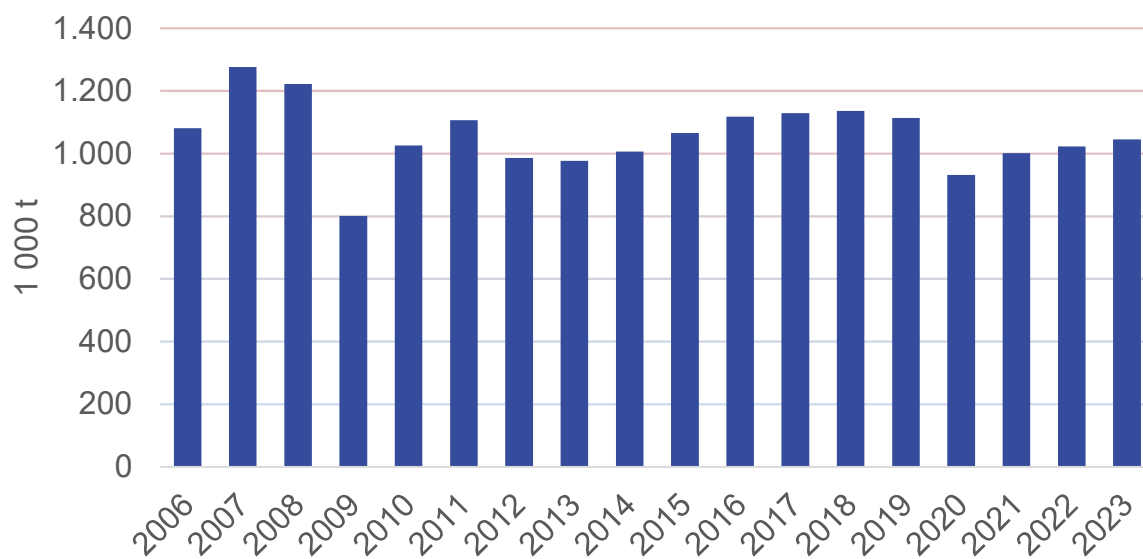
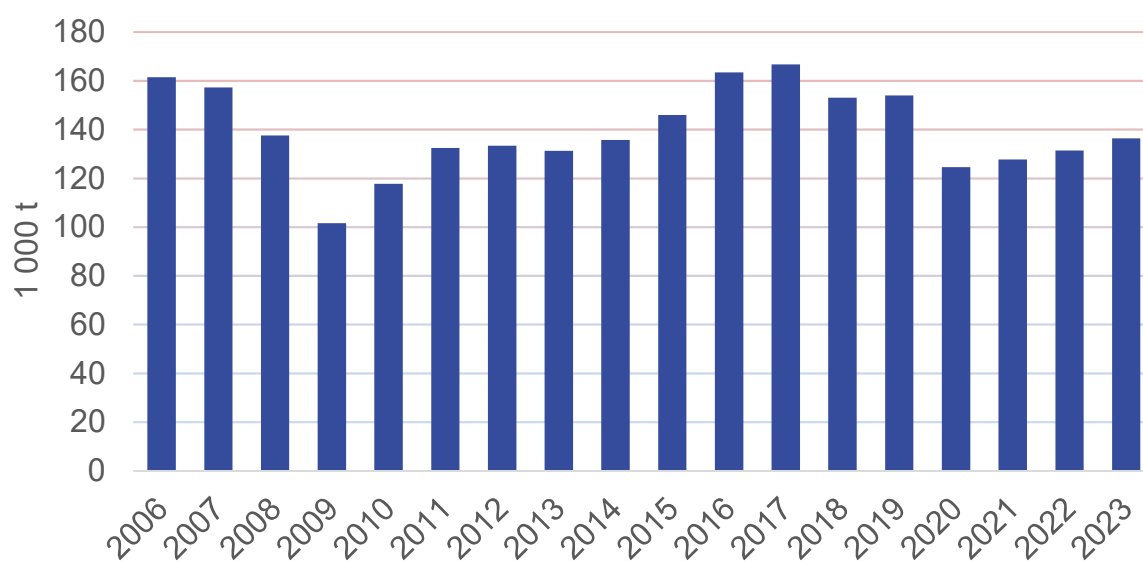
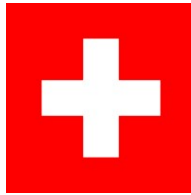


Figure 2: Spanish Non-Ferrous Casting Production (volume)





Situation of Foundry Industry

Innovative Swiss Foundries on a sustainable path – prospects for 2024 cautious

At the beginning of last year, the Swiss foundry industry experienced an encouraging upsurge, followed by a continuous slowdown. Overall, the number of tonnages delivered was 2.4% down on the previous year. The current year also looks challenging. The Swiss foundries remain cautiously optimistic in view of the growing demand for sustainable and innovative casting solutions. However, it is not until late 2024 at the earliest that the sectoral association is expecting an economic recovery on a lower level.

2023 went off to a partially flying start for the Swiss foundries. Thanks to the development of numerous new cast parts, along with the extraordinary expertise in the finishing of complex cast components, demand went up in many parts. In this way the Swiss foundries made a strong mark for the production site of Switzerland. In some of our affiliated firms the development departments faced huge demands because of the strong interest.

In the course of the year the positive trend was superseded by a gradual decrease in orders, which became apparent from last autumn on. Production of light metal and non-ferrous casting rose in 2023 by 1.1%, cast iron saw a reduction of 4.1%. Across all materials, total production volume was down by 2.4% at 40,000 tonnes delivered compared to 41,000 tons the previous year. In these results the economic slowdown is reflected in practically every user market of the Swiss foundry industry.

Last year proved to be challenging for suppliers to the automotive industry. A substantial reason for this was the following: in accordance with forecast market demand, Swiss die-casting companies focussed their investments on developing new product lines for electric drives and battery systems. However, in 2023 demand for battery-powered electric vehicles remained well below the planned volumes of European manufacturers.

Forecast for 2024

For the roughly 80% export-oriented Swiss foundry industry, prospects for the current year depend substantially on the economic development in important user markets like Germany and France. The strong Swiss franc is causing competitive drawbacks that cannot be offset in the short term and have severe setbacks for the export business. The earliest recovery on a low level is not expected until late 2024.

Nevertheless, in the longer term the Swiss foundry industry remains confident about the future. The persisting trends in climate protection and lightweight construction in individual mobility promote the increasing demand for sustainable and innovative casting solutions. The global mission to reduce environmentally harmful carbon dioxide emissions by using low-carbon energy sources encourages our industry to carry on investing in new cast parts for electric drives and battery systems. In addition, there are many innovations in sustainability in our affiliated firms. Some foundries, for instance, are into replacing crude oil with natural gas or even CO₂-neutral energy sources.

There are already concrete projects for using electricity to do so. Hydrogen is also being tested as a new energy source in the Swiss foundry industry. How innovative the sector is under way is also underlined by the fact that in many places production processes are also being increasingly digitised and employees are also being specially trained in IT security to this extent.

The Swiss foundries are dependent on well-trained skilled workers and managers for being able to reliably produce cast parts in highly automated processes. The lack of skilled workers therefore continues to represent a herculean task for the sector. A current worry for the Swiss foundries is also



the juggling act of being able, for instance, to pass on the high energy prices without straining good customer relations.

A compounding factor for the Swiss foundries is the impact of the major economic powers' interventionist policies. China, the USA and the EU are trying to be on a parity in subsidy competition so as to prevent companies moving out because of location disadvantages. Another element is that under the guise of the "European Green Deal" the EU is skewing the markets and therefore price structures. The Swiss foundries have only limited opportunities for competing in this contest. That is why the Swiss Foundry Association is continuing its dialogue with federal Bern to react to these distortions, be it through funding programmes for the energy-intensive industry or, for example, with an industry-wide electricity price.



Figure 1: Swiss Ferrous Casting Production (volume)

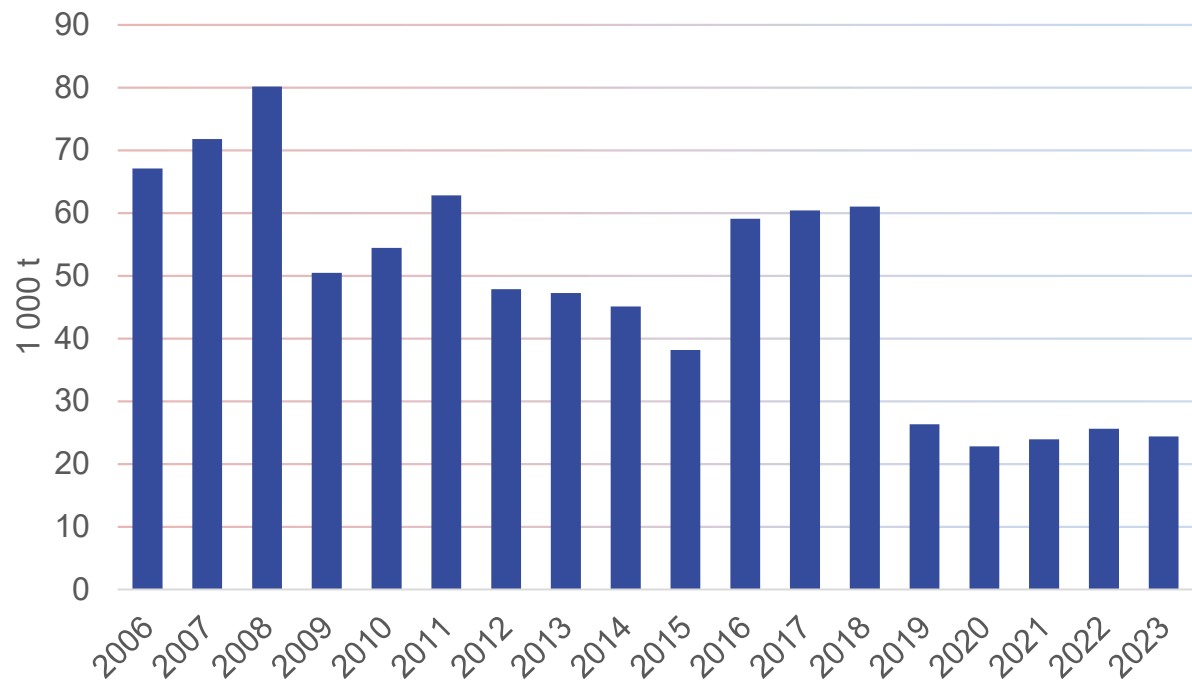
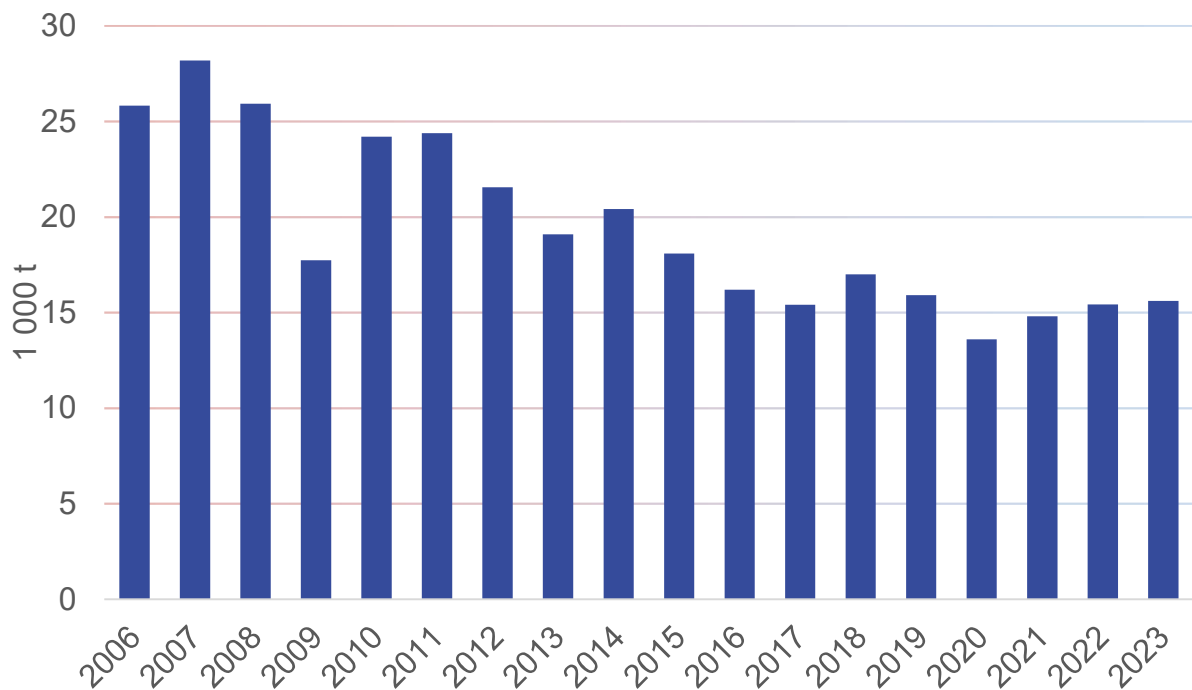


Figure 2: Swiss Non-Ferrous Casting Production (volume)



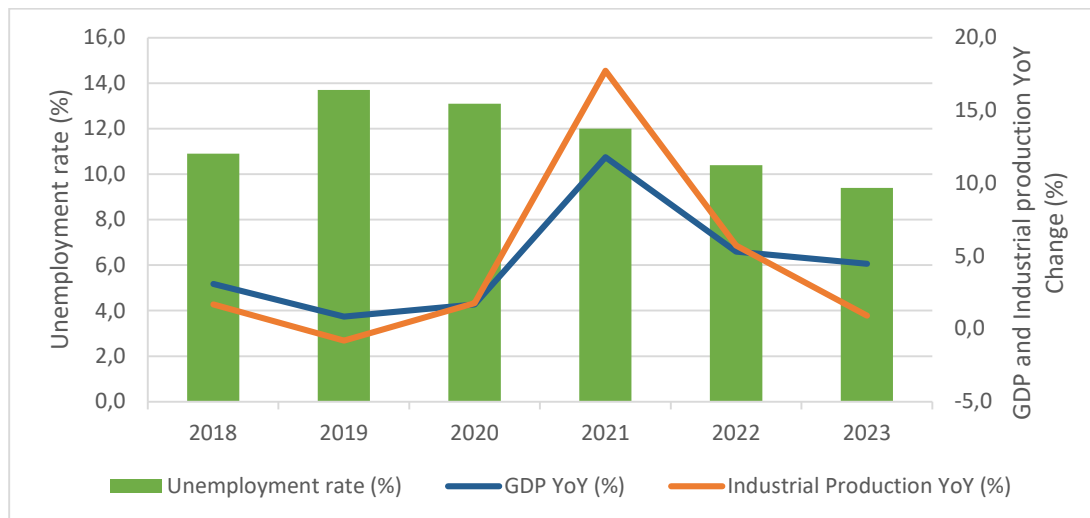


Macroeconomic Developments

In 2023, Türkiye's GDP expanded a 4.5%, fuelled mainly by robust increases in private consumption (12.8% in real terms), investment (8.9%), and government consumption (5.2%). Exports of goods and services decreased by 2.7%, imports increased by 11.7% compared to the previous year's chain-volume index in 2023. The earthquake and weak foreign demand contributed to the decline trend in the exports. Sector-wise, the service sector grew by 4.8% and construction by 7.8%, benefiting from earthquake recovery efforts. Throughout 2023, industrial production in Turkey faced significant challenges. The initial impact of earthquakes, coupled with weak global demand and volatile production trends, hindered sustained recovery. Despite strong overall economic growth driven by domestic demand and government policies, the industrial sector's contribution remained subdued.

Automotive market growth and investments in machinery and construction offered some support, but persistent imbalances and external pressures limited industrial growth. The challenging conditions in Turkey's manufacturing sector, which emerged in the second half of 2023 due to weakening demand, continued until the end of the year. Challenging market conditions both at home and abroad led to a slowdown in new orders and a decline in production.

