
CAEF
The European
Foundry Association
2020

Contents

	Page
Preface	2
Total Survey	3
Reports of the Countries	
Austria	12
Belgium	15
Czech Republic	19
Finland	21
France	24
Germany	27
Hungary	34
Italy	36
Norway	43
Poland	45
Portugal	47
Slovenia	50
Spain	53
Sweden	56
Switzerland	58
Turkey	59
United Kingdom	67
Tables	
Iron, Ductile Iron and Steel Castings	75
Iron Castings	79
Ductile Iron Castings	84
Steel Castings	87
Non-Ferrous Metal Castings	92
Copper Alloy Castings	95
Light and Ultra-light Castings	98
Zinc	101
Other Alloy Castings	104
World Production	106
Graphs	**109**

Preface

Once again, the CAEF - The European Foundry Association - Commission for Economics & Statistics has compiled a statistical annual entitled "The European Foundry Industry 2020" from national reports and statistical material gathered from its member countries. The main tables were supplemented by information from European foundry nations being non-members of CAEF as far as data has been available.

The publication thus presents an authentic statistical picture of the European foundry industry. All the same, data in some categories, particularly those regarding output values, have remained incomplete. Despite those inadequacies the annual report published by the Commission for Economics & Statistics remains the most comprehensive EU-wide survey of our industry.

The Commission Economics and Statistics wishes to express its gratitude to all those CAEF member associations representatives who helped in preparing these reports and figures.

Düsseldorf, September 2021

CAEF - The European Foundry Association

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TOTAL SURVEY

The European Foundry Association

The European Foundry Industry in 2020

The Economy and the Casting Customer Industries

The Macro-economic Situation at the end of the year 2020

The year 2020 was dominated by the Covid 19 pandemic. The world has experienced its biggest crisis of the post-war period and has not yet overcome it in 2021. The pandemic, meanwhile, overshadows further structural upheavals that pose forward-looking challenges for the foundry industry.

Although the pandemic has shocked the entire world economy and thus also affected global castings production, the impact varies from region to region. The pandemic originated in China, making the People's Republic the first country to impose a comprehensive lockdown. The central government's measures to contain the number of infections were ultimately successful. Accordingly, China's industry has been showing signs of recovery since the middle of 2020. Besides Turkey, China was the only major economic power to record positive GDP growth of 2.3% in the crisis year[1]. Meanwhile, the infection figures in the USA rose to sad record levels[2]. The economy slumped relatively mildly with a minus of 3.5%. In addition to the pandemic, the year was also trendsetting for the USA because Donald Trump was unable to defend his office as US president and finally had to step down at the beginning of 2021 after temporary riots to make way for his Democratic successor, Joe Biden. As the former president sought open trade conflict with China in the past and the world's two largest economies hit each other with penalty tariffs and economic policy retaliation, which also had a negative impact on the European foundry industry, Biden is seen as more predictable. Nevertheless, a fundamental turn back from protectionist measures is considered unlikely. However, the horror scenario of the export-oriented European industry of tariffs on vehicles is becoming less likely. The return of the USA to the Paris climate agreement is also generally viewed positively. This is associated with the hope of international cooperation in the fight against climate change. It will be crucial for the European foundry industry, for example, that its competitiveness is not further jeopardised by very ambitious climate policy targets under the EU Green Deal published at the end of 2019, while at the same time other nations are cutting costs on climate protection measures. Meanwhile, the transformation of European industry has been accelerated by the pandemic, particularly in the areas of digitalisation, renewable energies, and e-mobility. It has not become any easier for foundries to meet the complex challenges. The 6.1% slump in EU GDP was significantly higher than in China or the USA due to the dynamic infection and the associated restrictions[3]. The GDP of the CAEF countries even dropped by 6.4%. The fact that unemployment in the CAEF area only rose by around 0.4 percentage points to 7.7% in 2020 is due to extensive government aid measures in most of the states. Nevertheless, the EU's poor vaccination management slowed down the recovery in Europe.

[1] International Monetary Fund (2021): „World Economic Outlook – Managing Divergent Recoveries“, Washington DC., USA.
[2] John Hopkins University (2021): „Covid-19 Dashboard”, Coronavirus Resource Center, Baltimore, USA (11.05.2021).
[3] International Monetary Fund (2021): „World Economic Outlook – Managing Divergent Recoveries“, Washington DC., USA

Table 1: Forecast 2021/2022

Country	Weighting In %		Gross Domestic Product Growth Rate in %			Consumer Prices Growth Rate in %			Unemployment Rate In %		
	Population	GDP	2020	2021	2022	2020	2021	2022	2020	2021	2022
Austria	1,6	2,3	-6,6	3,5	4,0	1,4	1,6	1,7	5,3	5,5	5,3
Belgium	2,0	2,8	-6,4	4,0	3,1	0,4	1,7	1,9	5,6	6,8	6,6
Bulgaria	1,2	0,4	-3,8	4,4	4,4	1,2	1,0	2,0	5,2	4,8	4,4
Croatia	0,7	0,3	-9,0	4,7	5,0	0,3	0,7	1,2	9,2	9,4	9,0
Czech Republic	1,9	1,3	-5,6	4,2	4,3	3,2	2,3	2,0	2,7	3,4	3,2
Denmark	1,0	1,9	-3,3	2,8	2,9	0,3	1,1	1,4	5,6	5,6	5,5
Finland	1,0	1,5	-2,9	2,3	2,5	0,4	1,4	1,5	7,8	8,6	7,9
France	11,5	14,0	-8,2	5,8	4,2	0,5	1,1	1,2	8,2	9,1	9,2
Germany	14,7	20,5	-4,9	3,6	3,4	0,4	2,2	1,1	4,2	4,4	3,7
Hungary	1,7	0,8	-5,0	4,3	5,9	3,3	3,6	3,5	4,1	3,8	3,5
Italy	10,7	10,1	-8,9	4,2	3,6	-0,1	0,8	0,9	9,1	10,3	11,6
Lithuania	0,5	0,3	-0,8	3,2	3,2	1,1	1,5	1,9	8,9	8,4	7,6
Netherlands	3,1	4,9	-3,8	3,5	3,0	1,1	1,4	1,5	3,8	4,9	4,7
Norway	1,0	1,9	-0,8	3,9	4,0	1,3	2,2	2,0	4,6	4,3	4,0
Poland	6,7	3,2	-2,7	3,5	4,5	3,4	3,2	2,5	3,2	4,9	4,5
Portugal	1,8	1,2	-7,6	3,9	4,8	-0,1	0,9	1,2	6,8	7,7	7,3
Slovenia	0,4	0,3	-5,5	3,7	4,5	-0,1	0,8	1,5	5,1	5,4	5,0
Spain	8,3	6,9	-11,0	6,4	4,7	-0,3	1,0	1,3	15,5	16,8	15,8
Sweden	1,8	2,9	-2,8	3,1	3,0	0,7	1,5	1,3	8,3	8,7	8,4
Switzerland	1,5	4,0	-3,0	3,5	2,8	-0,7	0,1	0,3	3,1	3,5	3,4
Turkey	14,9	3,9	1,8	6,0	3,5	12,8	13,6	11,8	13,1	12,4	11,0
UK	11,9	14,6	-9,9	5,3	5,1	0,9	1,5	1,9	4,5	6,1	6,1
CAEF[4]	**100**	**100**	**-6,4**	**4,5**	**3,9**	**1,0**	**2,0**	**1,8**	**7,7**	**8,3**	**8,0**

Source: International Monetary Fund, World Economic Outlook Database, April 2021

The Economic Situation in the Major Casting Customer Industries

Vehicle construction

The international passenger car markets were hit hard by the Covid-19 pandemic in 2020. Nearly all over the world sales decreased significantly. The European market, however, suffered by far the largest losses. Even a variety of purchase incentive programmes, which were often limited to vehicles with alternative engines, could only partially prevent sales figures from collapsing even further. The reason for the deep cuts is that the vehicle markets in 2020 faced major problems on both the supply and demand sides. On the one hand, access to sales areas and direct customer contact was restricted for several weeks in various countries, and in addition, a reservation on the part of consumers with regard to financially larger purchases was felt, especially in spring. On the other hand, there were problems in the international supply chains due to the travel regulations and the associated restrictions. At the same time, quarantine rules and other factors such as childcare have had a negative impact on production.