Figure 1. GDP and Industrial Production Growth and Unemployment Rate



Source: Turkish Statistical Institute

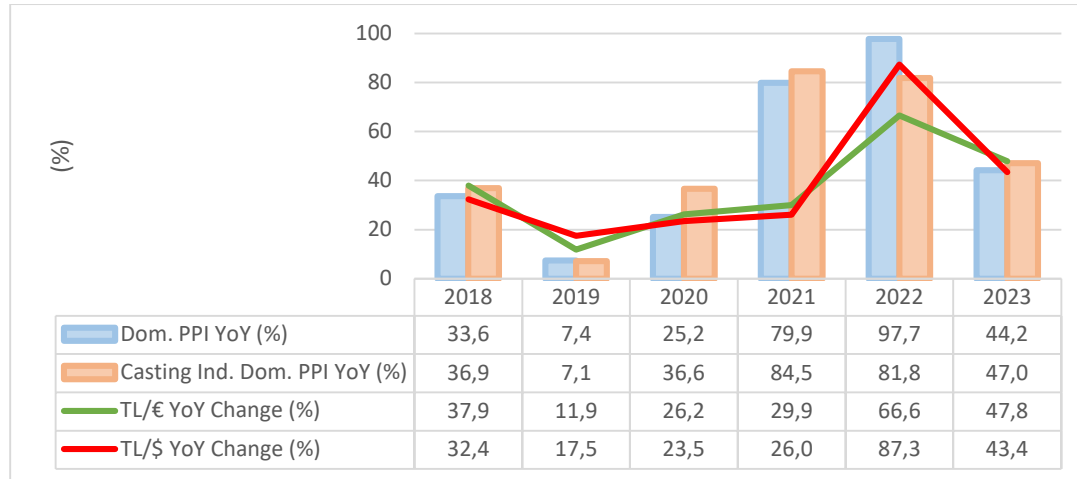
The depreciation of the lira, rising wages and rising raw material prices put upward pressure on input costs and this trend was also reflected in sales prices. On the other hand, firms' tendency to maintain the number of employees gave positive signals for labour markets. The labour market remained resilient, with a 9.1% unemployment rate in January 2024, despite the low labour force participation.

The current account deficit improved to \$ forty five point four billion in 2023 (4.2% of GDP) from \$ forty nine point one billion in 2022, notably in the latter half of the year. Inflation decreased from 57.7% in

January 2023 to 38.2% in June 2023. Still, it escalated to 68.5% by March 2024, driven by factors including the lira's depreciation, significant minimum wage hikes, tax adjustments, and strong demand.

The overall fiscal balance deteriorated to below -5% of GDP in 2023 (from -0.8 in 2022) due to rising expenditures and earthquake-related investment needs, and the primary balance was close to -3% of GDP (from +1.4 in 2022). However, the fiscal deficit is relatively low excluding earthquake-related expenditures. Public debt remains moderate at around 30% of GDP in 2023.

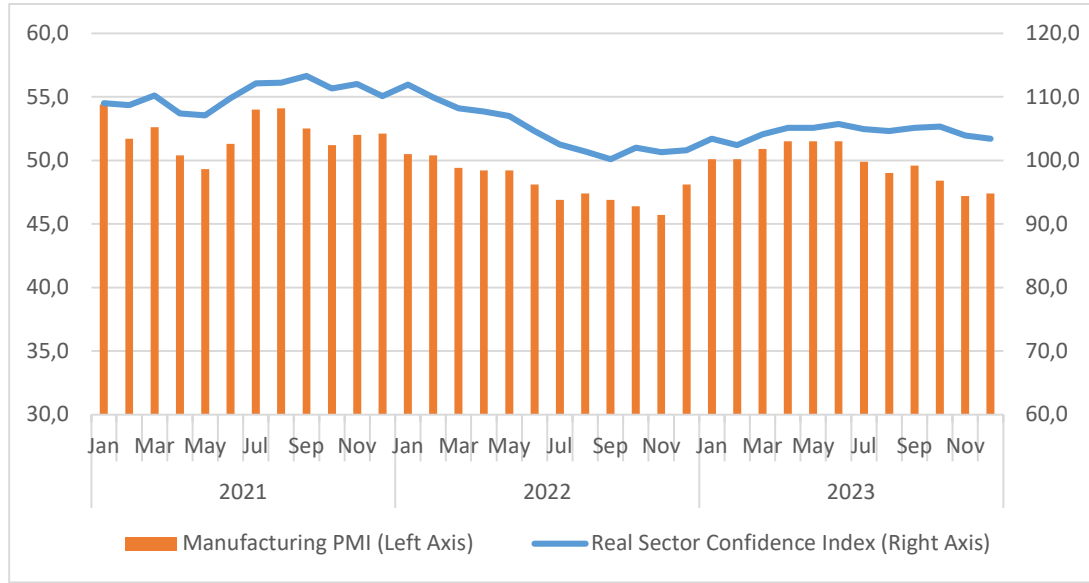
Figure 2. Producer Price Indices vs Currency Rates



Source: Turkish Statistical Institute

Looking ahead, economic growth is expected to slow to 3.5% in 2024, on the back of policy tightening and slower global growth, before picking up pace in subsequent years. Total investment will remain strong as earthquake-related reconstruction continues, and as an improved external environment helps restore export growth. Moreover, higher costs arising from further disruptions to transportation and trade could have sizable negative effects on the economy. In contrast, growth could be boosted further by a stronger influx of foreign investment due to possible improvements in fiscal, financial and monetary policy.

Figure 3. Manufacturing PMI and Confidence Index Evolution



Source: Turkish Statistical Institute, Istanbul Chamber of Industry Turkey Manufacturing PMI

The Situation In The Major Casting Customer Industries

According to 2023 data, Turkish total motor vehicle production increased by 9% to one million, four hundred sixty-eight thousand, three hundred ninety-three units. Passenger car production, which increased by 18%, reached nine hundred fifty-two thousand, six hundred sixty-seven. Together with tractor production, total production increased to one million, five hundred twenty-five thousand, nine hundred sixty-three units. In the commercial vehicle group, production in 2023 decreased by 5% and 7% in the light commercial vehicle group, while it increased by 16% in the heavy commercial vehicle group.

Compared to 2022, the commercial vehicle market increased by 35%, the heavy commercial vehicle market increased by 17% and the light commercial vehicle market increased by 39%. In the 12-month period of 2023, the total market increased by 55% compared to the same period of 2022 and finalized at one million, two hundred eighty-three thousand, nine hundred fifty-two units. During this period, the passenger car market also increased by 63% and reached nine hundred sixty-seven thousand, three hundred forty-one units.

In 2023, total automotive exports increased by 13% compared to the same period of 2022 and reached thirty-five point seven billion dollars. Exports of the main industry increased by 16% and exports of the supply industry increased by 10%.

According to the national general trade system, exports increased by 0.6% in the January-December period of 2023 compared to the same period of the previous year and reached two hundred fifty-five billion, seven hundred seventy-seven million dollars, while imports decreased by 0.5% to three hundred sixty-one billion, seven hundred seventy-four million dollars. In the January-December period, foreign trade deficit decreased by 3.2% from one hundred nine billion, five hundred forty-one million dollars to one hundred five billion, nine hundred ninety-seven million dollars. While the ratio of exports to imports was 69.9% in the January-December period of 2022, it increased to 70.7% in the same period of 2023.

In the January-December period, the share of manufacturing industry in exports by economic activities was 94.2%, the share of agriculture, forestry and fishing sector was 3.8%, and the share of mining and quarrying sector was 1.5%.

Germany ranked first in exports throughout the year. Exports to Germany were twenty-one billion, ninety-two million dollars, followed by the USA with fourteen billion, eight hundred twenty-six million dollars, Iraq with twelve billion, seven hundred eighty-six million dollars, the United Kingdom with twelve billion, four hundred sixty-eight million dollars, and Italy with twelve billion, three hundred eighty-one million dollars. Exports to the first five countries accounted for 28.8% of total exports.

According to the consolidated data of the Turkish machinery manufacturing industry, the sector increased its exports, including free zones, by 11 percent at the end of 2023 compared to the previous year and reached twenty-eight point one billion dollars. Exports to Germany, whose machinery imports remained flat throughout the year, increased by 7.6 percent to three point five billion dollars, while revenue from Russia, the second country with the highest exports, increased by 68.3 percent to nearly three billion dollars. Increases of up to 10 percent were achieved in the USA, Italy, and the United Kingdom, where machinery exports exceeded one billion dollars.

The three product groups with the highest exports were domestic and industrial refrigeration machinery, internal combustion engines and parts, and construction and mining machinery, while exports of machine tools increased by 15.3 percent and reached the threshold of one point five billion dollars. The sector's average export price per kilogram also increased from six point two dollars to seven point two dollars.

Based on the construction permits given by the municipalities in 2023, the number of buildings and dwelling units increased by 9.1% and 22.3%, respectively. The floor area of buildings also increased by 14.9%.

The growth in the annual production and domestic sales of the cement industry was 10.5% and 19%, respectively. On the contrary, Türkiye's cement export declined by 17.6%.

In 2023, Turkey's steel industry output was thirty-three point seven million tons, with a decline of 4% due to worldwide protectionist policies and tough competition in the domestic market. Compared to the previous year, steel exports decreased by 30% in volume and by 40.7% in USD value.

Turkey's total installed electricity capacity, which was approximately thirty-two gigawatts (GW) at the end of 2002, increased to one hundred six point seven GW by the end of 2023. Renewable energy power plants account for 62% of this increase in installed capacity. By the end of 2023, the share of renewable energy in total installed capacity increased to 55%. A total of two thousand eight hundred seventy-three megawatts (MW) of installed capacity was commissioned in 2023, almost all of which was renewable energy power plants. Of the capacity commissioned in 2023, one thousand eight hundred ninety MW (65.8%) was solar energy, four hundred fourteen MW (14.4%) was wind energy, and three hundred ninety-three MW (13.7%) was hydroelectric power plants.

Production in the white goods sector recorded a decrease of 1.5% in 2023; with a decrease of 10% in the export volume.

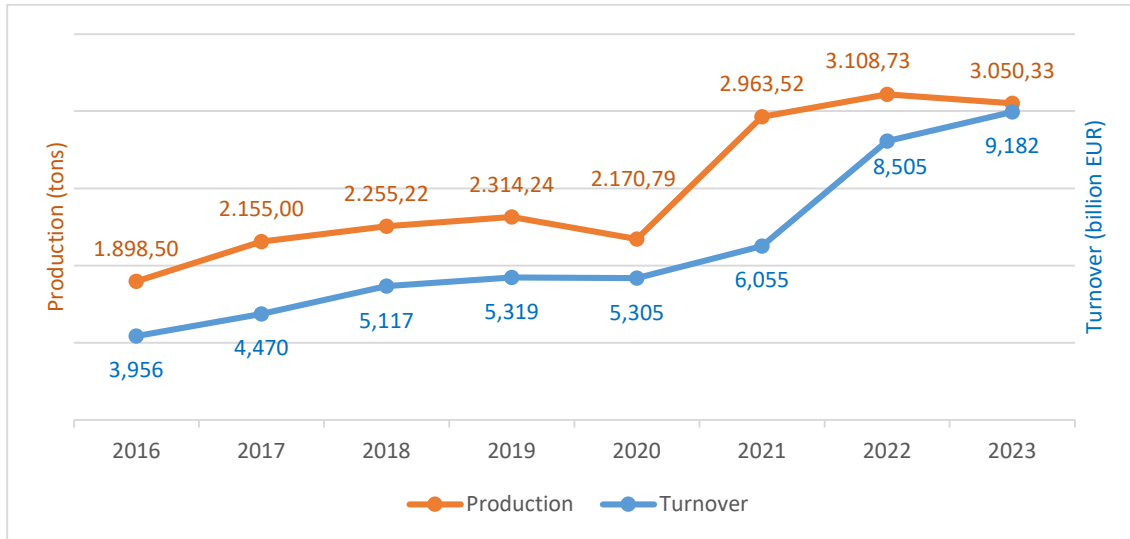
Developments In the Foundry Industry

Industry Overview

In 2023, the Turkish foundry industry managed to maintain its position despite fluctuating trends in casting buyer sectors and challenging economic conditions. The overall Turkish economy grew by 4.5%, driven by robust increases in private consumption and investment. However, the industrial sector's

performance was subdued, with the foundry industry particularly impacted by a 2.7% decrease in the exports of goods and services, alongside weak foreign demand and the February earthquakes.

Figure 4. Annual Metal Casting Production Volume and Turnover



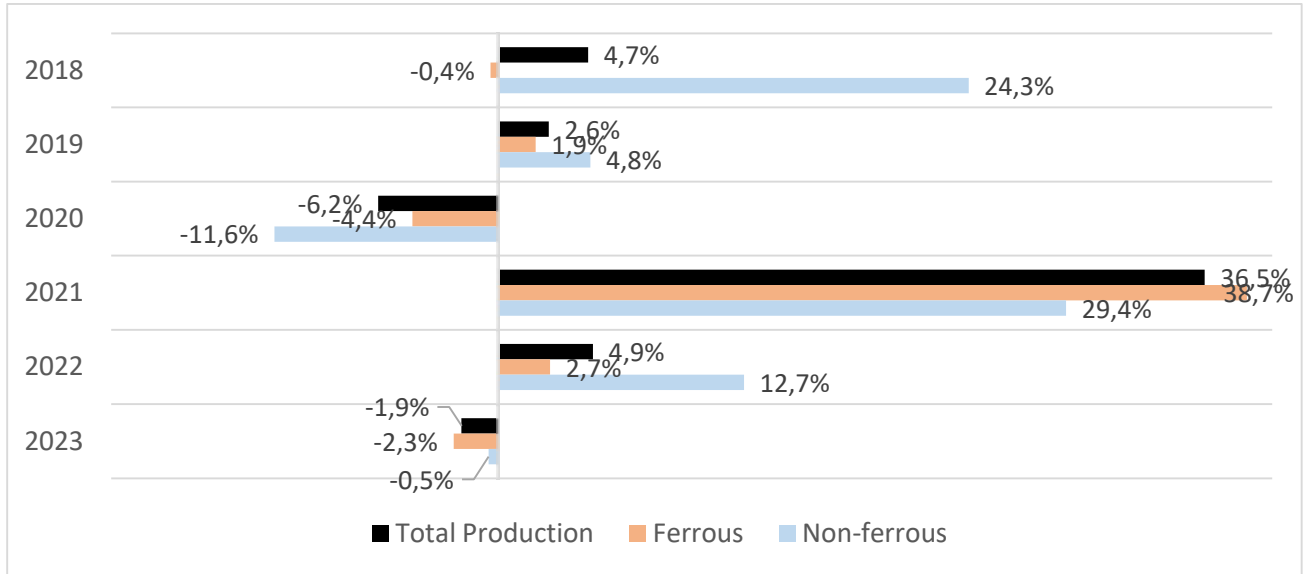
Source: TUDOKSAD – Turkish Foundry Association

Following the positive trend in the first half of 2023 to catch up on the backlog of orders that had built up in 2021 and 2022 because of the disruptions to global supply chains during and geopolitical tensions, supply chains had largely returned to normal by the middle of the year, so that demand and indicators began to give a better picture of overall demand in the markets.

The sectoral downturns especially in the last quarter influenced the foundry industry's performance, leading to a slight overall decrease in production and exports. Nevertheless, the Turkish foundry industry demonstrated resilience by navigating through these adversities with minimum losses. The ability to sustain its production levels and export activities amidst rising input costs, weak global demand, and economic volatility underscores the industry's adaptability and enduring strength in a challenging year.

The Turkish metal casting industry experienced a slight decrease of 1.9% in 2022, which brought the total production volume to three million tons.