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

In Europe, almost 12.0 million passenger cars were newly registered in 2020, which was 24.3% less than in the previous year. All the five largest markets recorded double-digit falls. In Germany new car registrations lost 19%. Even worse sales figures in Germany were only prevented by a pull-forward effect in the context of the VAT reduction that expired at the end of 2020. In fact, the authorities in Germany registered more new registrations in the final month than ever before in December. Sales in France were down by one quarter. New registrations lost almost one third in Italy (-28%) and the United Kingdom (-29%). The Spanish market decreased most by 32%. All other countries in the European market finished the year 2020 with a negative result, too. Turkey was the only major country with a positive sign, that was however caused by extraordinary statistical effects.

In the US, the light vehicle market (passenger cars and light trucks) finished 2020 with nearly 14.5 million vehicles sold (-15%). China has largely managed to leave the corona pandemic and its serious consequences for vehicle behind it. Rapid recovery reduced the shrinkage in 2020 to 6 percent (19.8 million units). In 2020 the Japanese new car market totalled 3.8 million passenger cars, some 11% below the previous year's result. Russia's light vehicle sales fell by 9% last year, to 1.6 million units. In India the passenger car market also recorded a significant decrease in 2020 of 18% and Brazil even 27%.

Although it was already foreseeable at the end of 2020 that the crisis in the international vehicle market would not be completely overcome by an easing of the demand situation, significant problems in the procurement of semiconductors dispelled hopes of a promising year in 2021 at an early stage already. As in 2020, there will be production shutdowns and short-time work among various manufacturers in 2021. The production forecasts have therefore already been adjusted downwards in the first half of 2021 and are only slightly above the figures for 2020. In the wake of the pandemic, the transformation of the vehicle industry towards alternative drives has also accelerated. In this context, vehicle manufacturers and governments in Europe have recently significantly increased their ambitions to replace combustion engines.

Mechanical engineering

Machinery and equipment manufacturers worldwide suffered the effects of the pandemic. The biggest drop in production was in the EU's domestic market, since EU machine production decreased by around 13% in 2020. This is the most significant decline since the financial crisis in 2009. Due to the diversity of the mechanical engineering industry, individual sectors have been quite differently affected by the negative impacts. While the casting-intensive machine tool industry is one of the biggest losers with production declines of around 30% due to the sales crisis and the ongoing transformation in vehicle manufacturing, the manufacturers of agricultural machinery were able to benefit from full order books even during the pandemic and close the year in the black.

While the Japanese (-12%) and the US-American (-9%) machinery and equipment manufacturers also clearly missed the previous year's figures, the manufacturers in China managed to increase their production by 6% despite the crisis. Among other things, they benefited from extensive infrastructure projects.

There are signs of a solid recovery in European machinery and equipment manufacturing in 2021. Although the first half of the year was promising, it will probably take until 2022 before the pre-crisis level is reached again.

Building industry

The decline in construction volume in 2020 was less than before expected with a slump of 5.1% in the 19 Euroconstruct countries. Nevertheless, this means drastic declines in total construction output in almost all EC countries - apart from Denmark, Finland, Portugal and Sweden. The construction industry in the Nordic countries was more resilient to the pandemic, with positive growth rates in several countries. This contrasts with a negative growth trend in the Eastern European countries, where the

Czech Republic and Poland came off somewhat more lightly. The picture in continental and southern Europe is very heterogeneous. While construction output plummeted in France, growth in Germany was only just below zero, as it was in Switzerland. Moderate losses were recorded in Austria and Belgium. Portugal was also able to decouple itself from the negative dynamics in neighbouring Spain.
Against the backdrop of significantly more favorable economic conditions in the EC-19, the construction industry is benefiting from an overall rapid economic recovery in 2021. The forecast of a 3.8% growth in the industry consists of different developments in the individual countries, some of which vary greatly. From a sectoral perspective, civil engineering, which has already shown significantly above average growth momentum in recent years, has the most promising growth prospects in the years until 2023. Non-residential construction, which was most strongly hit by the crisis, exhibits a relatively weak recovery path in the coming years. Residential construction, on the other hand, will continue to deliver stable growth rates but the growth dynamic drops noticeably after 2021.

Steel industry

Global crude steel production reached 1,878 million tonnes in 2020, which was almost exact the same production volume like in the year before.
The EU produced 138.8 million tons of crude steel in 2020, a decrease of 11.8% compared to 2019. Germany produced 35.7 million tons of crude steel in 2020, down 10.0% on 2019. Turkey's crude steel production for 2020 was 35.8 million tons, up by 6.0% on 2019.

Asia produced 1,374.9 million tons of crude steel in 2020, an increase of 1.5% compared to 2019. China's crude steel production in 2020 reached 1,053.0 million tons, up by 5.2% on 2019. China's share of global crude steel production increased from 53.3% in 2019 to 56.5% in 2020. India's crude steel production for 2020 was 99.6 million tons, down by 10.6% on 2019. Japan produced 83.2 million tons in 2020, down 16.2% on 2019. South Korea produced 67.1 million tons, down 6.0% on 2019.

The United States produced 72.7 million tons in 2020, down 17.2% on 2019. Russia is estimated to have produced 73.4 million tons in 2020, up 2.6% on 2019. Ukraine produced 20.6 million tons in 2020, down 1.1% on 2019. The Middle East produced 45.4 million tons of crude steel in 2020, an increase of 2.5% on 2019. Iran is estimated to have produced 29.0 million tons in 2020, up 13.4% on 2019. Annual crude steel production for South America was 38.2 million tons in 2020, a decrease of 8.4% on 2019. Brazil produced 31.0 million tons in 2020, down by 4.9% compared to 2019.

The pandemic has accelerated some key trends, which will bring about shifts in steel demand. The steel industry will see rapid developments through digitisation and automation, infrastructure initiatives, reorganisation of urban centres and energy transformation.

The Foundry Industry

In 2020, the iron and steel foundries of the CAEF member states produced 9.1 million (m.) tons of castings. Compared to the year before, this corresponds to a 19.8% decrease in production weight. The six countries that dominate the industry in terms of weight, namely Germany, Turkey, France, Spain and Italy, account for 79.8% of the production of ferrous metal castings. The production decreased in all countries with double digits compared to the previous year. The exceptions are Turkey and Hungary. While in Turkey the production was 4.4% lower than in 2019, Hungary showed even a positive sign with a plus of 0.3%.

In 2020, non-ferrous metal foundries in the CAEF member states booked a production decrease of 19.2% to roundabout 3.3 m. tons. The countries that dominate the production of non-ferrous metal castings, namely Germany and Italy, account for 43.2% of the total volume of non-ferrous metal castings produced in the CAEF member states. In both cases, production declined at an above-average rate (-24.5% and -20.3%) compared to the other CAEF countries.

The number of employees in iron and steel foundries increased in Italy, Slovenia and Turkey. All in all, however, the employment of foundries located in CAEF member states decreased by 7.5% to 130 700 people.

In 2020 the non-ferrous metal sector was also dominated by negative employment trends. Compared with the figures of the ferrous foundries fewer people were affected by this. In the End of 2020 113 000 people worked for European foundries. Compared to 2019 the number of employees decreased by 4.6%.

The share of cast iron with lamellar graphite in the output total of iron and steel castings was 48.5%, a slightly smaller share than in the year before. Correspondingly, the share of ductile cast iron logged (43.9%). The share of steel sector was slightly higher (7.5%).

The production of castings made of non-ferrous metal alloys is still dominated by light metals. The share was 87.0%. Furthermore, the share of copper alloys holds the level of round about 5.6%. Therefore, the share of components made of zinc alloys was 6.3%.

From the data available it appears that the export quota of the iron and steel foundries increased slightly from 39.5% last year to 42.3% in 2020. Calculation base is the foreign trade report of eight member countries. Germany, the country that dominated the export trade in castings in the past experienced the greatest decline with a volume of more than 1.05 million tons (-32.7%). Turkey reported an export volume of almost 0.98 million tons (-9.7%) and therefore is again the second biggest export nation of iron and steel castings. Spain exported a volume of 0.62 million tons (-16.7%) and is placed the third place. The fourth place is booked for Italy (386 600 tons, -20.8%). French foundries almost exported the same volume (384 300 tons) which equals a decline by 14.2%.

If we consider only those CAEF member states with current figures for the previous year, the value of the iron and steel castings produced decreased by 9.5%, in doing so the weight of castings fell by 19.8%.

From the data that is available on the production value of the non-ferrous metal sector a year-on-year comparison shows a decline of 15.6%. It appears that the weight of castings produced was 19.2% lower.

All countries with missing data were excluded from the calculations.