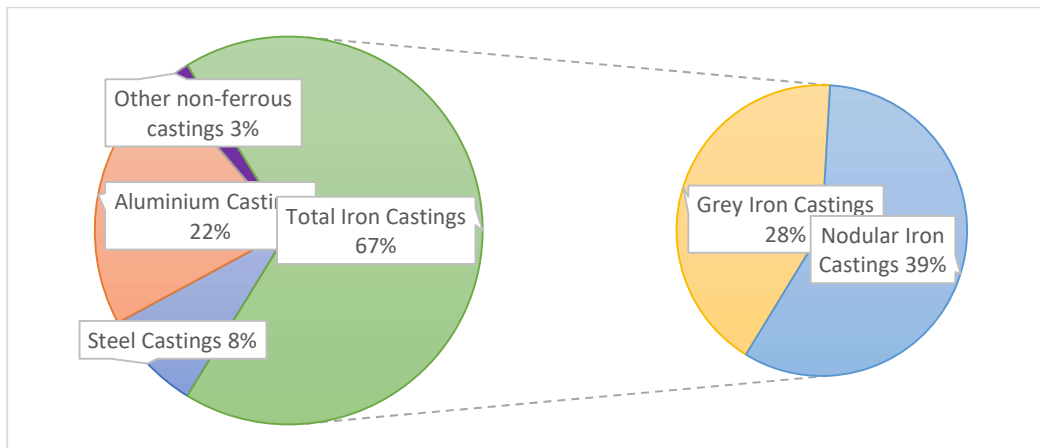
Figure 5. YoY Production Growth



Source: TUDOKSAD – Turkish Foundry Association

Despite the difficulties experienced, in the first three quarter, the industry's performance had been exceptionally well, thanks to the remarkable resilience of the industry. Despite the rising borrowing costs and tightening credit conditions, the sector continued to realize technology investments, especially to increase production speed and efficiency, as well as capacity investments with the aim of maintaining market share and competitive advantage in the international market. Along with the upward pressure in input costs, Türkiye's metal casting export increased by 7% year-on-year to six point eight billion EUR, while the export volume decreasing to two point one million tons by 2.5%.

Figure 6. Casting Production Distribution (2023)



Source: TUDOKSAD – Turkish Foundry Association

The contraction in the production volume was mainly driven by the decrease in ferrous castings production, which declined by 2.3% to two point three million tons in 2023. Gray iron casting production fell by 3.7% to eight hundred sixty-eight thousand tons, while nodular iron casting production slightly increased by 1% to one million one hundred ninety thousand tons. Together with the effect of high inflation rates, the total production value rose by 8% year-on-year to 9.2 billion EUR. The share of export to total production value finalized as 69%.

In 2023 the share of capacity and technology investments increased to 65% of the total investments; followed by investments in equipment and facility renewal around 16%).

Raw Materials

Relatively lower levels of volatility were observed in almost all the metallic input materials and secondary raw materials prices during 2023 comparing with 2022. But, without any exception, they all kept their sharp rising pace.

YoY average price increases in scrap and different types of pig iron varied between 24% and 8% in 2023 (in local currency) which were between 371% and 296% above the 2020 values. The share of raw materials costs in the cost of castings sold was around 47% in 2023.

Energy

Both electricity and natural gas prices for industrial consumption decreased in 2023, 13% and 32% respectively, which were still up 686% and 668%, respectively, compared to the year 2020, in Turkish Liras.

Labour

Based on the Turkish Statistical Institute reports, the manufacturing industry's calendar-adjusted hourly labor cost index was 109% above the previous year's figure in 2023. On the other hand, as the industry has been suffering from a lack of labor force at different levels, foundries displayed tendency to maintain the number of employees. Thus, the employment rate remained stable and the average payroll costs are higher than the country averages in the foundry industry. On average, the share of labor costs in the total cost of castings sold increased by 47% percent in 2023.

The Situation in the Material Sectors

Iron Castings

In 2023, the grey iron castings production recorded a slight decrease of 3.7% to eight hundred sixty-eight thousand and three tons, whilst nodular iron castings production increased by 1.1% to one million one hundred ninety-one thousand three hundred fifty-five tons. On the other hand, foreign demand presented an opposite trend; the export ratio of grey iron castings recorded a slight increase from 1.7% in 2022 to 1.8% in 2023; however, the export volume of nodular iron castings decreased by 2.9% and the export ratio fell to 74.1%. Capacity utilization was down 5.6 points to 69.6% due to the increased capacity as a result of ongoing investments.

Steel Castings

In 2023, steel castings production decreased to two hundred fifty-five thousand tons, showing a downward trend of 11.9%. The main drivers were weakening demand from the machinery sectors, both domestically and especially abroad. Capacity utilization deteriorated by around 14.2%, and exports decreased by 9.6% to two hundred three thousand tons.

Aluminum Castings

Aluminium castings production volume, which had been around six hundred sixty-five thousand tons the previous year, remained stable but displayed a slight decrease of 0.8% to six hundred sixty thousand tons in 2023. On the other hand, high-capacity injection moulding machine investments are increasing day by day. In 2023, capacity investments constituted more than half of the total investments for the total non-ferrous castings, which yielded a 4% increase in the total aluminium castings capacity. Consequently, aluminium castings ensured their capacity utilization at around 63.4%.

Other Non-ferrous Castings

In 2023, the production volume of other non-ferrous metal castings increased by 2.3%. Copper alloys, which accounted for 33% of non-ferrous metal castings other than aluminium, increased by 1%, while zinc castings increased by 3%.

Figure 1: Turkish Ferrous Casting Production (volume)

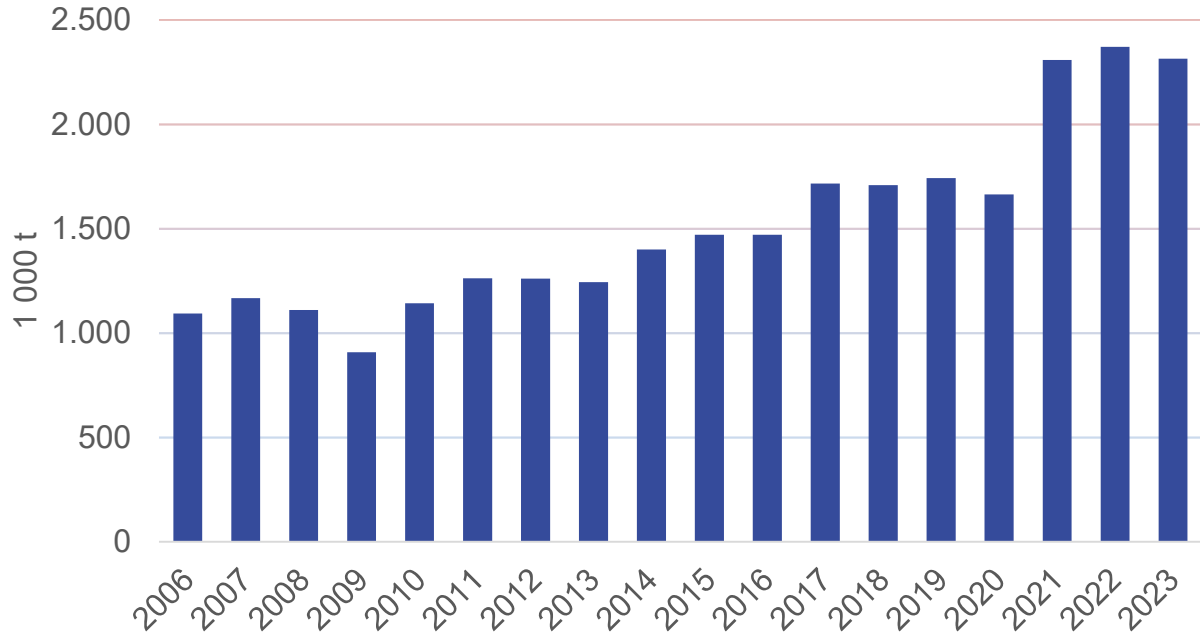
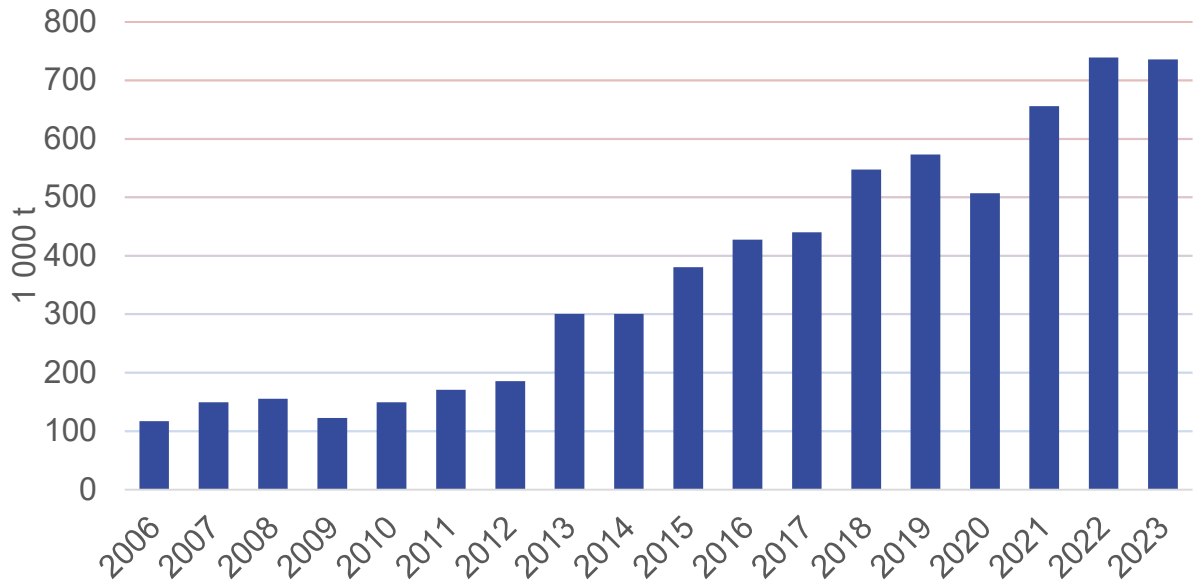


Figure 2: Turkish Non-Ferrous Casting Production (volume)





UK Economy

Gross Domestic Product

The gross domestic product of the United Kingdom in 2023 was 2.274 trillion British pounds, a slight increase when compared to the previous year, when the size of the UK economy was 2.27 trillion pounds.

Although on an annual basis, the UK economy grew slightly in 2023, the UK entered 2024 in recession following two quarters of negative economic growth at the end of 2023. After a huge 10.4 percent fall in GDP in 2020, economic growth rates were relatively strong during a period of economic recovery, with GDP growing by 8.7 percent in 2021, and 4.3 percent in 2022. This recovery has clearly stalled somewhat in 2023, however, with monthly growth figures indicating that the UK economy has been alternating between contractions and low growth for several months, and as of December 2023, was only slightly larger than it was just before the COVID-19 pandemic⁽¹⁾.

Factors contributing to low growth have included political uncertainty, the decision to leave the EU and the single market (although the amount that this has impacted the UK economy is disputed and some companies have report an increase in friction affecting trade with others reporting little or no effect but most analysis report a negative impact), as well as global factors including the Covid 19 pandemic and the war following Russia's invasion of Ukraine.

The UK currently has the second-largest economy in Europe, although the economy of France, is of a very similar size. The UK's global economic ranking will likely fall in the coming years, however, with the UK's share of global GDP expected to fall from 2.17 percent in 2024 to 2.06 percent by 2028 ⁽¹⁾.

UK Manufacturing

Manufacturing in the UK directly employs 2.6 million workers across the UK, generating an estimated £184 billion in GDP during 2022. But as the MTA report 'The True Impact of Manufacturing'⁽²⁾ notes the sector's impact on the UK economy extends to a complex network of supply chains with indirect impacts leading to MTA stating that the true value is closer to £348 billion of GDP (15% of the UK economy) and 5 million jobs (14% of the UK total) in 2022.

Further, there is an "induced" impact, which arises when those employed by manufacturers and their suppliers spend their wages in the wider economy leading to a total impact of manufacturing on UK GDP was £518 billion in 2022.

The report summarises as follows:

Manufacturing accounts for £518 billion of UK GDP and supports 7.3 million jobs,

'Making things' accounts for 34.5% of all UK goods and services exports,

The median wage in manufacturing is 11% above the national average.

Wages in Manufacturing

The average wage in the manufacturing sector was £729 per week in December⁽³⁾ (but has increased by 7.3% in 2024)⁽⁴⁾

Total annual exports increased by £36.8 billion (4.6%) to £842.6 billion in 2023 with annual imports in goods and services falling slightly by £0.1 billion to £895.6 billion.

The total annual trade in goods and services balance, excluding precious metals, narrowed by £36.7 billion to a deficit of £53.0 billion in 2023. When removing the effect of inflation, total annual imports decreased by £6.5 billion (0.9%) to £741.5 billion and total annual exports increased by £3.9 billion (0.6%) to £690.8 billion in 2023 ⁽⁵⁾.

Labour remained tight in the UK with employers across all sectors struggling to recruit and reporting skills shortages but the number of vacancies continued to fall throughout 2023, down by 229,000 from the level of a year ago, although they remained 148,000 above their pre-coronavirus (COVID-19) pandemic January to March 2020 levels.

The industry sectors showing the largest annual decreases in the number of vacancies were human health and social work, and professional, scientific and technical activities, which both fell by 34,000 from the equivalent period last year.

The estimated number of workforce jobs in September 2023 was 36.8 million, an increase of 210,000 from June 2023⁽⁶⁾.

UK Foundry Industry Performance

2023 was slightly improved picture compared with 2022 for UK foundries but some of the growth due to increased prices rather than increased tonnages.

There were 3 foundry closures and no new foundries opened. The closures were of small to medium sized ferrous foundries: two iron foundries, one in England and one in Scotland and one steel foundry in Scotland closed.

In general, most light alloy foundries were quieter across a wide range of markets but with an improvement towards the end of 2023. Many reported plenty of enquiries, and design or prototyping work for EVs, but not all have translated into firm orders, perhaps due to a lack of business confidence. Inconsistent order levels from passenger vehicle OEMs has also been a factor. Delays in obtaining tooling from the Far East, and then the tooling requiring repair or rectification, was also reported to be a factor, with price still being the main factor in purchasing decisions.

The steel casting sector has benefited from increased work for the defence sector, as well as from the oil and gas sector, and some continued demand from transport, specifically heavy vehicles.

For both light alloy foundries, and the investment sector more generally, the aerospace sector has been down and not yet back to pre-covid levels but with continued recovery in IGT work.

CMF members have reported that enquiry levels generally seem to be quite high, but within increased time for these to be converted into orders.

Key challenges for the industry continue to be:

- Energy costs
- Labour costs due to the increase in national minimum wage and the cost-of-living crisis
- Aging workforce
- Lack of skilled labour and the inability to attract new employees into the foundries

Some of these are addressed in the following sections.

Costs and Raw Materials Prices

Raw material prices continued to rise but at lower rates compared with previous years and there were some falls in national pricing trends for manufacturing.

Upward pressure on wages continued with inflation and increases in the national minimum wage leading to other wage rises to maintain differentials. In some cases, wages for operators were increased more, as a percentage, compared with increases for salaried staff.

Net Zero, Energy and Sustainability

With up to 40% of its energy now from renewable sources, an increased focus on electrification, and a mature secondary metal infrastructure, the UK should be well-placed to take advantage of any drive to reduce the carbon footprint of supply chains.

The UK will be establishing a Carbon Border Adjustment mechanism for the UK and is investing public money in more renewable energy.

The CMF established a new Advisory Panel on Net-Zero in 2022 to help the industry transition towards the UK Government's 2050 target for achieving net-zero and published a roadmap for UK foundries in 2023 to help define the key issues and the size of the opportunity for the UK.

Webinars for members on the EU CBAM, and two open seminars for CMF Members on Net Zero, have been held to help share best practice on energy efficiency and new technologies, with a further event planned for 2024.

Whilst competitiveness in the UK is generally reported to lag that of other developed economies, there are some initiatives around automation & robotics to support UK manufacturing which CMF has engaged with.