The Situation in the Casting Material Sectors

Iron

At 4.4 million tons, the output of the CAEF member states was down by 21.1%. A growing production was only logged for Turkey (0.5%). Except Switzerland and Finland all other countries had to deal with negative growth rates in double digits for the year 2020. 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. For the motor vehicle industry, the highest absorption rates were reported from Portugal (83.5%), Germany (66.5%) and Turkey (37.3%) respectively. For the mechanical engineering in industry the highest shares in the output were posted for 2020 by Italy (53.6%), Turkey (34.5%), and Finland (28.9%).

The number of persons employed in iron foundries (incl. ductile cast iron) increased in Italy and Turkey and was stable in Switzerland. In all other countries employment decreased, leading to a 7.6% decline overall.

Ductile Cast Iron

The producers of ductile cast iron reported a decrease of output by 19.4% to 4.0 million tons.

Hungary only logged an upturn in production (4.2%). Apart from Turkey (-8.5%) all other countries closed the year 2020 with a double-digit decline.

Cast iron with spheroidal graphite 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 87.0%, Turkey at 45.9%, and Germany at 44.6%. The mechanical engineering industry holds the highest shares in output in Finland (90.5%), Italy at 54.7%, and Germany at 33.2%. Unfortunately, it is impossible to present the share of the building industry.

Steel

In the year 2020 the output of steel castings decreased by 13.2% to 686 000 tons. Turkey, the leading producer since 2018, logged a stable production volume compared to the year before. For Germany, second in line, the production decreased by 22.6%. An increased production was only reported for Switzerland (8.7%). Production in all other countries decreased due to the pandemic.

In those member countries for which data for a year-on-year comparison was available, the value of the output of steel casting components decreased by 9.0%.

The number of persons employed in steel foundries was stable in Switzerland, and Italy. In Turkey and Spain, the number of employees increased, whereas the number of persons employed decreased in Germany, Finland, Portugal, and Poland. At the end of 2020 nearly 22 100 people were employed in European steel foundries.

Non-ferrous metal castings

The output of non-ferrous metal casting components in the CAEF member countries decreased by 19.2% to 3.3 million tons. As before, the non-ferrous metal sector is dominated by Germany, Italy, Turkey, France, and Poland. The share of the first three countries equals 58.0% in 2020. In Belgium only an increasing production volume was logged. Hungary reported a slightly negative production (-1.9%), while all other CAEF member countries showed a double-digit decrease.

Traditionally, the production of non-ferrous metal castings is dominated by light metals. The motor vehicle industry is the foremost customer. In the year 2020 the output of light metal castings (aluminium and magnesium) decreased by 21.7% compared to 2019, reaching nearly 2.9 million tons. Together, Germany, Italy and Turkey, the three major producers, account for 58.0% of the light-metal castings. The production for these leading countries went down by 33.4% for Germany, by 20.7% for Italy and 10.7% for Turkey. There was not a single CAEF country reporting growth numbers in 2020. Only Hungary (-2.8%) almost produced as many tons of light and ultralight castings as last year. Among the light metal alloys, magnesium plays a subordinate role in terms of output weight. Germany is the major producer with 20 500 tons followed by Italy (3 700 tons) and the United Kingdom (2 000 tons).

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 2020 the level decreased by 29.5%. The reported volume in 2020 reached a level of almost 185 500 tons. Because of the missing data of some countries it is difficult to estimate the real market volume. Hungary and Spain recognised a growth rate for production, while the rest reported significant decrease.

The output of zinc castings fell by 16.9% with a volume of nearly 209 600 tons. Italy, Germany, and Turkey are the major producers, together holding a share of 75.0% in output total. A positive production was logged for Italy and Hungary. All other countries reported decreasing production volume in 2020.

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.

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

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REPORTS OF THE COUNTRIES

Economic Situation 2020 and Outlook 2021

Among the approximately 270 000 Austrian trade and industry companies there are 3 500 industrial enterprises, a share of only 1.3%. However, these 1,3% of all companies generate one quarter of the total gross value added and 39.1% of the production value of trade and industry (source: Statistics Austria, performance and structure survey). The enterprises pertaining to the trade associations of the high-value branches, such as the metal technology industry, the electrical and electronics industry, as well as the chemical industry, account for 17% of the production value and 13% of the added value of the total Austrian trade and industry.

In 2020, the Austrian industry obtained a preliminary production value of 153.7 billion EUR (source: Statistics Austria, special evaluation according to the classification of the Austrian Economic Chamber, preliminary results). The Austrian industry managed to overcome the period of decline and stagnation of 2012 - 2016 with the boom years 2017 - 2019; however restrictions due to the COVID19-pandemic affected the industrial engine in 2020. Even in times of crisis the industry remains one of the main pillars of the domestic economy. In 2020, industrial production dropped by 20 billion EUR, i.e. 11.5% compared to the previous year. For the sake of comparison: the production decline due to the financial and economic crisis between 2008 and 2009 amounted to 23.3 billion EUR, i.e. -16.8%. The impact of the coronavirus pandemic in 2020 brought about the worst downturn of the industrial production since 2009. In 2020, the industrial order intake adjusted for cancellations amounted, according to preliminary results of Statistics Austrias, to 96.1 billion EUR, i.e. 8.2 billion EUR and 7.9% less than in the preceding year.

Compared to the four assessments of 2020, which predicted especially negative trends of production and incoming orders, the business outlook prepared by the industrial section of the Austrian Economic Chamber for the first quarter of 2021 features relatively harmless trends, even if they are negative for some of the trade associations.

Whereas the electrical and electronics industry, the metal technology industry, the food and beverage industry, as well as the textile, clothing, shoe and leather industry anticipate slightly falling production expectations for the first quarter of 2021 compared to 2020, the automotive industry reckons with a small increase (between 3% and 10%). The order situation is mixed: the automotive, chemical and wood industries expect a slight increase, whereas the four mentioned trade associations with slightly negative production expectations anticipate a similar trend for incoming orders in the first quarter of 2021. The glass sector expects a more than 10% decline for production and incoming orders; this applies also to employment.

Furthermore, four of the surveyed trade associations (the metal technology, automotive, mining and steel, as well as textile, clothing, shoe and leather industries) expect a lower employment in the 1st quarter of 2021 than in the corresponding period of the previous year. The other nine associations of the surveyed sample expect no major changes in the staff of their member companies.

The foundry industry in particular is directly affected by the extremely volatile trend of the automotive industry. However the situation has been steadied in this field. According to the recent flash survey of April our foundry companies work with a capacity utilization of 88% and generally expect a small production increase, compared to last year. This increase should amount to about 10%, similar to other sectors of the metal technology industry. An easing of the COVID19-situation might bring about a positive surprise in the second half of the year.

Table 1: WIFO Forecast 03-2021 (in %)

	2021	2022
GDP	2.3	3.4
Gross capital investment	4.0	4.0
Goods production, added value	4.8	4.0
Exports of goods	2.8	7.2
Inflation	1.8	1.8

Source: BSI, BG Foundry Industry, Association of the Metal Technology Industry, April 2021

Situation of the foundry industry

According to our own survey, production, sales and employment declined in 2020. Total production amounted to about 256 165 tons in 2020, i.e. a decline of -15.5% over 2019. Total sales of the branch dropped by -15.0% to a volume of about 1.19 billion EUR. Iron castings registered in 2020 a total production volume of 134 728 tons (-15.0%). Sales figures dropped by -11.4% to about 382 million EUR. The production volume of ductile cast iron amounted to 91 726 tons, i.e. a decline of -12.4 % over the volume of 2019. Steel castings also fell to 9,601 tons (i.e. a decline of -16.1% compared to 2019). Production of grey castings declined by -21.1% compared to 2019 and reached a volume of 33 401 tons. Non-iron castings registered a production decline of -16.1%; sales went down by -16.6%.

Table 2: Foundry Production

	Production in t		Change	Value in 1000 €		Change
	2020	2019	in %	2020	2019	in %
Grey castings	33 401	42 340	-21.1			
Ductile cast iron (incl. malleable iron)	91 726	104 730	-12.4			
Steel castings	9 601	11 444	-16.1			
Iron castings	**134 728**	**158 514**	**-15.0**	**382 445**	**431 824**	**-11.4**
Total, zinc die-castings & heavy-metal castings	10 135	11 367	-10.8			
Light-alloy castings	111 302	133 406	-16.6			
whereof: Aluminium die-castings	90 305	106 138	-14.9			
Permanent mould aluminium castings	15 689	22 235	-29.4			
Aluminium sand-castings	804	1 042	-22.8			
Magnesium castings	4 504	3 991	12.9			
Metal castings	**121 437**	**144 773**	**-16.1**	**811 730**	**973 652**	**-16.6**
TOTAL	**256 165**	**303 287**	**-15.5**	**1 194 175**	**1 405 477**	**-15.0**

Source: Association of the Austrian Foundry Industry

Employment

In 2020 the branch provided employment to a total of 6 538 persons (employees and workers), i.e. -5.7% compared to 2019. The number of industrial apprentices trained in professions related to our branch (foundry technology and metal foundry persons) fell with regard to 2019.