Waste disposal costs and the availability of landfill has become a concern for some foundries depending upon their geographic location in the UK, with some landfill sites not taking waste sands at least partially and, in some cases, completely. This is therefore increasing transport costs for tackling wastes as well as gate costs at waste transfer stations or landfill sites.

The Cast Metals Federation is continuing to work with other partners, including companies in the construction sector, and RTOs and Universities to help establish better classification of spent foundry sands, and find alternative uses for the spent sands and shells to prevent them from going into landfill.

Skills and Training

To help encourage more young people to consider a career in casting, CMF is supporting a pilot initiative with some of our foundries and their local schools based around a 'virtual reality' tour of a foundry featuring some young apprentices and technicians speaking about their roles.

A focus is the products that the industry makes that support modern life and the transition to a lower carbon future, the exciting job roles available and the fact that the industry uses secondary metal (recycling) so is a key part of the circular economy for metals.

The project is building on the Foundry in a Box kits which is made available for foundries to use when engaging with their local schools and colleges.

This is also supported by the UK's Professional Body for the industry, the Institute of Cast Metals Engineers, which is now seeing a growth in demand for its courses from the industry but also from end users seeking to learn about casting as a route to manufacture.

Outlook for 2024

The industry outlook for 2024 is generally positive.

There is (since early July 2024) a new Government in place, with a strong majority in Parliament (providing some stability), and with a greater focus on manufacturing as part of an industrial strategy to generate economic growth.

Sources:

1. www.statista.com/statistics/281744/gdp-of-the-united-kingdom/
2. www.mta.org.uk/trueimpactreport/
3. <https://tradingeconomics.com/united-kingdom/wages-in-manufacturing>
4. www.statista.com/statistics/800680/wage-growth-uk-by-industry-sector
5. [www.ons.gov.uk/economy/nationalaccounts/balanceofpayments/bulletins/uktrade/deceember2023#:~:text=Total%20annual%20imports%20in%20goods,in%202023%20\(Table%203\)](https://www.ons.gov.uk/economy/nationalaccounts/balanceofpayments/bulletins/uktrade/deceember2023#:~:text=Total%20annual%20imports%20in%20goods,in%202023%20(Table%203))
6. www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/bulletins/jobsandvacanciesintheuk/deceember2023



Figure 1: UK Ferrous Casting Production (volume)

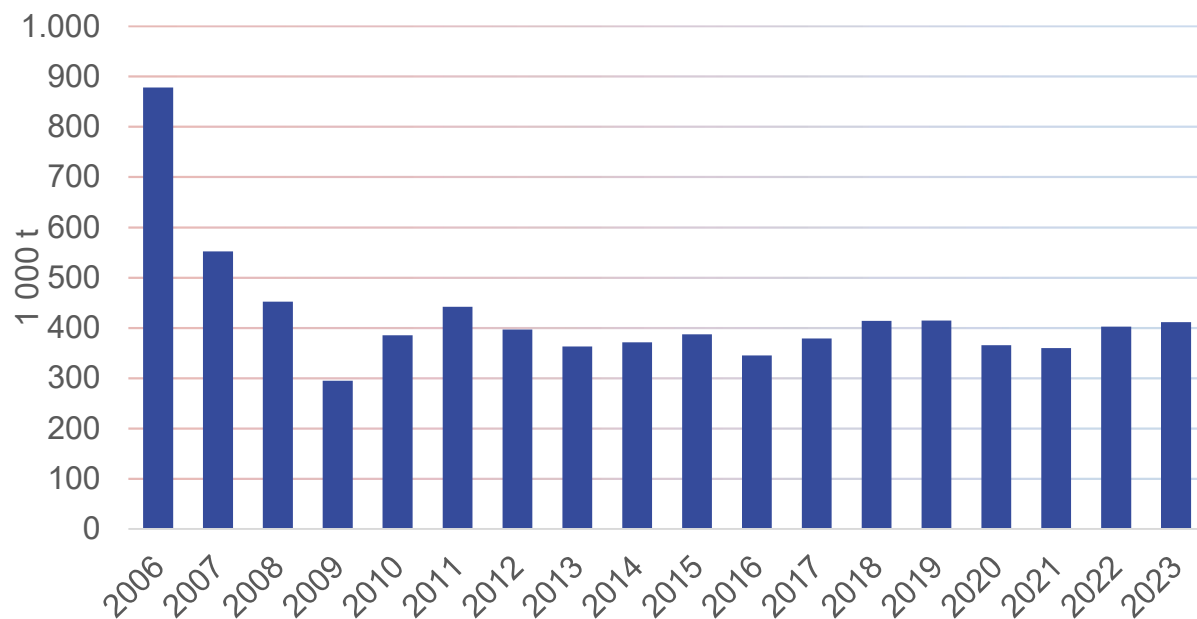
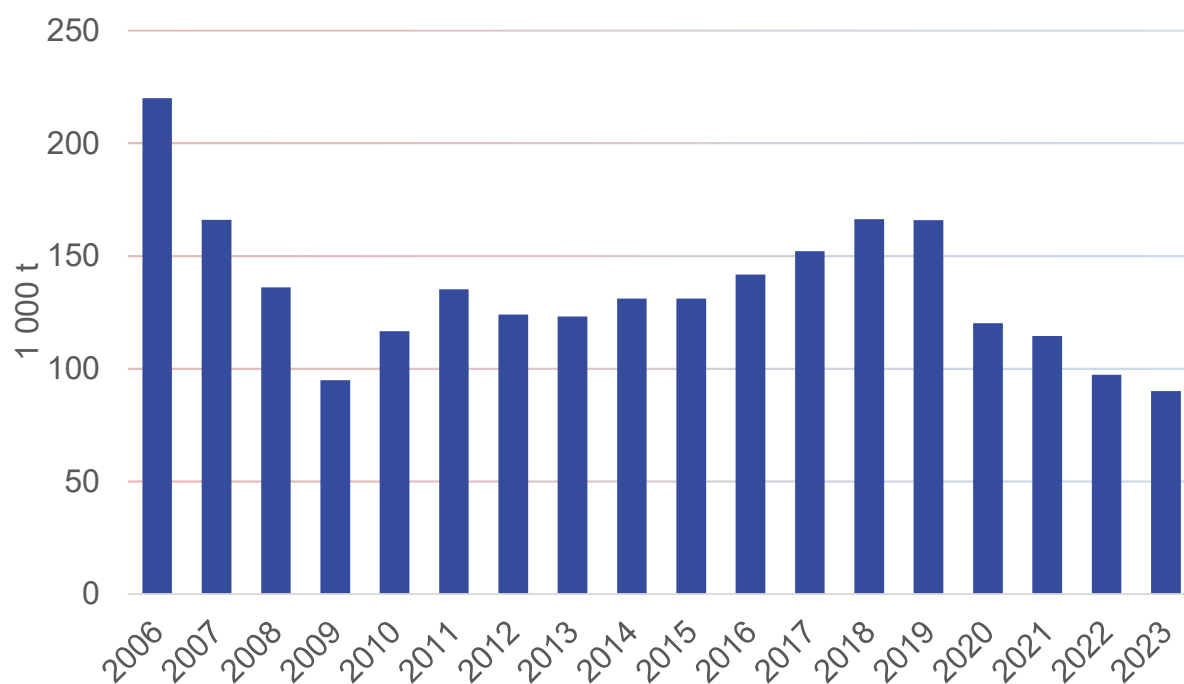


Figure 2: UK Non-Ferrous Casting Production (volume)



TABLES

IRON, DUCTILE IRON AND STEEL CASTINGS

Table 1

Total production in 1000 t - Iron, Steel and Malleable iron castings

Country	2019	2020	2021	2022	2023	2022/21 in %	2023/22 in %
Austria	158,5	134,7	152,3	149,5	138,2	-1,8	-7,6
Belgium	67,6	52,4	54,2				
Bulgaria			42,1	43,7	43,7	3,6	0,0
Croatia	29,1	25,7	34,9	36,0	35,1	3,2	-2,5
Czech Rep.	268,5	192,5	225,5	222,5	180,0	-1,3	-19,1
Denmark	86,9		82,0				
Finland	57,8	47,1	51,8	52,8	46,5	2,1	-12,0
France	1304,3	1067,4	1212,4	1244,4	1170,1	2,6	-6,0
Germany	3804,9	2714,8	3158,4	3116,4	3077,5	-1,3	-1,3
Hungary	76,2	76,4	75,2	74,9	74,9	-0,4	0,0
Italy	1108,9	893,1	1058,8	1051,0	1032,0	-0,7	-1,8
Norway	31,2		29,4				
Poland	655,0	524,0	571,2	485,5	492,5	-15,0	1,4
Portugal	140,4	106,3	120,7	114,3	121,0	-5,3	5,8
Slovenia	177,2	116,7	124,5	112,1	104,2	-9,9	-7,0
Spain	1113,3	931,1	1000,8	1022,0	1045,3	2,1	2,3
Sweden	240,4	197,2	210,4	242,0	242,0	15,0	0,0
Switzerland	26,3	22,8	23,9	25,6	24,4	6,9	-4,6
Türkiye	1741,2	1664,0	2308,0	2369,9	2314,9	2,7	-2,3
United Kingdom	414,2	365,6	359,4	402,0	411,3	11,9	2,3
Total CAEF	11.501,9	9.131,8	10.895,9	10.764,7	10.553,5	0,3	-2,0

Table 2

Production value in Mio. € - Iron, Steel and Malleable iron castings

Country	2019	2020	2021	2022	2023	2022/21 in %	2023/22 in %
Austria	431,8	382,4	436,3	511,8	523,4	17,3	2,3
Belgium							
Bulgaria			187,4	196,8	196,8	5,0	0,0
Czech Rep.							
Denmark							
Finland	177,7	142,8	154,3	198,8	181,9	28,8	-8,5
France	2769,0	2388,4	2758,1	3434,7	3529,5	24,5	2,8
Germany a)	6874,6	5448,0	6432,9	7619,0	7800,0	18,4	2,4
Hungary	226,0	232,0	247,0	225,0	225,0	-8,9	0,0
Italy	1979,0	1709,0	2232,0	2862,0	2851,0	28,2	-0,4
Norway	36,0						
Poland		816,0					
Portugal	253,2	210,5	169,2	267,1	295,0	57,8	10,4
Slovenia		136,6	243,3	215,9	197,8	-11,2	-8,4
Spain	1913,0	1731,0	1936,0	2470,0	2596,0	27,6	5,1
Sweden							
Switzerland							
Türkiye	2628,2	2774,4	3347,6	4670,7	5055,4	39,5	8,2
United Kingdom	1950,0	2340,0	2200,0	2240,0	2700,0	1,8	20,5
Total CAEF	19238,6	18311,2	20344,1	24911,8	26151,7	22,5	5,0

a) foundries > 50 employees, turnover

Table 3

Number of foundries (Production units) - Iron, Steel and Malleable iron castings

Country	2019	2020	2021	2022	2023	2022/21 in %	2023/22 in %
Austria	15	15	15	15	15	0,0	0,0
Belgium	13	13	13	13	13	0,0	0,0
Bulgaria	0		39	37	37	-5,1	0,0
Czech Rep.	71	70	69	69	67	0,0	-2,9
Denmark	8						
Finland	18	16	15	15	15	0,0	0,0
France							
Germany	232	225	220	220	211	0,0	-4,1
Hungary	39			32	32		0,0
Italy	172	172	176	171	159	-2,8	-7,0
Norway	5						
Poland	215	216	216	216	211	0,0	-2,3
Portugal	31	31	31	30	30	-3,2	0,0
Slovenia	11	11	10	10	11	0,0	10,0
Spain	71	74	74	74	69	0,0	-6,8
Sweden	36	36					
Switzerland	15	15	13	14	14	7,7	0,0
Türkiye	550	556	564	570	575	1,1	0,9
United Kingdom	207	202	197	194	191	-1,5	-1,5
Total CAEF	1.709	1.652	1.652	1.680	1.650	-0,2	-1,8

a) including investment casting

Table 4

Employment in the foundry industry - Iron, Steel and Malleables iron castings

Country	2019	2020	2021	2022	2023	2022/21 in %	2023/22 in %
Austria	2.215	2.158	2.165	2.218	2.192	2,4	-1,2
Belgium	1.766	1.727	1.633				
Bulgaria			2.548	2.439	2.439	-4,3	0,0
Czech Rep.	10.500	9.500	9.400	9.000	9.000	-4,3	0,0
Denmark	1.047						
Finland	1.264	1.170	995	1.084	921	8,9	-15,0
France							
Germany a)	39.675	35.385	34.657	34.985	34.650	0,9	-1,0
Hungary	3.720	3.620	3.506	3.340	3.340	-4,7	0,0
Italy	9.040	9.432	9.587	9.310	9.137	-2,9	-1,9
Norway							
Poland	16.000	11.125	10.600	10.600	10.600	0,0	0,0
Portugal	2.582	2.181	2.380	2.380	2.354	0,0	-1,1
Slovenia	1.110	1.277	1.321	1.355	1.334	2,6	-1,5
Spain	11.162	10.808	10.869	10.881	11.790	0,1	8,4
Sweden	7.000	7.000					
Switzerland	1.012	1.012	764	807	836	5,6	3,6
Türkiye	20.100	20.500	20.995	21.525	21.875	2,5	1,6
United Kingdom	14.150	13.850	13.700	13.510	13.190	-1,4	-2,4
Total CAEF	142.343	130.745	125.120	123.434	123.658	0,0	0,2

a) foundries >50 empl b) only workmen

Table 5

Direct exports total in 1000 t - Iron, Steel and Malleable iron castings

Country	2019	2020	2021	2022	2023	2022/21 in %	2023/22 in %
Austria							
Belgium							
Bulgaria			33,4	30,2	30,2	-9,7	0,0
Czech Rep.							
Denmark							
Finland	14,5	13,9	16,5	15,9	6,7	-3,4	-58,0
France	448,0	384,3	432,1	459,8	444,8	6,4	-3,3
Germany	1553,6	1046,2	1248,7	1288,3	1327,0	3,2	3,0
Hungary	45,1	64,9	61,5	57,7	57,7	-6,2	0,0
Italy	488,4	386,6					
Norway	16,1						
Poland		253,0	258,5	219,7	265,6	-15,0	20,9
Portugal	128,0	97,7	110,5	99,3	104,4	-10,2	5,1
Slovenia				86,7	80,6		-7,0
Spain	746,7	621,8	659,4	655,9	725,4	-0,5	10,6
Sweden							
Switzerland							
Türkiye	1086,6	981,2	1456,6	1572,7	1525,1	8,0	-3,0
United Kingdom							
Total CAEF	4527,0	3849,5	4277,2	4486,1	4567,3	2,9	1,8

IRON CASTINGS

Table 6

Total production in 1000 t - Iron castings

Country	2019	2020	2021	2022	2023	2022/21	2023/22
						in %	in %
Austria	42,3	33,4	37,1	38,6	31,9	4,0	-17,4
Belgium	55,9	43,0	44,5			-100,0	
Bulgaria			26,3	27,3	27,3	4,1	-0,1
Croatia	29,0	25,6	34,9	35,9	35,0	2,9	-2,5
Czech Rep.	166,5	117,0	140,0	138,0	110,0	-1,4	-20,3
Denmark	28,9						
Finland	18,2	17,3	20,6	20,5	16,6	-0,7	-19,0
France	537,2	431,9	503,9	505,6	470,3	0,3	-7,0
Germany	2189,0	1618,7	1873,7	1822,8	1836,9	-2,7	0,8
Hungary	18,4	16,5	16,3	16,6	16,6	1,9	0,0
Italy	667,8	534,4	616,2	616,1	610,9	0,0	-0,8
Norway	8,8						
Poland	450,0	360,0	392,4	333,5	339,5	-15,0	1,8
Portugal	41,1	26,1	39,7	35,3	37,3	-11,1	5,9
Slovenia	130,5	59,3	73,2	65,9	59,0	-10,1	-10,4
Spain	362,6	283,1	322,8	338,5	375,6	4,9	11,0
Sweden	154,9	126,0	141,7	154,2	154,2	8,8	0,0
Switzerland	9,3	8,4	8,6	9,9	8,4	15,0	-15,0
Türkiye	614,3	617,3	920,7	901,3	868,0	-2,1	-3,7
United Kingdom	144,5	128,4	128,4	136,1	132,0	6,0	-3,0
Total CAEF	5640,0	4420,7	5306,1	5160,1	5129,7	-1,9	-0,6

Table 7

Production value in Mio. € - Iron castings

Country	2019	2020	2021	2022	2023	2022/21	2023/22
						in %	in %
Austria							
Belgium							
Bulgaria			94,5	99,2	99,2	5,0	0,0
Croatia							
Czech Rep.							
Denmark							
Finland	34,4	31,9	36,1	46,9	36,4	29,7	-22,3
France							
Germany a,b)	5721,0	4519,9	5511,8	6661,0	6687,0	20,8	0,4
Hungary							
Italy							
Norway	11,0						
Poland		816,0					
Portugal	68,1	50,7	70,9	76,6		8,1	
Slovenia		108,9	132,4	170,1	156,8	28,5	-7,8
Spain a)	1537,0	1338,0	1514,0	1953,0	1924,0	29,0	-1,5
Sweden							
Switzerland							
Türkiye	626,0	765,6	1028,9	1387,3	1469,6	34,8	5,9
United Kingdom							
Total CAEF							

a) incl. nodular and malleable iron castings; b) foundries >50 empl., turnover

Table 8

Production of iron castings in 1000 t / subdivided by the major customer industries

Country	Year	1 Pressure pipes and fittings	2 Drain pipes and fittings	3 Building and domesti c goods	4 Ingot moulds and bottoms	5 Rolls	6 Eng. Plant and machinery	7 Vehicle industry	8 Any other iron castings	Total iron castings
Austria	2022									38,6
	2023	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	31,9
	in %									-17,4
Belgium	2022									44,5
	2023	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	44,5
	in %									0,0
Bulgaria	2022		2,2				17,9		6,1	27,3
	2023	0,0	2,3	0,0	0,0	0,0	13,2	0,0	11,9	27,3
	in %		1,8				-26,3		93,9	0,0
Croatia	2022									
	2023									
	in %									
Czech Rep.	2022									138,0
	2023	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	110,0
	in %									-20,3
Denmark	2022									
	2023									
	in %									
Finland	2022					3,3	0,5	1,1	15,7	20,5
	2023	0,0	0,0	0,0	0,0	2,7	1,8	4,7	7,4	16,6
	in %					-18,2	253,6		-53,1	-19,2
France	2022									505,6
	2023	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	470,3
	in %									-7,0
Germany	2022						381,4	1220,4	226,9	1822,6
	2023	0,0	0,0	0,0	0,0	0,0	401,4	1247,3	188,2	1836,9
	in %						5,3	2,2	-17,0	0,8
Hungary	2022									16,6
	2023	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	16,6
	in %									0,0
Italy	2022									616,1
	2023									610,9
	in %									-0,8
The Netherlands	2022									
	2023									
	in %									
Norway	2022									
	2023									
	in %									
Poland	2022									333,5
	2023	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	339,5
	in %									1,8
Portugal	2022		1,1	1,1			1,1	33,9	2,6	35,3
	2023		0,7	1,7	0,0	0,0	1,0	32,0	1,8	37,3
	in %		-41,0	57,6			-13,2	-5,6	-32,4	5,8
Slovenia	2022									65,9
	2023	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	59,0
	in %									-10,4
Spain	2022	2,0		16,1			46,7	250,3	7,8	338,5
	2023	10,8	0,0	13,1	0,0	0,0	83,2	259,8	8,7	375,6
	in %	438,8		-18,7			78,2	3,8	11,4	11,0
Sweden	2022									154,2
	2023	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	154,2
	in %									0,0
Switzerland	2022									9,9
	2023	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	8,4
	in %									-14,8
Türkiye	2022	22,5	21,5	111,4	37,5	27,1	351,1	284,5	65,2	901,3
	2023	16,2	15,2	109,3	24,3	17,2	349,2	283,7	52,7	868,0
	in %	-27,8	-29,1	-1,8	-35,1	-36,5	-0,5	-0,3	-19,2	-3,7
United Kingdom	2022									136,1
	2023	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	132,0
	in %									-3,0

Table 9

Number of foundries (Production units) - Iron castings (incl. nodular and malleable castings)

Country	2019	2020	2021	2022	2023	2022/21 in %	2023/22 in %
Austria	12	12	12	12	12	0,0	0,0
Belgium	5	5	5			-100,0	
Bulgaria			29	28	28	-3,4	0,0
Czech Rep.	56	55	54	54	53	0,0	-1,9
Denmark	8						
Finland	11	11	11	11	11	0,0	0,0
France							
Germany a)	144	140	134	134	134	0,0	0,0
Hungary	27	27	27	27	27	0,0	0,0
Italy	134	134	136	136	127	0,0	-6,6
Norway	5						
Poland	180	180	180	180	176	0,0	-2,2
Portugal	23	23	23	22	22	-4,3	0,0
Slovenia	11	8	7	7	8	0,0	14,3
Spain	42	43	43	42	39	-2,3	-7,1
Sweden	25						
Switzerland	13	13	10	11	11	10,0	0,0
Türkiye	443	447	452	455	458	0,7	0,7
United Kingdom							
Total CAEF	1139	1098	1123	1107	1106	-1,0	-0,1

a) foundries >50 employees

Table 10

Employment in the foundry industry - Iron castings (incl. nodular and malleable castings)

Country	2019	2020	2021	2022	2023	2022/21 in %	2023/22 in %
Austria							
Belgium							
Bulgaria			1969	1893	1893	-3,9	0,0
Czech Rep.							
Denmark	1047						
Finland	724	645	629	698	558	11,0	-20,1
France							
Germany a)	34096	29496	29276	29875	29401	2,0	-1,6
Hungary		3450	3340	3210	3210	-3,9	0,0
Italy	6736	7119	7256	6978	6850	-3,8	-1,8
Norway							
Poland	12500	8010	7400	7400	7400	0,0	0,0
Portugal	2064	1684	1861	1861	1795	0,0	-3,5
Slovenia	1110	1066	1120	1154	1154	3,0	0,0
Spain	8800	8182	8199	8144	8737	-0,7	7,3
Sweden							
Switzerland	910	910	527			-100,0	
Türkiye	13600	13875	14225	14525	14725	2,1	1,4
United Kingdom							
Total CAEF	81.587	74.437	75.802	75.738	75.723	0,6	0,0

Table 11

Direct exports total in 1000 t - Iron castings (incl. nodular iron castings)

Country	2019	2020	2021	2022	2023	2022/21 in %	2023/22 in %
Austria							
Belgium							
Bulgaria			30,0	26,9	26,9	-10,2	0,0
Czech Rep.							
Denmark							
Finland	12,9	11,9	15,2	15,6	5,7	2,4	-63,4
France	429,2	371,2	418,7	446,0	430,6	6,5	-3,5
Germany a)	1455,2	978,2	1179,4	1218,3	1267,9	3,3	4,1
Hungary		64,9	61,5			-100,0	
Italy							
Norway	16,1						
Poland		237,0	258,5	219,7	251,6	-15,0	14,5
Portugal	124,3	94,6	107,4	95,3	100,6	-11,3	5,5
Slovenia							
Spain a)	693,0	569,6	603,1	594,6	651,6	-1,4	9,6
Sweden							
Switzerland							
Türkiye	936,8	862,0	1291,2	1348,0	1322,0	4,4	-1,9
United Kingdom							
Total CAEF	3667,5	3189,5	3964,9	3964,4	4056,8	0,0	2,3

a) incl. malleable iron castings

DUCTILE IRON CASTINGS

Table 12

Total production in 1000 t - Ductile iron castings (Nodular and Malleable iron castings)

Country	2019	2020	2021	2022	2023	2022/21	2023/22
						in %	in %
Austria	104,7	91,7	104,8	104,1	99,9	-0,7	-4,1
Belgium	5,1	3,9	4,5			-100,0	
Bulgaria			11,0	11,6	11,6	5,2	0,0
Croatia	6,9	6,1	11,0	6,5	6,7	-40,9	3,1
Czech Rep.	50,0	34,5	41,0	40,5	33,0	-1,2	-18,5
Denmark	58,1						
Finland	29,3	23,1	25,5	27,1	25,0	6,0	-7,4
France	711,4	593,6	665,5	691,1	650,3	3,8	-5,9
Germany	1433,7	957,1	1140,9	1126,5	1103,9	-1,3	-2,0
Hungary	55,6	58,0	57,2	56,6	56,6	-1,1	0,0
Italy	381,3	300,6	385,9	376,0	360,3	-2,6	-4,2
Norway	22,3						
Poland	155,0	124,0	135,2	114,9	117,9	-15,0	2,6
Portugal	94,4	76,1	76,6	73,7	78,6	-3,8	6,6
Slovenia	46,7	39,8	47,4	42,0	39,3	-11,5	-6,3
Spain	663,0	582,8	608,8	606,2	585,0	-0,4	-3,5
Sweden	62,0	51,0	47,5	65,9	65,9	38,7	0,0
Switzerland	14,7	11,9	12,9	13,1	13,2	1,8	0,2
Türkiye	934,4	854,7	1108,1	1178,5	1191,4	6,4	1,1
United Kingdom	220,5	195,6	195,6	228,7	244,7	17,0	7,0
Total CAEF	5042,3	3998,4	4668,2	4756,4	4683,2	2,0	-1,5

Table 13

Production value in Mio. € - Ductile iron castings (Nodular and Malleable iron castings)

Country	2019	2020	2021	2022	2023	2022/21	2023/22
						in %	in %
Austria							
Belgium							
Bulgaria			43,8	46,0	46,0	5,0	0,0
Croatia							
Czech Rep.							
Denmark							
Finland	71,5	52,0	63,0	83,8	78,1	33,1	-6,9
France							
Germany a)							
Hungary							
Italy				2358			-100,0
Norway	25,0						
Poland							
Portugal	143,5	121,7	129,5	144,6	0,2	11,7	-99,9
Slovenia							
Spain a)							
Sweden							
Switzerland							
Türkiye	1.382,5	1.401,2	1.665,9	2.462,9	2.736,4	47,8	11,1
United Kingdom							
Total CAEF							

a) contained in: Tab. 7

Table 14

Production of Ductile iron castings (Nodular and Malleable iron castings) in 1000 t
subdivided by the major customer industries

Country	Year	1 Pressure pipes and fittings	2 Eng. plant and machinery	3 Vehicle industry	4 Any other nodular iron castings	Total nodular iron castings
Austria	2022					104,1
	2023					99,9
	in %					-4,1
Belgium	2022					3,9
	2023					4,5
	in %					14,4
Bulgaria	2022	2,2	5,2		3,5	11,6
	2023	2,3	4,8	0,0	4,5	11,6
	in %	1,8	-9,0		28,2	-0,1
Croatia	2022					
	2023					
	in %					
Czech Rep.	2022					40,5
	2023					33,0
	in %					-18,5
Denmark	2022					
	2023					
	in %					
Finland	2022		6,1		19,5	27,1
	2023	0,0	8,1	6,1	10,8	25,0
	in %		33,5		-44,4	-7,6
France	2022					691,1
	2023					650,3
	in %					-5,9
Germany	2022		424,5	428,0	246,5	1126,5
	2023	0,0	345,0	502,3	256,6	1103,9
	in %		-18,7	17,4	4,1	-2,0
Hungary	2022					56,6
	2023					56,6
	in %					0,0
Italy	2022	42,1	213,1	109,6	21,1	376,0
	2023	0,0	0,0	0,0	0,0	360,3
	in %	-100,0	-100,0	-100,0	-100,0	-4,2
Norway	2022					
	2023					
	in %					
Poland	2022					114,9
	2023					117,9
	in %					2,6
Portugal	2022	7,9	0,8	66,3	1,6	73,7
	2023	8,5	0,7	65,5	3,8	78,6
	in %	8,0	-3,7	-1,2	129,6	6,6
Slovenia	2022					42,0
	2023					39,3
	in %					-6,4
Spain	2022	135,2	162,8	293,1	17,7	606,2
	2023	114,9	91,0	364,0	15,1	585,0
	in %	-15,0	-44,1	24,2	-14,7	-3,5
Sweden	2022					65,9
	2023					65,9
	in %					0,0
Switzerland	2022					13,1
	2023					13,2
	in %					0,5
Türkiye	2022	137,8	370,8	462,5	137,0	1178,5
	2023	139,9	396,5	492,5	162,4	1191,4
	in %	1,5	6,9	6,5	18,5	1,1
United Kingdom	2022					228,7
	2023					244,7
	in %					7,0

STEEL CASTINGS

Table 15

Total production in 1000 t - Steel castings

Country	2019	2020	2021	2022	2023	2022/21	2023/22
						in %	in %
Austria	11,4	9,6	10,3	6,8	6,4	-34,2	-5,7
Belgium	6,6	5,5	5,3			-100,0	
Bulgaria			4,9	4,7	4,7	-2,7	0,0
Croatia	0,1	0,1	0,1	0,1	0,1	0,0	0,0
Czech Rep.	52,0	41,0	44,5	44,0	37,0	-1,1	-15,9
Denmark							
Finland	10,4	6,7	5,7	5,3	4,9	-5,9	-7,9
France	55,7	41,9	43,1	47,8	49,4	10,9	3,4
Germany	178,2	138,0	143,8	167,1	136,7	16,2	-18,2
Hungary	2,2	2,0	1,7	1,7	1,7	2,6	0,0
Italy	59,9	58,0	56,8	58,9	60,8	3,8	3,1
Norway							
Poland a)	50,0	40,0	43,6	37,1	35,1	-15,0	-5,4
Portugal	4,9	4,1	4,4	5,4	5,1	22,0	-5,3
Slovenia		17,6	3,8	4,3	5,9	12,1	37,9
Spain	71,4	65,3	69,2	77,3	84,7	11,8	9,6
Sweden	23,5	20,2	21,2	21,9	21,9	3,3	0,0
Switzerland	2,3	2,5	2,4	2,5	2,8	5,1	11,2
Türkiye	192,5	192,0	279,3	290,1	255,6	3,9	-11,9
United Kingdom	49,2	41,6	35,4	37,1	34,5	5,0	-7,0
Total CAEF	770,2	686,0	775,3	812,1	747,3	5,5	-8,0

Table 16

Production value in Mio. € - Steel castings

Country	2019	2020	2021	2022	2023	2022/21	2023/22
						in %	in %
Austria							
Belgium							
Bulgaria			49,1	51,5	51,5	5,0	0,0
Croatia							
Czech Rep.							
Denmark							
Finland	71,9	59,0	55,2	68,1	67,5	23,4	-1,0
France							
Germany a)	1137,2	945,4	921,1	958,0	1113,0	4,0	16,2
Hungary							
Italy				504,0			-100,0
Norway							
Poland							
Portugal	41,6	38,2	42,9	45,8	0,1	6,9	-99,9
Slovenia		27,7					
Spain	376,0	393,0	422,0	517,0	672,0	22,5	30,0
Sweden							
Switzerland							
Türkiye	619,7	607,6	652,8	820,5	849,4	25,7	3,5
United Kingdom							
Total CAEF	2246,4	2070,8	2143,1	2965,0	2753,4	14,8	11,9

a) foundries >50 employees

Table 17

Production of steel castings in 1000 t / subdivided by the major customer industries