Incoming orders

All in all, companies are very much affected by the current economic situation.

Investment plans

The branch is divided in two where business and investments are concerned. Sectors closely related to the automotive industry and mechanical engineering mostly had to face sharp declines and therefore reduced their investment plans. Other sectors, however, enjoyed a high utilization of capacities and were able to implement their investment programs as planned.

Personnel cost

Minimum wage rises according to the collective wage agreement amounted to 1.45%.

Supply of commodities and energy

In 2020 commodity prices fluctuated and declined significantly towards the end of the year. However, at the beginning of 2021 prices rallied sharply. Electricity prices increased marginally compared to the previous year, whereas energy and gas prices fell slightly.

Outlook 2021

At the beginning of 2021 we registered a slight recovery compared to the crisis-year of 2020. A certain normality in the second half of the year is expected. National short-time working arrangements were extremely useful to help companies to get through the crisis. Still there is a long way to go before the pre-corona level will be reached again and this is not likely to happen in 2021.

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Macroeconomic developments

2020 General Economic Situation

As a consequence of the Covid-19 crisis, Belgian GDP dropped by 6.3% in 2020. The second quarter has been particularly negative (-14% compared with q2 2019), with a large range of activities strongly reduced if not brought to a halt. During the 3rd and 4th quarter however, the rebound of economic activity has been stronger than expected, in spite of new sanitary measures at the end of the year.

Household consumption dropped by 8.7% compared to 2019, mainly as a consequence of sanitary measures and low consumers' confidence. Government support schemes have protected households from the worst of the financial hit, while job and business support measures have allowed employment to remain broadly steady. Saving rate reached a record of 21.7%, from 13% in 2019.

Enterprises investment were also severely hit by the COVID-19 crisis. With the possibility of a long period of low activity and a fast deterioration of profitability, decisions were made to postpone or cancel existing schemes. However, the strong rebound in the second half of the year limited the drop of investment to 6.9% in total.

Belgium's exports suffered from the deterioration of world trade and disruptions in the flow of goods and services. They fell by about 4.5% on the whole year.

2021 General Economic Situation

Social-distancing measures will continue to curtail economic activity in the first half of 2021. However, as vaccination campaign progresses and Covid cases decrease, restrictions are gradually lifted. Economic growth is forecast to rebound by 4.5%.

Private consumption is forecast to rebound by 4.5%, not fully recovering from the crisis. Confidence only partially recovered and the gradual expiry of support measures is expected to contribute to a rise in unemployment (from 5.6% in 2020 to 6.7% in 2021). Therefrom, saving rate should remain high (16%). Increase in public consumption is also forecast to contribute to GDP growth in 2021. Investment are expected to accelerate to +6.0%. Business confidence is back to a high level and RRP will be progressively implemented. One major risk here is how the financial situation of enterprises will turn out after crisis measures are lifted.

Thanks to the strength of the external environment, exports are set to recover in 2021 (+5.9%). Following the recovery in domestic demand and exports, imports are also forecast to rebound strongly (+6.1%). The contribution of net exports to GDP growth is therefore expected to remain negative. Inflation is forecast to accelerate from a low 0.7% in 2020 to a still modest 1.7% in 2021, mainly driven by higher energy prices.

Thanks to widespread recourse to the "force majeure" temporary unemployment, job losses have been limited to 39 000 in 2020 and unemployment rate barely raised (from 5.4% in 2019 to 5.6%). However, the number of workers in temporary unemployment remains high at the moment and unemployment is set to increase in 2021, to reach 6.7%.

The situation in the major foundry customer industries

The activity of foundry customer industries has been severely affected by the Covid-crisis.
As soon as February lock-downs decided in China and Italy disturbed production in the sectors most involved in international added value chains: automobile, aerospace and mechanical engineering. With lock-down in Belgium from mid-March to end of April, other sectors followed soon. In the second quarter, activity fell by 20% to 25% in metal product and mechanical engineering, while collapsing by 45% in automobile & aerospace.
However, as soon as most severe sanitary measures were lifted, activity resumed fast. In the 3rd and 4th quarter, the gap with the corresponding period of 2019 narrowed significantly.
All in all, yearly fall of activity reached 7.5% and 8% in metal products and mechanical engineering and 13% in automobile & aerospace.

At the beginning of 2021, the situation is still contrasted from sub-sector to sub-sector. Aerospace has the biggest deficit of production compared to pre-crisis level, at about -30%. For subcontracting and metal work, but also machine-tool or gears & transmissions (mechatronics), the gap with 2019 is still close to 10%. Automobile suppliers on the international market and producers of commercial vehicles have fared better, but are still lagging few percentage points below pre-crisis level.
Best positioned sub-sectors are boiler makers, agricultural equipment and the Belgian cars assemblies (where e-vehicles are now produced). There the activity is currently higher than the 2019 average.

Table 1: Turnover evolution in major casting customer industries (in %)

	2016/2015	2017/2016	2018/2017	2019/2018	2020/2019
Mechanical engineering	-0.2	3.0	2.5	1.2	-8.0
Metal products	-1.9	2.3	4.0	2.3	-7.5
Automobile & aerospace	-10.0	-0.5	-0.5	-6.0	-13.0

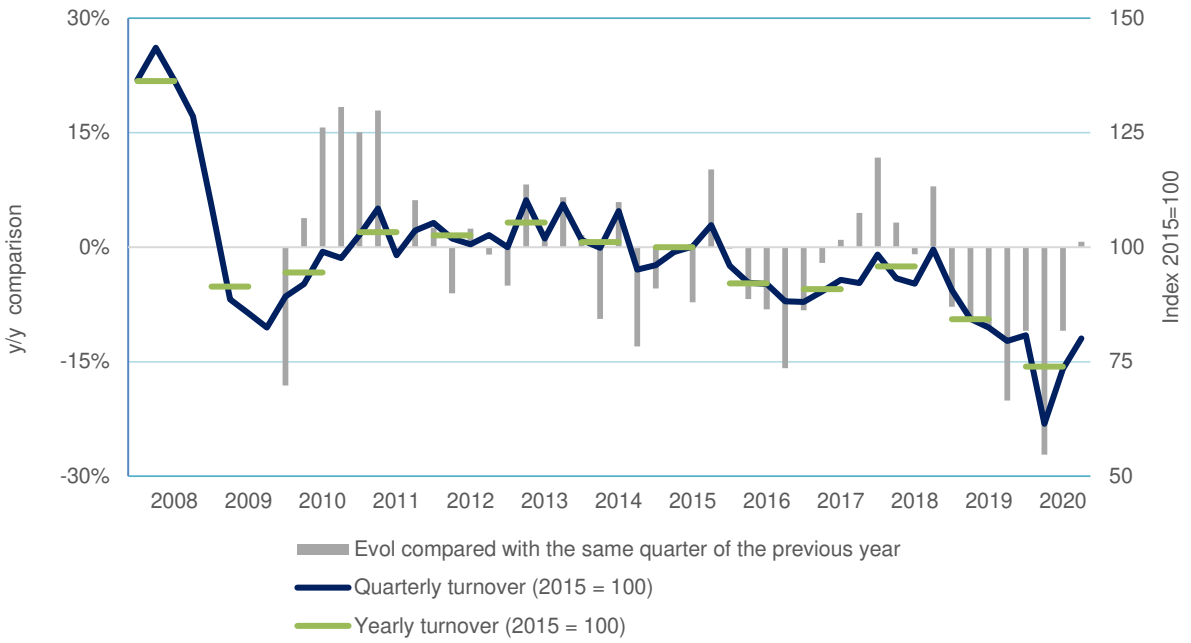
Source: Agoria estimates based on Prodcom statistics

The foundry industry in 2020

Industrial turnover

For 2020 as a whole, foundries' industrial turnover fell by 12%, a drop comparable to that of 2019.
The sector was already in an unfavorable situation at the start of 2020. Before that the Covid crisis affect the sector in March, a drop in turnover occurred in January and February compared to January and February 2019.
In the second quarter sales plunged by 28%. As elsewhere, this decline was concentrated in April and May (the lock-down period). Over the next few months activity began to pick up fast.
During the 3rd and 4th quarter, foundry industrial turnover confirmed its rebound and returned to its level at the start of the year. However, the sector's activity remains weak since it was already in a deteriorated situation before the Covid crisis. Outside 2020, we remain close to the lows of 2009.