Country	Year	1 Eng. plant and machinery	2 Vehicle industry	3 Steel castings for railways, locomotives, carriages, wagons and trams	4 Any other steel castings	Total steel castings
Austria	2022					6,8
	2023					6,4
	in %					-5,7
Belgium	2022					
	2023					
	in %					
Bulgaria	2022	1,0			3,8	4,7
	2023	1,0			3,8	4,7
	in %	0,0			0,0	0,0
Croatia	2022					
	2023					
	in %					
Czech Rep.	2022					44,0
	2023					37,0
	in %					-15,9
Denmark	2022					
	2023					
	in %					
Finland	2022	0,9	0,7		4,0	5,3
	2023	2,0	0,4	0,0	2,6	4,9
	in %	119,7			-36,2	-7,5
France	2022					47,8
	2023					49,4
	in %					3,3
Germany	2022	23,0	9,9		110,8	167,1
	2023	20,1	9,6	0,0	106,9	136,7
	in %	-12,5	-2,4		-3,5	-18,2
Hungary	2022					1,7
	2023					1,7
	in %					0,0
Italy	2022	9,9	3,0	1,4	42,4	58,9
	2023	34,9	11,1	0,0	14,8	60,8
	in %	252,9	268,7	-100,0	-65,2	3,2
Norway	2022					
	2023					
	in %					
Poland	2022					37,1
	2023					35,1
	in %					-5,5
Portugal	2022	2,3	0,3	0,1	1,7	5,4
	2023	1,6	0,3	0,2	3,1	5,1
	in %	-29,4	6,9	48,5	80,1	-5,8
Slovenia	2022					4,3
	2023					5,9
	in %					36,9
Spain	2022	45,5	2,0	15,3	6,4	77,3
	2023	54,5	4,2	23,0	3,0	84,7
	in %	19,8	108,8	50,5	-52,7	9,6
Sweden	2022					21,9
	2023					21,9
	in %					0,0
Switzerland	2022					2,5
	2023					2,8
	in %					12,9
Türkiye	2022	113,4	29,5	39,2	97,3	290,1
	2023	106,5	27,2	36,4	85,5	255,6
	in %	-6,1	-8,0	-7,1	-12,1	-11,9
United Kingdom	2022					37,1
	2023					34,5
	in %					-6,9

Table 18

Number of foundries (Production units) - Steel castings

Country	2019	2020	2021	2022	2023	2022/21	2023/22
						in %	in %
Austria	3	3	3	3	3	0,0	0,0
Belgium	8	8	8				
Bulgaria	0		10	9	9	-10,0	0,0
Croatia	0						
Czech Rep.	28	27	27	27	26	0,0	-3,7
Denmark	0						
Finland	7	7	6	6	6	0,0	0,0
France							
Germany a)	41	39	38	38	38	0,0	0,0
Hungary	12	0	6	5	5	-16,7	0,0
Italy	38	38	40	35	32	-12,5	-8,6
Norway	0						
Poland	35	36	36	36	35	0,0	-2,8
Portugal	8	8	8	8	8	0,0	0,0
Slovenia	0	3	3	3	3	0,0	0,0
Spain	29	31	31	32	30	3,2	-6,3
Sweden	11						
Switzerland	2	2	3	3	3	0,0	0,0
Türkiye	107	109	112	115	117	2,7	1,7
United Kingdom							
Total CAEF	320	329	331	320	315	-0,3	-1,6

a) foundries >50 empl.

Table 19

Number of persons employed total - Steel castings

Country	2019	2020	2021	2022	2023	2022/21	2023/22
						in %	in %
Austria							
Belgium							
Bulgaria			579	546	546	-5,7	0,0
Czech Rep.							
Denmark							
Finland	540	525	366	386	363	5,5	-6,0
France							
Germany a)	6657	5889	5386	5110	5249	-5,1	2,7
Hungary		170	166	130	130	-21,7	0,0
Italy	2304	2313	2331	2332	2287	0,0	-1,9
Norway							
Poland	3500	3115	3200	3200	3200	0,0	0,0
Portugal	518	497	519	519	559	0,0	7,7
Slovenia		211	201	201	180	0,0	-10,4
Spain	2362	2626	2670	2737	3053	2,5	11,5
Sweden							
Switzerland	102	102	237				
Türkiye	6500	6625	6770	7000	7150	3,4	2,1
United Kingdom							
Total CAEF	22483	22073	22425	22161	22717	-0,1	2,5

a) foundries >50 empl.

Table 20

Direct exports total in 1000 t - Steel castings

Country	2019	2020	2021	2022	2023	2022/21 in %	2023/22 in %
Austria							
Belgium							
Bulgaria			3,5	3,3	3,3	-7,1	0,0
Croatia							
Czech Rep.							
Denmark							
Finland	1,6	2,0	1,2	0,3	1,0	-74,3	203,4
France	18,8	13,1	13,5	13,8	14,2	2,8	2,8
Germany	83,6	67,6	69,3	70,0	59,2	1,0	-15,4
Hungary							
Italy							
Norway							
Poland	16,0	16,0			14,0		
Portugal	3,7	3,1	3,1	4,0	3,8	28,1	-4,8
Slovenia							
Spain	53,7	52,2	56,3	61,3	73,8	8,8	20,4
Sweden							
Switzerland							
Türkiye	149,8	119,2	165,4	224,7	203,1	35,9	-9,6
United Kingdom							
Total CAEF	327,2	273,2	312,2	377,3	372,3	20,8	-5,1

NON-FERROUS METAL CASTINGS

Table 21

Total production in 1000 t - Non-ferrous metal castings

Country	2019	2020	2021	2022	2023	2022/21	2023/22
						in %	in %
Austria	144,8	121,4	139,6	141,9	132,1	1,7	-6,9
Belgium	1,0	1,7	1,6				
Bulgaria			6,0	6,1	6,1	0,8	0,0
Croatia	45,8	65,9	60,8	34,1	74,9	-43,9	119,6
Czech Rep.	116,0	94,5	108,3	105,5	98,0	-2,6	-7,1
Denmark	3,5		3,2				
Finland	5,3	4,1	6,1	6,3	4,5	2,8	-27,9
France	392,4	330,7	339,9	340,4	353,7	0,1	3,9
Germany	1019,2	769,4	806,1	810,3	834,2	0,5	3,0
Hungary	124,0	121,7	121,6	126,0	126,0	3,6	0,0
Italy	827,3	659,2	880,5	820,6	828,0	-6,8	0,9
Norway a)	6,5		5,9				
Poland	356,5	285,2	310,9	264,2	261,6	-15,0	-1,0
Portugal	56,5	50,3	50,6	51,5	49,2	1,8	-4,5
Slovenia	75,7	53,1	64,3	66,4	64,0	3,3	-3,6
Spain	153,9	124,6	127,7	131,4	136,3	2,9	3,7
Sweden	65,1	56,4	60,0	60,0	60,0	0,0	0,0
Switzerland	15,9	13,6	14,8	15,4	15,6	4,1	1,0
Türkiye	573,0	506,8	655,5	738,8	735,4	12,7	-0,5
United Kingdom	165,8	120,1	114,5	97,3	90,0	-4,7	-7,5
Total CAEF	4102,6	3312,8	3817,0	3763,5	3869,6	-1,7	2,8

a) without copper (only 2 foundries = no data collection)

Table 22

Production value in Mio. € - Non-ferrous metal castings

Country	2019	2020	2021	2022	2023	2022/21	2023/22
						in %	in %
Austria	973,7	811,7	959,7	1150,3	1177,5	19,9	2,4
Belgium							
Bulgaria			27,6	30,3	30,3	10,0	0,0
Croatia							
Czech Rep.							
Denmark							
Finland	51,0	45,2	53,7	62,5	61,9	16,4	-0,9
France	2373,0	1882,6	2095,5	2459,1	2530,4	17,4	2,9
Germany a)	5558,2	4429,0	5190,0	6209,0	6157,0	19,6	-0,8
Hungary	387,0	390,0	408,0	450,0	450,0	10,3	0,0
Italy	4390,0	3569,0	4646,0	3053,4	0,0	-34,3	-100,0
Norway	51,0						
Poland							
Portugal	381,1	324,7	323,4	376,2	356,0	16,3	-5,4
Slovenia		0,0	650,9	803,0	837,8	23,4	4,3
Spain	1020,0	803,0	893,0	1039,0	998,0	16,3	-3,9
Sweden							
Switzerland							
Türkiye	2690,8	2530,4	2707,6	3834,0	4126,2	41,6	7,6
United Kingdom	1050,0	950,0	920,0	840,0	892,0	-8,7	6,2
Total CAEF	18925,7	15735,6	18875,5	20306,9	17617,0	7,6	-13,2

a) foundries >50 employees

Table 23

Number of foundries (Production units) - Non-ferrous metal castings

Country	Total		thereof:					
	2022	2023	Pressure die casting		Other Light casting		Other Heavy metal alloy casting	
	2022	2023	2022	2023	2022	2023	2022	2023
Austria	22	21	0	0	0	0	0	0
Belgium	6	6	0	0	0	0	0	0
Bulgaria	23	22	22	21	1	1		0
Croatia								0
Czech Rep.	37	37	0	0	0	0	0	0
Denmark								
Finland	13	12	5	4	4	4	4	4
France	0	0	0	0	0	0	0	0
Germany	322	315	0	0	0	0	0	0
Hungary	32	32	20	20	8	8	4	4
Italy	843	732	0	0	0	0	0	0
Norway								
Poland	240	238	240	238	0	0	0	0
Portugal	57	57	28	28	12	12	17	17
Slovenia	45	42	0	0	0	0	0	0
Spain	52	52	35	34	17	18	0	0
Sweden			0	0	0	0	0	0
Switzerland	30	30						
Türkiye	404	412	305	310	62	65	37	37
United Kingdom	191	189	0	0	0	0	0	0
Total CAEF	2317	2197	655	655	104	108	62	62

Table 24

Employment in the foundry industry - Non-ferrous metal castings

Country	2019	2020	2021	2022	2023	2022/21	2023/22
						in %	in %
Austria	4718	4380	4357	4239	3938	-2,7	-7,1
Belgium	496	494	466	466	466	0,0	0,0
Bulgaria			595	587	587	-1,3	0,0
Croatia							
Czech Rep.	4000	4000	4000	4000	4500	0,0	12,5
Denmark	372						
Finland	381	344	350	361	379	3,1	5,0
France							
Germany a)	35522	32473	31242	33662	32722	7,7	-2,8
Hungary	5230	5250	5333	4800	4800	-10,0	0,0
Italy	18815	18813	18878	14524	14061	-23,1	-3,2
Norway	287						
Poland	8300	7387	11200	11200	11200	0,0	0,0
Portugal	3365	3293	3339	3289	3108	-1,5	-5,5
Slovenia	4032	3669	3576	3547	3646	-0,8	2,8
Spain	5242	4623	4597	4753	4475	3,4	-5,8
Sweden	7000						
Switzerland	1450	1450	1166	1165	1224	-0,1	5,1
Türkiye	13750	13850	14150	14250	14320	0,7	0,5
United Kingdom	13150	13000	12560	12390	10530	-1,4	-15,0
Total CAEF	126110	113026	115809	113233	109956	-2,2	-2,9

a) foundries > 50 employees

COPPER ALLOY CASTINGS

Table 25

Total production in t - Copper alloy castings

Country	2019	2020	2021	2022	2023	2022/21 in %	2023/22 in %
Austria							
Belgium							
Bulgaria			320,0	340,0	340,0	6,3	0,0
Croatia							
Czech Rep.	20000,0	16000,0	18000,0	17000,0	15000,0	-5,6	-11,8
Denmark	1188,0						
Finland	3124,0	2415,0	2508,0	2678,0	2734,0	6,8	2,1
France	17409,0	16118,0	17704,9	18459,1	17696,3	4,3	-4,1
Germany	77224,7	46076,1	48424,7	46633,0	66737,0	-3,7	43,1
Hungary	483,0	729,0	701,0	310,0	310,0	-55,8	0,0
Italy	48232,0	38168,0	51946,7	46869,2	48022,1	-9,8	2,5
Norway							
Poland a)	6000,0	4800,0	5232,0	4448,0	4442,0	-15,0	-0,1
Portugal	17054,0	16203,0	14699,0	14225,0	13496,0	-3,2	-5,1
Slovenia	872,0	990,0	1005,0	1125,0	1050,0	11,9	-6,7
Spain	14634,0	15279,0	12807,0	12617,0	13764,0	-1,5	9,1
Sweden		0,0					
Switzerland	2131,0	2023,0	2039,0	1935,0	2131,0	-5,1	10,1
Türkiye	29285,0	24851,0	33388,0	24336,7	24580,0	-27,1	1,0
United Kingdom	8650,0	8300,0	7885,0	7860,0	8646,0	-0,3	10,0
Total CAEF	246286,7	191952,2	216660,4	198836,0	218948,5	-8,2	10,1

Table 26

Production value in Mio. € - Copper alloy castings

Country	2019	2020	2021	2022	2023	2022/21 in %	2023/22 in %
Austria							
Belgium							
Bulgaria			1,6	1,7	1,7	9,6	0,0
Croatia							
Czech Rep.							
Denmark							
Finland	29,7	27,0	28,5	31,2	29,8	9,7	-4,5
France							
Germany a)	865,6	777,4	925,5	1020,0	1043,0	10,2	2,3
Hungary							
Italy							
Norway							
Poland							
Portugal	114,6	105,1	104,0	113,1	104,0	8,7	-8,0
Slovenia							
Spain		168,0	89,0	106,0	100,0	19,1	-5,7
Sweden							
Switzerland							
Türkiye	237,1	190,7	207,4	159,9	163,1	-22,9	2,0
United Kingdom							
Total CAEF	1247,0	1268,2	1355,9	1431,9	1441,6	5,6	0,7

a) copper and zinc; foundries >50 employees

Table 27
Copper alloy castings in t

Country	Year	Sandcast and gravity die castings					Pressure die casting (Messing, Laiton, Brass)	general engineering	automotive industry	other	Total production
		Total	thereof: Copper	Aluminium Bronze	other Bronzes	Brass					
Austria	2022										
	2023										
Belgium	2022										
	2023										
Bulgaria	2022										340,0
	2023	0,0	0,0	0,0	0,0	0,0	340,0	0,0	0,0	0,0	340,0
Croatia	2022										
	2023										
Czech Rep.	2022										17000,0
	2023										15000,0
Denmark	2022										
	2023										
Finland	2022	2508,0		343,0	1102,0	1063,0					2678,0
	2023	2734,0	0,0	541,0	1537,0	656,0	0,0		0,0		2734,0
France	2022										18459,0
	2023										17696,3
Germany	2022	29271,0					19153,6			48363,0	46633,0
	2023	24866,0					41871,0			66895,0	66737,0
Hungary	2022										310,0
	2023										310,0
Italy	2022										46869,0
	2023										48022,1
Norway	2022										
	2023										
Poland	2022										4448,0
	2023										4442,0
Portugal	2022	14699,0		1750,0	2960,0	9989,0		3100,0		11599,0	14225,0
	2023	0,0	0,0	1550,0	2660,0	9286,0	9286,0	2750,0		10746,0	13496,0
Slovenia	2022										1125,0
	2023										1050,0
Spain	2022	12807,0						9949,0	207,0	2651,0	12617,0
	2023	13764,0	0,0	0,0	0,0	0,0	0,0	9920,0	602,0	3242,0	13764,0
Sweden	2022										
	2023										
Switzerland	2022	2039,0									1935,0
	2023	2131,0									2131,0
Türkiye	2022	16576,0	5259,0	3985,0	1754,0	5578,0	7767,0	6355,0	2690,0		24337,0
	2023	12622,0	4012,0	2962,0	1222,0	4426,0	5578,0	4356,0	2024,0		24580,0
United Kingdom	2022										7860,0
	2023										8646,0
	2022										
	2023										