Figure 1: Industrial turnover of foundry industry



Production

The production of the Belgian foundry industry dropped sharply in 2020. With about 54 422 tons, the level was 13% below the production of 2019. It is a fifth year of negative evolution and for a third year, this decline is present in all types of casting productions. The year on year evolution was negative during all four quarters of the year. It has been particularly strong during the 1st and 2nd quarter and less negative during the 3rd and 4th period of the year.

In iron casting, the biggest sub-sector of the Belgian foundry industry, the production decreased by 12% to 47 249 tons. At 5 515 tons, steel casting production declined by 16.5% compared with 2019.
The production in the non-ferrous casting was 24% below its level of 2019, at 1 658 tons

Cost development

According to Eurostat statistics, Belgian electricity market prices have evolved differently according to consumer type. For consumers between 2 000 and 20 000 Mwh, prices (before VAT) were mostly stable during the whole year. Their level in the second half of 2020 was 0,6% higher than in the second semester of 2019. For consumers between 20 000 and 70 000 Mwh, (before VAT) prices decreased by about 7% in the first half of 2020, before regaining ground later on. In the second semester, they were still 3.3% lower than in the second semester 2019. For both type of consumers, electricity prices in Belgium remain lower than in the EU 27 or the euro area. The gap even widened in 2020 as EU and EA prices increased by about 3%.

Belgian market price for industrial consumer of natural gas decreased by about 9% between the 2nd semester 2019 and the 2nd semester 2020. The advantage in prices compared with EU27 and the euro area staid close to -25%.

Average wage cost in 2020 was 2.1% higher than in 2019. This growth is due to the automatic indexation in July 2019, +1.95%, and in July 2020, +1.01%. There was also an increase outside indexation of 1.10% in July 2019.
For 2021, automatic indexation is expected to be limited to 0.8% in July. Since there is no other increase scheduled this year, the average increase of labour cost in 2021 is expected at 0.95% compared with 2020.

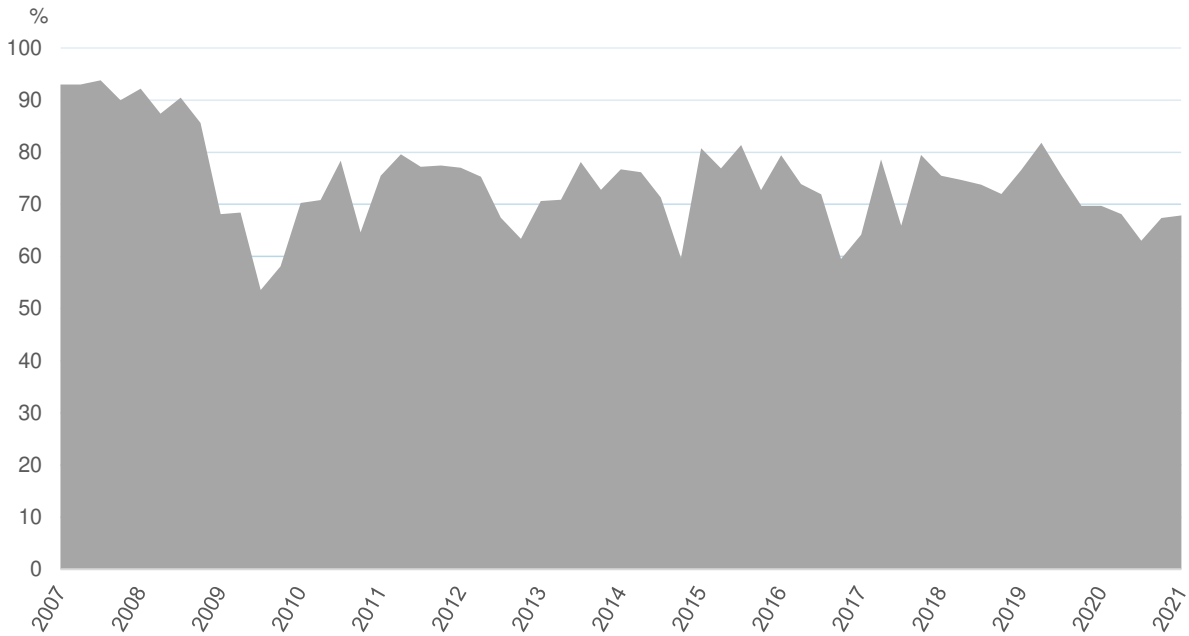
Outlook

Latest business surveys in the foundry industry produced positive signals. The improvement that began at the end of last year continued into the first months of 2021. A growing number of foundries regard their economic situation as neutral or even favorable.

In particular, the demand for the products of the sector has improved as illustrated by the assessment of the order book level: in April 2021 most foundries regarded their orders as being at a “normal level for the period of the year”. The improvement here is recent since in January, they were 75% to consider their orders as too low. Expectations for the next three months have also evolved favorably. In April, a stabilization is expected by the majority and about 1/3 of foundries even expect a growth.

The assessment of capacity utilization improved during the last quarters. However, at 67.9%, it is still below its average since 2010 (72.5%). These factors have affected employment prospects. In April, the indicator shows almost unanimous anticipation of stabilization for the next three months. Few expect to raise their work force, none anticipate a decrease.

Figure 2: Capacity utilization in the foundry industry



Source: National Bank of Belgium, quarterly business surveys

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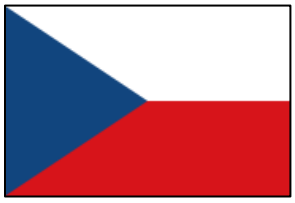

Foundry production

Foundry production in 2020 suffered a severe stroke to the COVID-19 pandemic with the decline in production at the end of 2019 halting in January 2020. In February, production started to rise again and everything looked optimistic. Since March 2020, the COVID-19 pandemic has arrived, which was fully reflected in May 2020, when production fell sharply at some foundries up to 50% of production capacity. After a slight breath in the summer months a second wave came, which paralyzed the foundry industry again. This continued in early 2021.

Table 1: Casting Production

Fe metals castings	2020	2020/2019	Non-ferrous metals castings	2020	2020/2019
GJL	117 000 t	- 29%	**AL+Mg**	78 500 t	- 18%
GJS	34 500 t	- 31%	**Cu**	16 000 t	- 20%
Steel	41 000 t	- 21%			
Totally	192 500 t	- 28%	**Totally**	94 500 t	
TOTAL		**287 000 t**			**- 25%**

The COVID-19 pandemic has not only halted the influx of new orders, but has also suspended existing ones. Despite the low percentage of infected foundries workers (about 1%) the casting production was indirectly halted due to strong drop-offs in orders from ordinary customers. Fortunately, there was no "lockdown" of the industry as in the consumer sector, and foundries thus retained their customers. The casting business has almost come to a halt. Communication and contacts were maintained electronically, the development of new projects was very difficult. It cannot be a surprise that total production fell by 25% to 287 thousand tons in 2020. Further decline in the already under-staffing of the foundry industry has also been affected by the pandemic. This decrease is estimated by 8% to about 15 000 employees in foundries. This deficiency manifested itself in early 2021, when orders were growing, but it was not possible to fill shifts. The production volume is the lowest in the history of the Czech foundry industry. It was lower in all produced materials than in the crisis year 2010.

The total production of Fe castings in 2020 was about 192 500 tons. The year-on-year decrease was 25%. Two large and two medium foundries stopped production altogether, many others had economic problems. Fe foundries' turnover fell by 16%, so it did not copy the drop in production. The increase in turnover was affected by the increase in the prices of foundries' inputs, in particular the prices of scrap metal and pig irons. For steel foundries, there was a high increase in the prices of alloying additives, and in general a continuing increase in energy prices. At the same time, labour costs per employees increased. The low productivity of foundries' work is due not only to equipment and technology, but mainly to the character of orders. In serial production, there is a high pressure on the price. Long-term orders do not reflect the continuous increase in input prices. Material surcharges will have to be implemented again.

In 2020, steel casting production volumes fell to 41 000 tons, an all-time minimum. Due to the number and production assortment of Czech steel foundries, this value is temporary due to the COVID-19 pandemic. The economically sustainable number of steel foundries in the Czech Republic means the annual production of at least 50 000 tons of alloy-steels. Carbon ones are no longer economically

sustainable. Production demands, high production costs and low labour productivity are the specifics of steel castings. Companies are looking for a way out in modern technologies such as 3D printing of metals. In this area, Czech companies try to keep up with the competition.