LIGHT AND ULTRALIGHT CASTINGS

Table 28

Total production in t - Light and ultralight castings

Country	2019	2020	2021	2022	2023	2022/21	2023/22
						in %	in %
Austria	133406,0	111302,0	127971,0	131859,0	123972,0	3,0	-6,0
Belgium	683,0	539,0					
Bulgaria			5700,0	5730,0	5730,0	0,5	0,0
Croatia							
Czech Rep.	95000,0	77700,0	89400,0	87600,0	82200,0	-2,0	-6,2
Denmark	2224,0						
Finland	2184,0	1730,0	3604,0	3604,0	1797,0	0,0	-50,1
France	348062,0	293528,8	299015,9	299255,4	314266,9	0,1	5,0
Germany	1011598,7	673227,0	716615,9	716465,0	740610,0	0,0	3,4
Hungary	122675,0	119186,0	119304,0	124013,0	124013,0	3,9	0,0
Italy	685584,0	543972,0	732536,9	685046,5	687213,0	-6,5	0,3
Norway	6526,0						
Poland	340000,0	272000,0	296480,0	252008,0	250000,0	-15,0	-0,8
Portugal	37009,0	31966,0	33050,0	34859,0	33673,0	5,5	-3,4
Slovenia	54625,0	44618,0	52692,0	55576,0	57912,0	5,5	4,2
Spain	129345,0	101317,0	106185,0	110522,0	114618,0	4,1	3,7
Sweden	48000,0	39195,0	45000,0	48000,0	48000,0	6,7	0,0
Switzerland	12699,0	10815,0	11726,0	12362,0	12531,0	5,4	1,4
Türkiye	504328,0	450264,0	579124,0	665930,5	660832,0	15,0	-0,8
United Kingdom	149100,0	104522,0	99296,0	87649,0	79510,0	-11,7	-9,3
Total CAEF	3.683.049	2.875.882	3.317.701	3.320.479	3.336.878	0,1	0,5

Table 29

Production value in Mio. € - Light and ultralight castings

Country	2019	2020	2021	2022	2023	2022/21	2023/22
						in %	in %
Austria							
Belgium							
Bulgaria			26,0	28,6	28,6	10,0	0,0
Croatia							
Czech Rep.							
Denmark							
Finland	21,3	18,2	25,2	31,3	32,1	23,9	2,7
France							
Germany a)	4705,2	3933,1	4264,6	5189,0	5114,0	21,7	-1,4
Hungary							
Italy							
Norway	51,0						
Poland							
Portugal	247,0	200,6	200,3	244,1	236,0	21,9	-3,3
Slovenia							
Spain		571,0	680,0	748,0	775,0	10,0	3,6
Sweden							
Switzerland							
Türkiye	2289,4	2223,8	2374,1	3435,1	3705,2	44,7	7,9
United Kingdom							
Total CAEF	7313,9	6946,7	7570,2	9676,1	9890,9	27,8	2,2

a) foundries >50 employees

Table 30

Light and ultralight castings in t

Country	Year	Aluminium			Magnesium			general engineering	automotive industry	other	Total Production
		Sandcast and gravity die casting	Pressure die casting	Total	Sandcast and gravity die casting	Pressure die casting	Total				
Austria	2022	18.753	106.991	125.744							131.859
	2023	14.919	104.762	119.681							123.972
	in %	-20,4	-2,1	-4,8							-6,0
Belgium	2022										
	2023										
	in %										
Bulgaria	2022	390,0	5.340,0	5.730,0							5.730,0
	2023	390,0	5340,0	5730,0							5730,0
	in %	0,0	0,0	0,0							0,0
Croatia	2022			33,8							33,8
	2023			74,6							74,6
	in %			120,7							120,7
Czech Rep.	2022			87.200			400				87.600
	2023			81.900			300				82.200
	in %			-6,1			-25,0				-6,2
Denmark	2022										
	2023										
	in %										
Finland	2022	1.155	537	1.802							3.604
	2023	779	1.018	1.797							1.797
	in %	-32,6	89,6	-0,3							-50,1
France	2022										293.529
	2023										314.267
	in %										7,1
Germany	2022	304.469	392.916	703.275		13.181	13.190	8.930	613.380	94.130	716.465
	2023	316.994	408.691	731.518		9.092	9.092	6.944	645.170	182.118	740.610
	in %	4,1	4,0	4,0		-31,0	-31,1	-22,2	5,2	93,5	3,4
Hungary	2022	52.453	71.300	123.753			260				124.013
	2023	52.453	71.300	123.753			260				124.013
	in %	0,0	0,0	0			0,0				0,0
Italy	2022			681.904			3.143				685.046
	2023			684.729			2.484				687.213
	in %			0,4			-21,0				0,3
Norway	2022										
	2023										
	in %										
Poland	2022										252.008
	2023										250.000
	in %										-0,8
Portugal	2022	1.789	34.947	34.859							34.859
	2023	1.641	32.032	33.673							33.673
	in %	-8,3	-8,3	-3,4							-3,4
Slovenia	2022			55.576							55.576
	2023			0							57.912
	in %			-100,0							4,2
Spain	2022	1.592	108.930	110.522							110.522
	2023	1.366	113.252	114.618							114.618
	in %	-14,2	4,0	3,7							3,7
Sweden	2022										45.000
	2023										48.000
	in %										6,7
Switzerland	2022	2.165	10.197	12.362							12.362
	2023	2.013	10.518	12.531							12.531
	in %	-7,0	3,1	1,4							1,4
Türkiye	2022	77.303	587.869	665.173	178	580	758				665.930
	2023	75.621	584.445	660.066	156	610	766				660.832
	in %	-2,2	-0,6	-0,8	-12,3	5,2	1,1				-0,8
United Kingdom	2022			86.549			1.100				87.649
	2023			77.910			1.600				79.510
	in %			-10,0			45,5				-9,3

ZINC

Table 31

Total production in t - Zinc

Country	2019	2020	2021	2022	2023	2022/21 in %	2023/22 in %
Austria							
Belgium							
Bulgaria							
Croatia							
Czech Rep.	1000,0	800,0	900,0	900,0	800,0	0,0	-11,1
Denmark							
Finland							
France	24486,0	18879,8	20738,7	20324,2	19484,4	-2,0	-4,1
Germany	57182,2	49761,4	41095,1	28748,0	26895,0	-30,0	-6,4
Hungary	763,0	1662,0	1542,0	1576,0	1576,0	2,2	0,0
Italy	92161,0	75834,0	95088,9	88151,5	92732,4	-7,3	5,2
Norway							
Poland a)	7500,0	6000,0	6540,0	5559,0	5050,0	-15,0	-9,2
Portugal	2464,0	2165,0	2829,0	2419,0	2011,0	-14,5	-16,9
Slovenia	9665,0	7477,0	8187,0	7103,0	5073,0	-13,2	-28,6
Spain	8426,0	7304,0	7973,0	7491,0	7738,0	-6,0	3,3
Sweden							
Switzerland	1051,0	762,0	1054,0	1127,0	920,0	6,9	-18,4
Türkiye	39432,0	31644,0	42981,0	48535,7	49992,0	12,9	3,0
United Kingdom	8090,0	7300,0	7300,0	1800,0	1850,0	-75,3	2,8
Total CAEF	252220,2	209589,2	236228,7	213734,4	214121,8	-9,5	0,2

Table 32

Production value in Mio. € - Zinc

Country	2019	2020	2021	2022	2023	2022/21 in %	2023/22 in %
Austria							
Belgium							
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland							
France							
Germany a)							
Hungary							
Italy							
Norway							
Poland							
Portugal	19,5	19,1	19,2	19,0	16,0	-0,5	-16,0
Slovenia							
Spain		56,0	63,0	69,0	75,0	9,5	8,7
Sweden							
Switzerland							
Türkiye	164,3	115,9	126,1	239,0	257,8	89,6	7,9
United Kingdom							
Total CAEF							

a) included in Table 26

Table 33

Zinc in t

Country	Year	Pressure die casting	general engineering	automotive industry	other	Total Production
Austria	2022					
	2023					
	in %					
Belgium	2022					
	2023					
	in %					
Bulgaria	2022					
	2023					
	in %					
Croatia	2022					
	2023					
	in %					
Czech Rep.	2021					900
	2022					800
	in %					-11,1
Denmark	2022					
	2023					
	in %					
Finland	2022					
	2023					
	in %					
France	2022					20.324
	2023					19.484
	in %					-4,1
Germany	2022		161	1.359	39.575	28.748
	2023		182	1.344	25.369	26.895
	in %		13,0	-1,1	-35,9	-6,4
Hungary	2022					1.576
	2023					1.576
	in %					0,0
Italy	2022					88.151
	2023					92.732
	in %					5,2
Norway	2022					
	2023					
	in %					
Poland	2022					5.559
	2023					5.050
	in %					-9,2
Portugal	2022		2.829			2.419
	2023		2.011			2.011
	in %		-28,9			-16,9
Slovenia	2022					7.103
	2023					5.073
	in %					-28,6
Spain	2022		3.788	3.117	1.068	7.491
	2023		2524,0	4323,0	891,0	7.738
	in %		-33,4	38,7	-16,6	3,3
Sweden	2022					
	2023					
	in %					
Switzerland	2022					1.127
	2023					920
	in %					-18,4
Türkiye	2022		8.086	8.406	26.489	48.536
	2023		11.743	9.485	28.764	49.992
	in %		45,2	12,8	8,6	3,0
United Kingdom	2022					1.800
	2023					1.850
	in %					2,8

OTHER ALLOY CASTINGS

Table 34

Total production in t - Other alloy castings

Country	2019	2020	2021	2022	2023	2022/21 in %	2023/22 in %
Austria							
Belgium							
Bulgaria							
Croatia	0,1	0,1	0,1	0,2	0,2	100,0	0,0
Czech Rep.							
Denmark	112,0						
Finland							
France	2486,0	2180,3	2395,0	2315,2	2224,4	-3,3	-3,9
Germany	5,2	19,0					
Hungary	86,0	99,0	77,0	63,0	63,0	-18,2	0,0
Italy	1324,0	1235,0	880,5	515,0		-41,5	-100,0
Norway							
Poland	3000,0	2400,0	2616,0	2224,0	2100,0	-15,0	-5,6
Portugal							
Slovenia			2374,0	2595,0		9,3	-100,0
Spain	1502,0	683,0	719,0	736,0	169,0	2,4	-77,0
Sweden							
Switzerland							
Türkiye							
United Kingdom							
Total CAEF	8515,2	6616,4	9061,5	8448,2	4556,6	-6,8	-14,6

WORLD PRODUCTION

Table 35

World production 2021, selected countries - Iron and Steel castings in t

Country	Iron castings	Nodular iron castings	Malleable iron castings	Steel castings	Total
Austria	37,100	104,800		10,300	152.200
Belgium	44,500	4,500		5,300	54.300
Brazil *	1,148,123	468,952		269,512	1.886.587
Canada ****	330,841			90,091	420.932
China	22,550,000	15,950,000	600,000	6,600,000	45.700.000
Croatia *	19,465	6,161		120	25.746
Czech. Rep.	140,000	41,000		44,500	225.500
Denmark **	28,900	58,100			87.000
Finland	20,600	25,500		5,700	51.800
France	503,900	665,000		43,100	1.212.000
Germany	1,873,700	1,140,900		143,800	3.158.400
Hungary	16,300	57,200		1,700	75.200
India	8,623,822	1,259,850	50,000	1,049,827	10.983.499
Indonesia	94,680	156,360		49,872	300.912
Italy	616,200	385,900		56,800	1.058.900
Japan	1,831,186	1,339,165	29,834		3.200.185
Korea (Republic of)	850,200	670,100		145,400	1.665.700
Mexico ***	816,160	560,270		336,250	1.712.680
Norway **	8,800	22,300			31.100
Pakistan **	181,000	24,540		48,750	254.290
Poland	392,400	135,160		43,600	571.160
Portugal	39,699	76,586		4,404	120.689
Romania	12,832	1,349		2,864	17.045
Russia **	2,184,000		1,134,000		3.318.000
Slovenia	73,236	44,315	3,100	3,808	124.459
Spain	322,800	608,800		69,200	1.000.800
Sweden	141,700	47,500		21,200	210.400
Switzerland	8,600	12,900		2,400	23.900
Taiwan	642,411	212,354		69,387	924.152
Türkiye	920,700	1,108,100		279,300	2.308.100
United Kingdom	128,420	195,600		35,373	359.393
United States *	7,616,824				7.616.824

Source: Modern Casting, data can differ from CAEF data

* 2020 Results

** 2019 Results

*** 2017 Results

**** 2015 Results

Table 36

World Production 2021 selected countries - Non-ferrous metal castings in t

Country		Copper	Aluminum	Magnesium	Zinc	Others	Total
Austria			127,971				127.971
Belgium							
Brazil	*	20,524	160,464	4,534	1,064		186.586
China		900,000	7,200,000			250,000	8.350.000
Croatia	*	202	65,606			131	65.939
Czech. Rep.		18,000	89,000	400	900		108.300
Denmark	**	1,188	2,224			112	3.524
Finland		2,508	3,604				6.112
France		17,705	299,016		20,739	2,395	339.855
Germany		48,425	701,118	15,498	41,095		806.136
Hungary		701	119,026	278	1,542	77	121.624
India			1,465,158				1,465.158
Indonesia			65,919			320,800	386.719
Italy		51,947	727,254	5,283	95,089	881	880.454
Japan		59,585		374,042	16,927	904,440	1.354.994
Korea (Republic of)		23,500	620,400	10,000			653.900
Mexico	***	215,500	832,770		79,500	15,200	1,142.970
Norway	**		6,526				6.526
Pakistan	**	14,200	21,200			2,730	38.130
Poland		5,232	296,480		6,540	2,616	310.868
Portugal		14,699	33,050		2,829		50.578
Romania		1,143	49,393	2,000	250	13	52.799
Russia	**	117,600	588,000	75,600		100,800	882.000
Slovenia		1,005	52,692		8,187	2,374	64.258
Spain		12,807	106,185		7,973	719	127.684
Sweden	*		56,400				56.400
Switzerland		2,039	11,726		1,054		14.819
Taiwan		29,997	527,946	5,375			601.102
Türkiye		33,388	578,113	1,011	42,981		655.493
United Kingdom		7,885	97,396	1,900	7,300		114.481
United States	*	304,279	1,425,120		47,786	354,802	2.131.987