The lock-down of the automotive industry in 2020 negatively affected the production volumes of pressure-cast parts from Al alloys and at the same time the castings made of Zn alloys. Fortunately, despite a significant decrease in casting production volume to a total of about 78 thousand tons, it did not achieve the "collapse" of 2009. However, in the year-on-year comparison, this decline was higher by about 2%. On the other hand, compared to the crisis in 2009, there were much higher investments in 2018-2019, which companies now have to pay back hard. High productivity is based on modern technologies with mass use of robots. Despite the use of modern technologies, foundries here face a shortage of workers similarly to Fe foundries.

After a period of "rest stagnation", the production of castings from copper alloys recorded a 20 percent decrease in production volumes. Labour productivity is low and it is based on the skill of qualified personnel. Production volumes are expected to grow gradually in the near term.

The COVID-19 crisis, as everywhere around the world, has had a very strong impact on 2020 in all sectors. This new disease has crippled the overall economy of the Czech Republic. Compared to 2019, gross domestic product decreased by 5.6% and industrial production decreased by 8%. The national debt increased by about CZK 400 billion. Fortunately, during the pandemic, production companies were not closed, which kept companies in contact with customers and, as a result, alive. Companies received state support for Antivirus A, B, C to reduce the economic impact of the pandemic. The first half of 2021 again experienced a very strong impact of the COVID-19 pandemic and its mutations. However, the situation is different from last year. Foundries have orders. Delivery dates are complicated by a shortage of workers. The Czech Republic continues to maintain its unemployment rate at around 4%. Covid's "Attack" has a strong impact on the Czech economy. It's going to take a lot of effort and energy to get to normal. New grant titles are being prepared, including a modernisation fund for renewal from EU funds and state support. It is likely that this support will reach the foundries as well. The Association of Czech Foundries cooperates intensively with the authorities concerned for the benefit and sustainability of the foundries in the Czech Republic.

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Economic Background

The Finnish Technology Industry as a whole

According to preliminary data, the turnover of technology industry companies in Finland grew by approximately 1% in 2020 from 2019. Turnover grew in electronics and electrotechnical industry as well as in information technology and fell in mechanical engineering, metals industry and consulting engineering. Overall, the technology industry sectors fared much better than expected during the first year of the pandemic. In 2020, their turnover in Finland amounted to approximately EUR 83 billion. Order intake for the fourth quarter exceeded expectations and came as a very positive surprise. The information technology companies that took part in the Federation of Finnish Technology Industries' survey of order books reported that the monetary value of new orders between October and December was as much as 60% higher than in the preceding quarter and 21% higher than in the corresponding period in 2019. While this significant improvement is partly due to some very large orders received during the last quarter, the volume of new orders was nevertheless much higher. Order intake improved for companies of all sizes in all technology industry sectors. The number of requests for tender also picked up at the turn of the year. The balance figure for January was positive (+8), indicating a pick up in demand since October. At the end of December, the value of order books was 10% higher than at the end of September and 4% higher than in December 2019. It is important to note that shipyards' share of the total value of books remains exceptionally large. Judging from order trends at the end of 2020, the turnover of technology industry companies in early 2021 is expected to be at a similar level as in the corresponding period in 2020. The number of personnel employed by technology industry companies in Finland was down approximately 1% from the 2019 average. On average, the industry employed 310 000 people in 2020. At the end of December, the industry had 308 000 employees, which is some 7 000 less than during the third quarter of 2019, which saw the highest number of employees since the financial crisis. According to the personnel survey by the Federation of Finnish Technology Industries, the number of employees affected by lay-off procedures at the end of December was close to 28 000. Recruitment of new employees remained at a low level in the October-December period. In total, recruitments came to 6 500. Some companies were increasing their personnel, others were hiring new employees due to retirements and employee turnover.

Mechanical Engineering in Finland

According to preliminary data, the turnover of mechanical engineering companies (machinery, metal products and vehicles) in Finland decreased by slightly more than 1% in 2020 from 2019. In 2020, their turnover in Finland amounted to slightly less than EUR 33 billion. The value of new orders in mechanical engineering increased as much as 71% from the previous quarter in the October/December period. Year-on-year, the value of new orders increased by 1% . This improvement is partly due to some very large orders received during the last quarter that extend long into the future. However, even without these orders, order intake developed very well. At the end of December, the value of order books was 3% higher than at the end of September, but 3% lower than in December 2019. Shipyards' share of the total value of order books is exceptionally large. As much as 71% of the strengthening of the order books since early 2014 is attributable to ship orders. Judging from order trends at the end of 2020, the turnover of mechanical engineering companies in early 2021 is expected to be at a similar level as in the corresponding period in 2020. The number of personnel in mechanical engineering companies in

Finland decreased by 2% in 2020 from the 2019 average. The industry employed some 131 000 people, down 2 600 from 2019.

Metals Industry in Finland

According to preliminary data, the turnover of metals industry companies (steel products, non-ferrous metals, castings and metallic minerals) in Finland decreased by approximately 2% in 2020 from 2019. In 2020, their turnover in Finland amounted to approximately EUR 10 billion. The total production of steel products, non-ferrous metals, castings and metallic minerals in Finland in the January-November period decreased 2% year-on-year. The number of personnel in metals industry companies in Finland fell by 3.5% in 2020 from the 2019 average. The industry employed some 16 100 people, down 600 from 2019. Global steel production fell by approximately 1% from 2019. Production increased by 1.6% in Asia, but fell by as much as 12% in the EU. Production in the United States decreased by 17%. The growth of Asian and global steel production in 2020 is due to the increase of production by more than 5% in China, which is the largest producer. Production fell by approximately 11% in India, approximately 16% in Japan and approximately 6% in South Korea. China, India, Japan, the United States and South Korea were the largest producers in 2020. China accounted for approximately 58% of global steel production.

Foundry Industry in Finland

In the year 2020 the total production of castings in Finland decreased about 19% in 2020 from 2019. The production of iron and steel castings was 47 052 tons which is 19% less compared to year 2019. Iron and nodular iron casting production decreased about 15% and steel casting about 36%. Metal castings production was 4 145 tons, which is about 22% less than the previous year. The value of the casting production of Finnish foundries was 188 m€, which is 18% less compared to year 2019. The foundry industry employed 1 514 people, 131 less than in 2019.

Table 1: Finnish grey cast iron production

GJL	2020	2019	Change in %
Production	17 270 t	18 161 t	- 5
Export	3 899 t	3 905 t	0
Value of production	31,92 m€	34,35 m€	- 7
Employees	645	724	- 11

Table 2: Finnish ductile cast iron production

GJS	2020	2019	Change in %
Production	23 118 t	29 285 t	- 21
Export	8 002 t	8 957 t	- 10
Value of production	51,95 m€	71,54 m€	- 27
Employees	645	724	- 11

Table 3: Finnish steel casting production

Steel Castings	2020	2019	Change in %
Production	6 664 t	10 397 t	- 36
Export	1 997 t	1 597 t	25
Value of production	58,95 m€	71,85 m€	- 18
Employees	525	540	- 3

Table 4: the Finnish non-ferrous casting production

Non-Ferrous Castings	2020	2019	Change in %
Production	4 145 t	5 308 t	- 22
Export	886 t	1 657 t	- 47
Value of production	45,23 m€	51,00 m€	- 11
Employees	344	381	- 10

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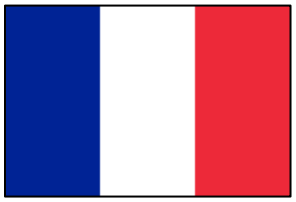
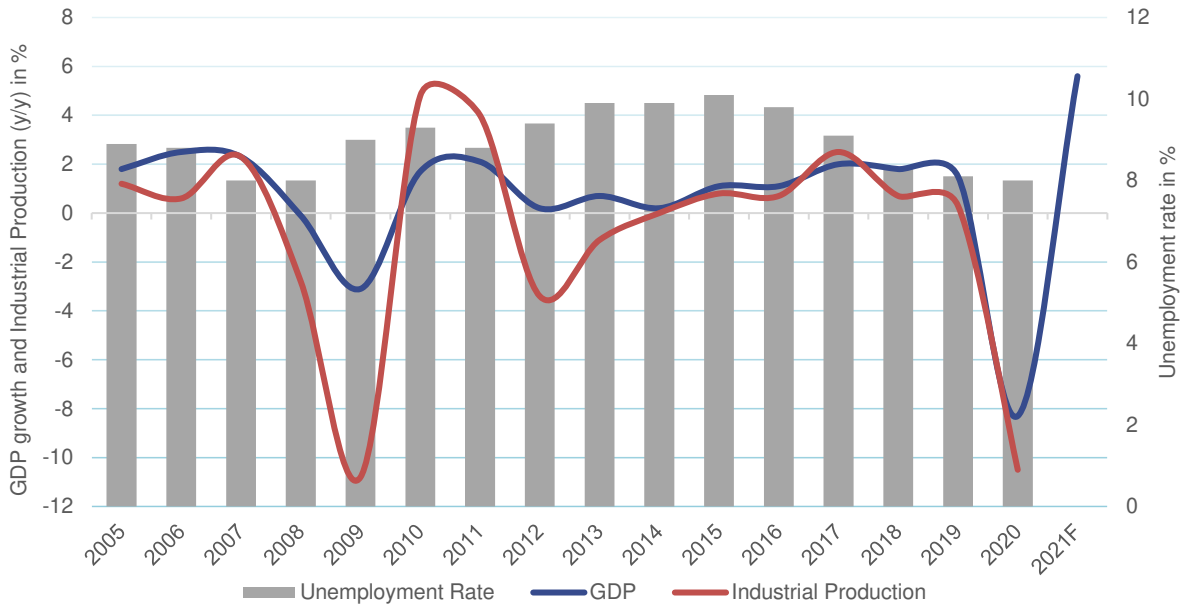


Macroeconomic developments

The Coronavirus health crisis hit the French economy hard in 2020. The French economy's decline is -8.3% in 2020 after growth of +1.5% in 2019. In 2021 the French GDP is estimated to growth by 5.6%. Industrial production fell by -10.5% in 2020, which is a consequence of the 2 lockdowns at the beginning and at the end of the year. The unemployment rate is limited to 8% at the end of 2020.

Figure 1: GDP growth, Industrial Production and Unemployment Rate

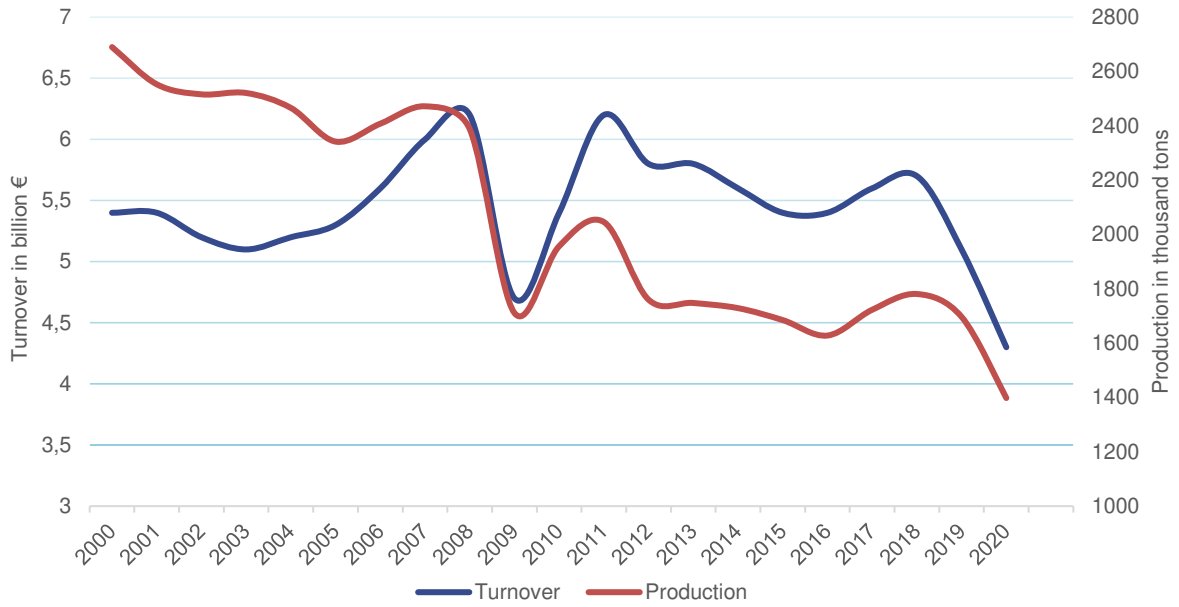


Situation of the foundry industry

After the decline recorded in 2019, production and billings fell sharply in 2020. This decrease affects both the ferrous metal foundry and the non-ferrous metal foundry. The activity of the foundry industries, all sectors combined, decreased:

- Total production fell by 17.6% (in tons).
- Total billings also fell by 17.0%.

Figure 2: Evolution in volume and in value



The health crisis weakened demand from the main customer markets in France and weighed on the development of the activity of the foundry industries. Automobile production fell sharply in 2020, with this sector being the main outlet for the French foundry (more than 40% of the total outlet). The building and roads constitute the second customer sector of the foundry. Construction recorded a drop in activity in 2020 according to the FFB. As for French mechanics, the third largest customer market for foundry companies, this sector recorded an 11% drop in production in 2020. The weakness of the German market severely limited the increase in total exports. This sharp slowdown, recorded both in France and internationally, resulted in a drop in the activity of the foundry industries. The monthly survey carried out among a representative panel of foundry industries showed that this drop in production and turnover is very significant during the first half of 2020. This period was marked by a strict lockdown of two months. Some companies have recorded a drop in activity of up to -60%.

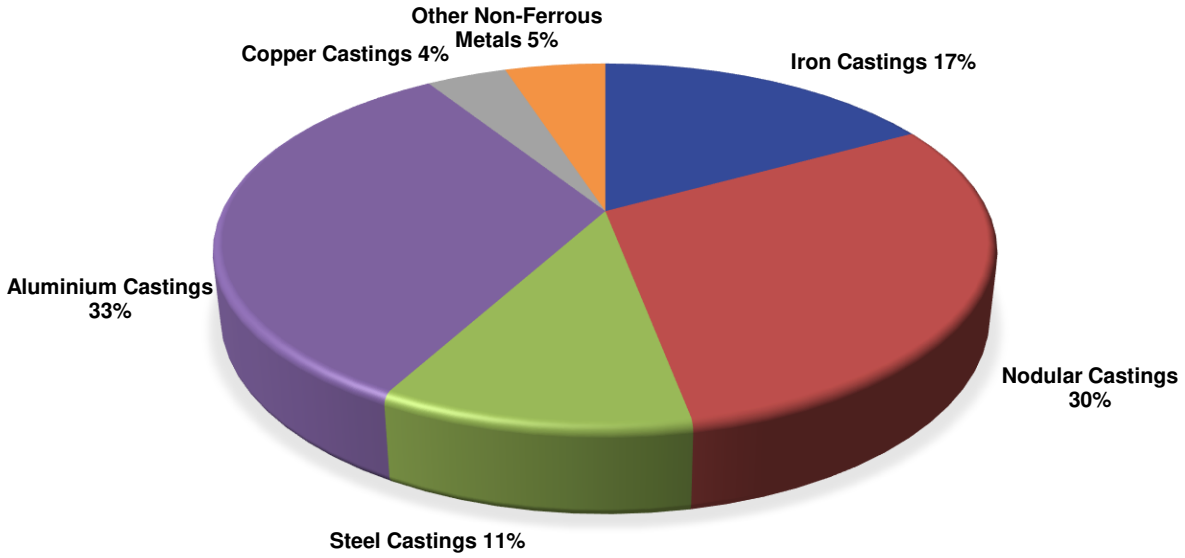
In total, ferrous and non-ferrous metal foundries produced 1 398 million tonnes in 2020 compared to 1 696 million tonnes in 2019.

Table 1: Production by alloys

	2020 production in t	Change 2020/0219 in %
Iron Castings	431 916	-19.6
Nodular Castings	593 564	-16.6
Steel Castings	41 889	-24.8
Total Ferrous Castings	**1 067 369**	**-18.2**
Aluminium Castings	293 529	-15.7
Copper Castings	16 118	-7.4
Other Non-Ferrous Castings	21 060	-21.9
Total Non-Ferrous Castings	**330 707**	**-15.7**
TOTAL	**1 398 076**	**-17.6**

The total production value of the foundry industries is estimated at 4.3 billion euros in 2020.

Figure 3: Segmentation by main alloys



The workforce of the French foundry fell in 2020 driven by the decline in activity; the decrease is -2.3% compared to 2019. The number of employees is estimated at 28 852 people at the end of December 2020. The number of companies in the foundry sector is 380 (<10 people included).

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The German Economy and the Casting Customer Industries

Macroeconomic developments

According to first calculations of the Federal Statistical Office (Destatis), the price adjusted gross domestic product (GDP) was 5.0% lower in 2020 than in the previous year. After a ten-year growth period, the German economy suffered a deep recession in 2020, the year of the corona, a situation like that of the 2008-2009 financial and economic crisis. However, the economic downturn overall was less serious in 2020 than in 2009 (-5.7%), according to provisional calculations.