Source: Modern Casting, data can differ from CAEF data

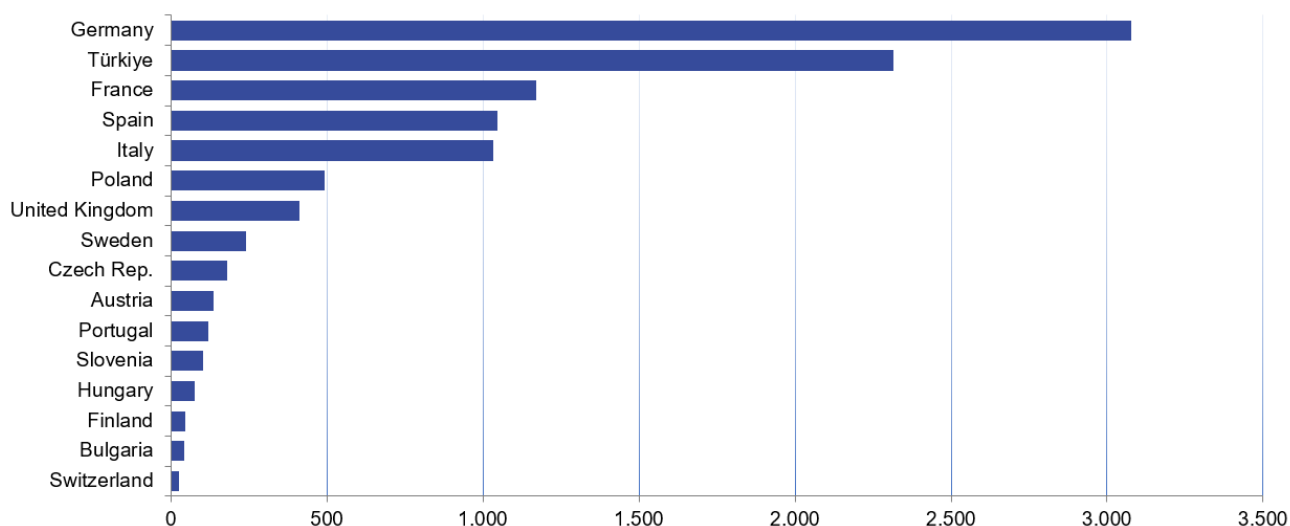
* 2020 Results

** 2019 Results

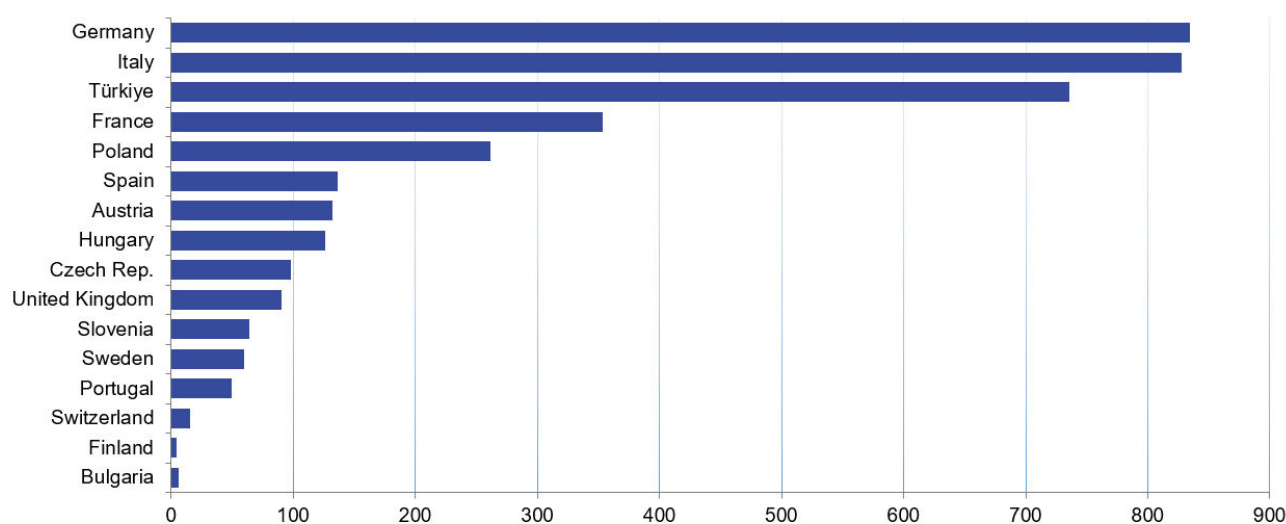
*** 2017 Results

GRAPHS

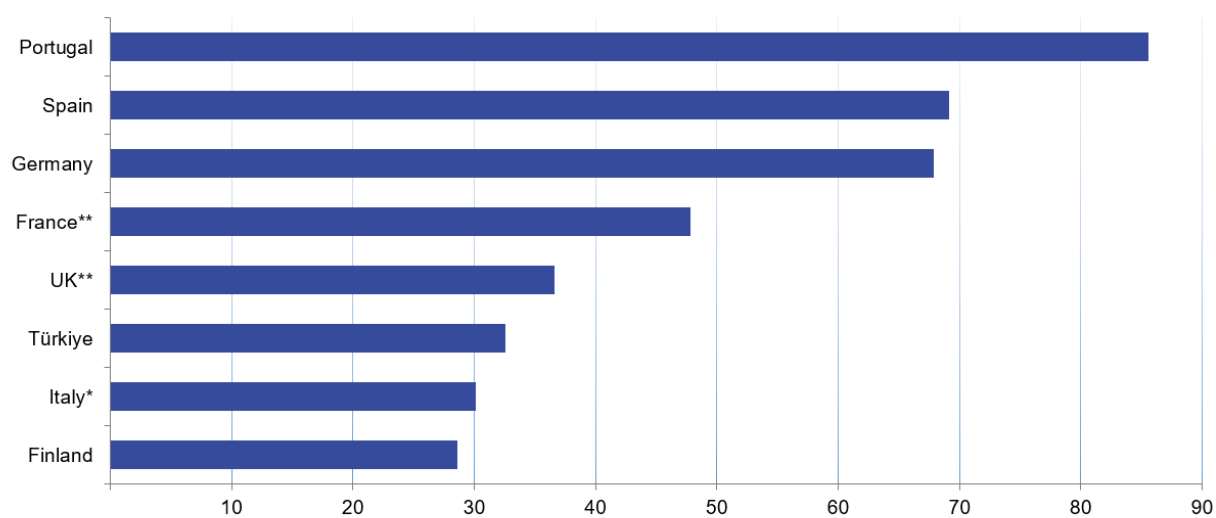
Production of Iron, Ductile Iron and Steel Castings in the European Foundry Industry 2023 (in 1.000 t)



Production of Non-Ferrous Metal Castings in the European Foundry Industry 2023 (in 1.000 t)

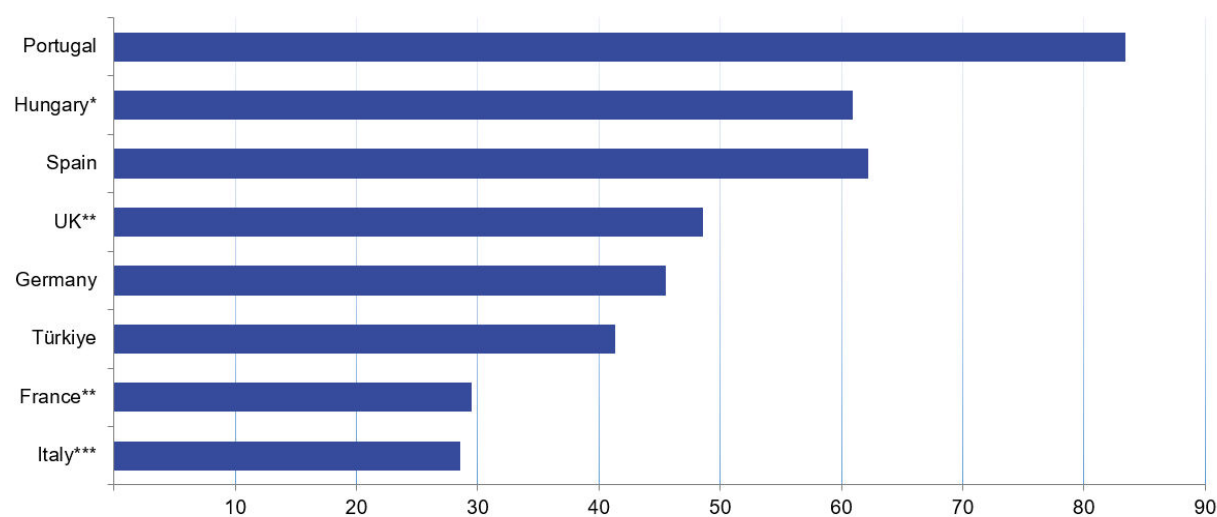


Iron Castings for the Vehicle Industry National Production Share 2023 (in %)



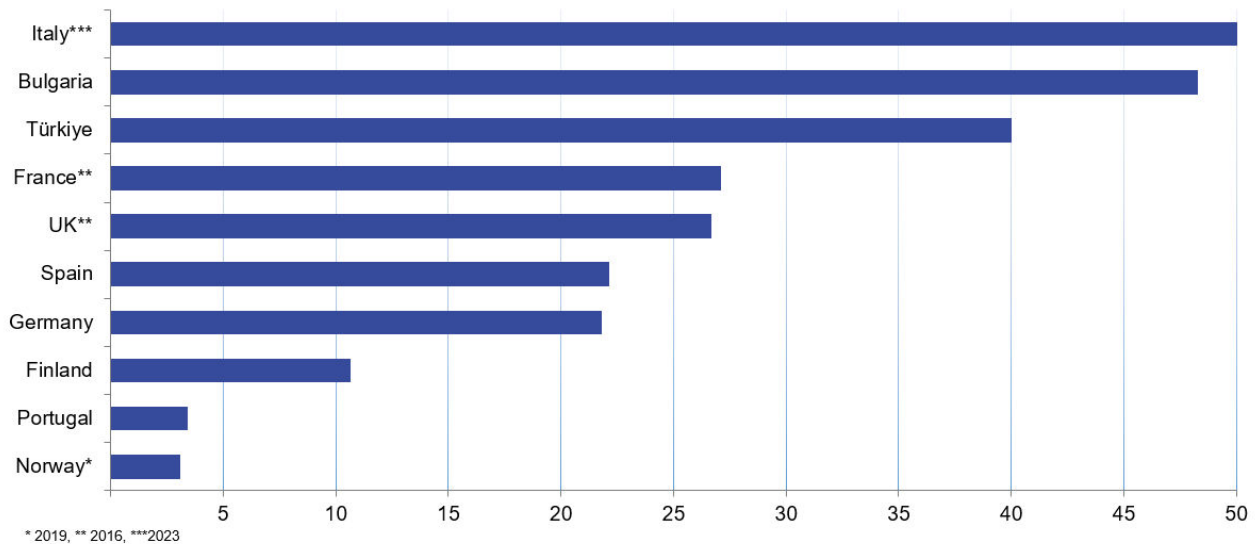
* 2022
** 2016

Ductile Iron Castings for the Vehicle Industry National Production Share 2023 (in %)

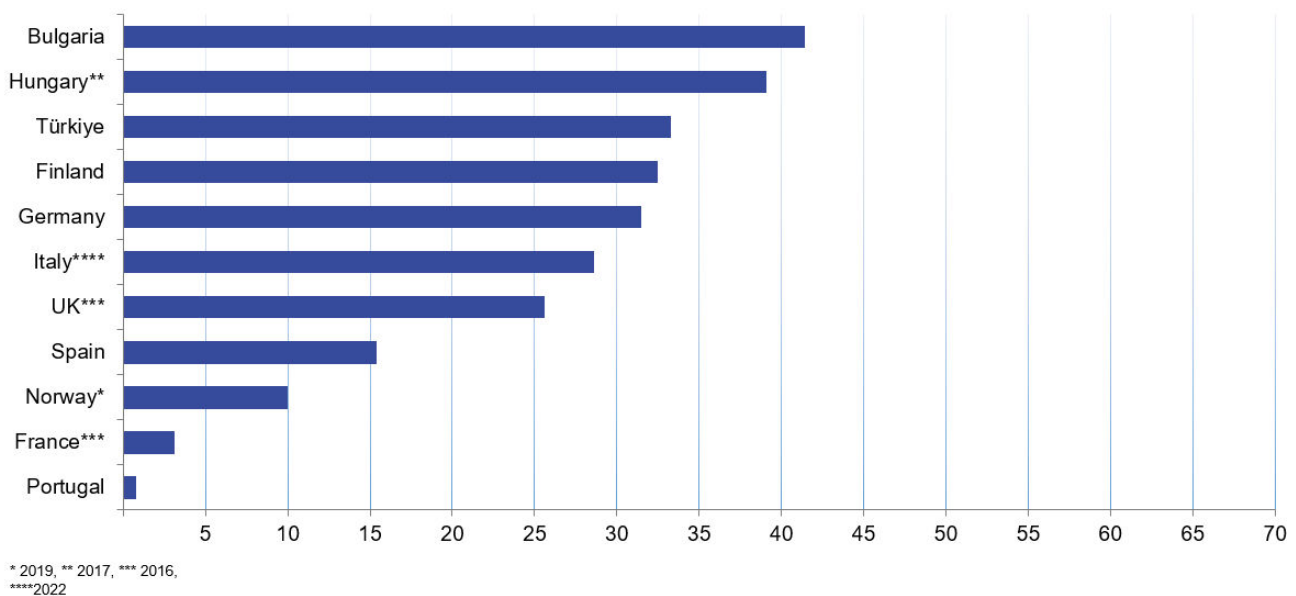


* 2017, ** 2016,
*** 2022

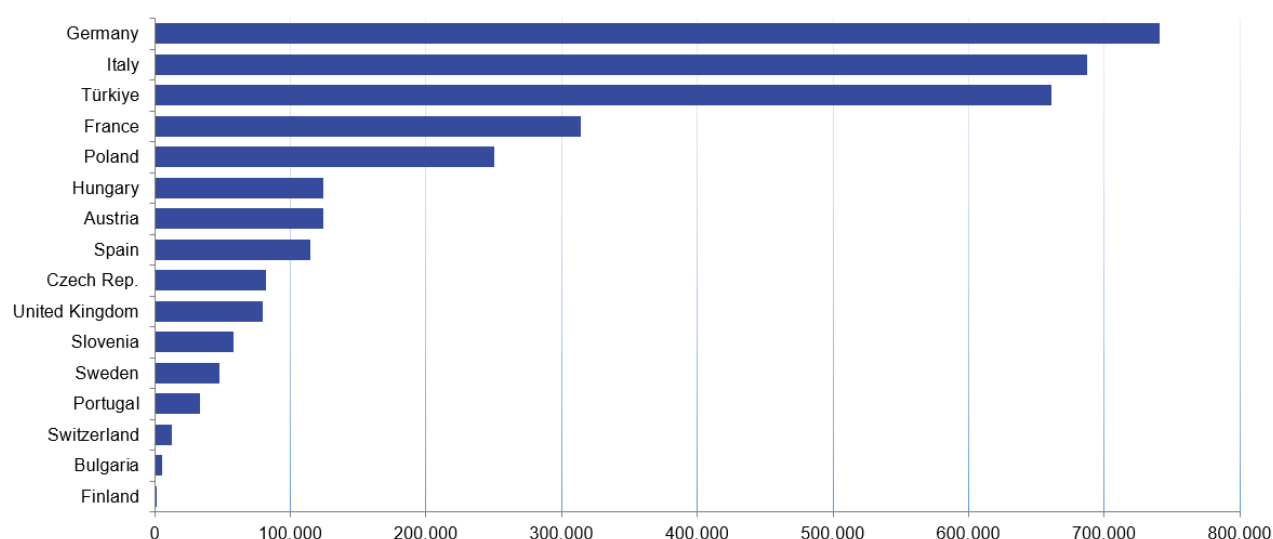
Iron Castings for Engineering Plant and Machinery National Production Share 2023 (in %)



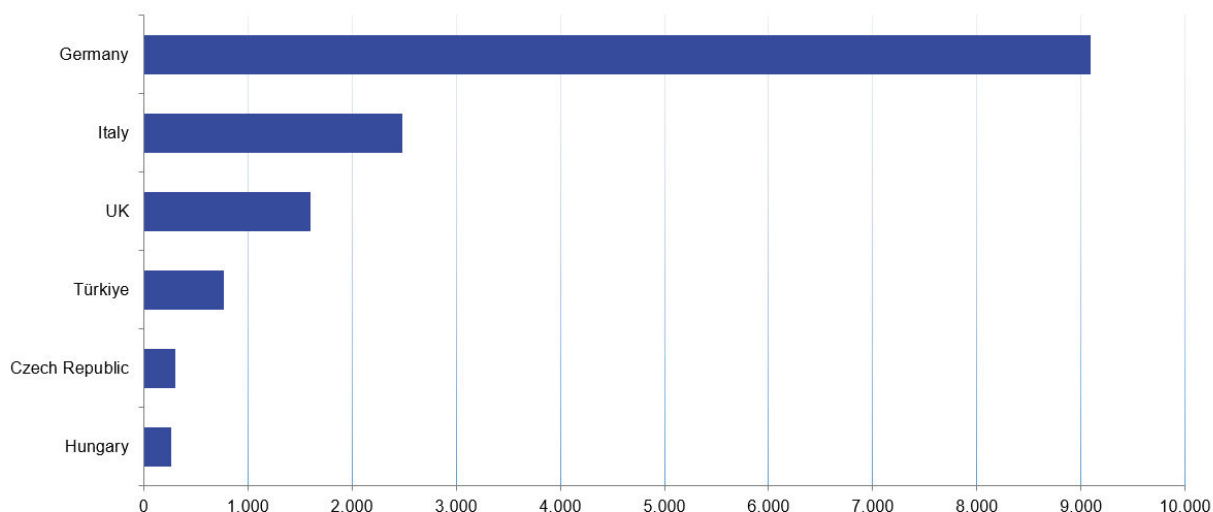
Ductile Iron Castings for Engineering Plant and Machinery National Production Share 2023 (in %)



Production of Light and Ultralight Castings in the European Foundry Industry 2023 (in t)



Major Producers of Magnesium Castings in the European Foundry Industry 2023 (in t)



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