Almost all economic sectors were markedly affected by the corona pandemic in 2020. Production was in part severely scaled down both in the service sector and in industry.

In industry (excluding construction), which accounts for just over one quarter of the total economy, the price adjusted economic performance declined by 9.7% on 2019, in manufacturing even by 10.4%. Industry was affected by the consequences of the corona pandemic especially in the first half of 2020, for instance, due to temporary interruptions in the global supply chains.

The economic slump was particularly strong in the service sector where decreases were partly as severe as never before. Examples include trade, transport, accommodation, and food services where the price adjusted economic performance declined by 6.3% compared with 2019. However, opposite trends were also recorded: online trade increased markedly, while permanent retail trade in part declined substantially. The tight restrictions in accommodation, restaurant and similar services led to an outstanding decline in accommodation and food services.

A sector that could sustain its position in the crisis was construction: price adjusted gross value added even increased by 1.4% year on year.

The impact of the corona pandemic was marked also on the demand side. In contrast to the financial and economic crisis, when the economy was supported by all components of consumption expenditure, household final consumption expenditure in 2020 fell a price adjusted 6.0% year on year, which was an unprecedented decrease. Government final consumption expenditure saw a price adjusted 3.4% increase and had a stabilising effect even in the corona pandemic. This was, among other things, based on the acquisition of protective equipment and hospital services.

Gross fixed capital formation recorded a price adjusted decline of 3.5%, which was the largest decrease since the financial and economic crisis of 2008/2009. Contrary to this trend, gross fixed capital formation in construction was up 1.5%. Gross fixed capital formation in machinery and equipment decreased a price adjusted 12.5% on the previous year. Gross fixed capital formation in other fixed assets, which include in particular research and development, was down a price adjusted 1.1% according to first estimates.

The corona pandemic also had a massive impact on foreign trade. Exports and imports of goods and services in 2020 decreased for the first time since 2009, that is, exports by a price adjusted 9.9% and imports by 8.6%. The decline was particularly large for imports of services; this was mainly due to the high proportion of tourism, for which a sharp fall was recorded.

On an annual average in 2020, the economic performance was achieved by 44.8 million persons in employment whose place of employment was in Germany. That was a decrease of 477,000, or 1.1%, in 2019. Due to the corona pandemic, the upward trend in employment ended, which had lasted for over 14 years, even during the financial and economic crisis of 2008/2009. This affected especially marginally employed people and self-employed, whereas the number of employees subject to social insurance remained stable. Dismissals seem to have been avoided especially by the extended regulations regarding short-time work.

General government budgets recorded a financial deficit (net borrowing) of 158.2 billion euros at the end of 2020, according to provisional calculations. It was the first deficit since 2011 and the second highest deficit since German reunification and was exceeded only by the record deficit in 1995 when the debt of the Treuhand agency were integrated in the general government budget. Central government accounted for the largest share of the financial deficit (98.3 billion euros), followed by state government (26.1 billion euros), social security funds (31.8 billion euros) and local government (2.0 billion euros). Measured as a percentage of nominal GDP, this was a 4.8% deficit ratio of general government for 2020. The European 3% reference value of the Stability and Growth Pact and the target value of the national debt brake were clearly exceeded. However, applying the two targets has been suspended for 2020 and 2021 due to the corona pandemic.

The situation in the major casting customer industries

In 2020, the highest registration volume ever achieved in one December was recorded. The expiry of the VAT reduction introduced by the German government in the wake of the corona pandemic to stimulate demand had a significant influence on the market development at the end of the year. Nevertheless, the exceptionally good final month could not prevent the domestic market from reaching a level of only 2.9 million passenger cars (-19%) in 2020. In the period from January to December 2020, domestic incoming orders were down 17 per cent. Foreign business fared better: customers from abroad ordered roughly 11% fewer passenger cars from German OEMs in 2020. At 3.5 million units, domestic passenger car production in 2020 was also significantly below the previous year's figure (-25%) and reached the lowest volume in 45 years. For the year as a whole, German passenger car exports are also clearly in the red at 2.6 million vehicles (-24%). E-mobility became more popular than ever before in Germany in 2020, despite the approximately twenty percent drop in registration figures in the year of the COVID 19 pandemic. Alternative drives (battery-electric, hybrid, plug-in, fuel cell, gas, hydrogen) claimed around a quarter of all new registrations. The number of newly registered passenger cars with purely electric drive increased significantly by +206 percent compared to the previous year. A total of 394,940 new cars with electric drive were registered in 2020. In the case of battery-electric passenger cars, private new registrations already accounted for almost half of all new registrations.
In the commercial vehicle market, only buses (+0.4%) were above the previous year's level. Trucks (HGVs) (-14.1%) and tractors in total (-7.4%), including semi-trailer tractors (-32.8%) ended the year with a minus.
The increased demand for electronic products resulting from the corona pandemic has led to a bottleneck in the supply of semiconductors. The German automotive industry was not prepared for such a development, especially since the ramp-up of production was surprisingly fast after a temporary production standstill in the spring and thus did not include a long-term planning horizon. As natural disasters hit important semiconductor production sites, the semiconductor shortage has extended well into 2021. As a result, the forecast for the German passenger car market had to be adjusted from an initial 20% to 3%.

The global Corona crisis has also led to high export losses for machinery and equipment manufacturers. In 2020, machinery and equipment worth 160 billion euros were exported from Germany and imported for 67 billion euros. Exports were thus 12.0 per cent and imports 13.4 per cent lower than in 2019. Machinery exporters from Germany thus recorded the highest year-on-year declines since the financial and economic crisis in 2009. Not all sectors were equally affected by the double-digit decline in exports. Machine tool manufacturers recorded a sharp drop of 29.4 percent. In contrast, agricultural machinery was able to increase exports to the world by 1 per cent compared to 2019. While 13 per cent fewer orders came from abroad (euro countries -11% and non-euro countries -13%), domestic orders in 2020 remained 6 per cent below the previous year's level. Production in the machinery and engineering sector

in Germany fell by 12.1 per cent in real terms compared to the previous year. Due to a strong recovery the forecast for the German engineering sector for 2021 was adjusted by the VDMA from +4% to +10% within the first half of 2021. The tense situation on the commodity markets is however having a dampening effect.

In 2020 Germany produced 35.7 Mt of crude steel. This accounts for a decline by 10.0% compared to 2019.The recovery in 2021 and 2022 is expected to be healthy, driven by recovery in all steel-using sectors, especially the automotive sector, and public construction initiatives.
Companies in the main construction industry in 2020 generated construction-related turnover of 143 billion euros, which was 4.5% in real terms. In 2020, residential construction had performed with an increase in turnover of 10.5% in nominal terms. The Corona crisis had no significant negative impact on the still high demand for housing. Although most construction projects were allowed to continue during the pandemic lockdown, so that the construction industry came through the crisis unscathed, for 2021 the rising and sometimes limited supply of building materials will put pressure on the market.

Developments in the foundry industry

In 2020, Germany´s iron and steel foundries received orders for around 3.0 million tons of castings. Compared to 2019, this marks a decrease of 14.1%. Orders from the biggest customer industry, motor vehicle engineering, were 8.5% lower than the year before (1.8 million tons). At 638,300 tons, the volume of orders from the mechanical-engineering industry went down by 15.4% compared to the previous year. Circa 0.5 million tons of parts for miscellaneous applications were ordered, a level that is 28.7% lower than in the preceding year.

Germany´s foundries focused on non-ferrous components received an order volume of 769.900 tons. The demand went down by 24.7% compared to 2019. With approximately 76% of incoming orders the vehicle industry is dominating the non-ferrous sector. The nominal demand dropped by 25.1% (583.900 tons). The foundries related to mechanical engineering received orders with a volume of 7.100 tons (-13.6%). Nearly 179,000 tons of miscellaneous parts were ordered, which is a decrease of 23.9%.
We should bear in mind, that there is a lack of definition between engineering and miscellaneous applications, e.g. electrical engineering. This applies for all casted materials.

In 2020, the weight of castings produced by Germany´s iron and steel foundries amounted to 2.7 million tons. Compared to 2019 this corresponds to a 28.6% decrease. By looking at the two major customer industries, casting production for the motor vehicle industry declined by 27.4% to 1.5 million tons, while production for the mechanical engineering sector fell by 31.1% to 643 500 tons. The output of castings for miscellaneous functions (including rolls, moulds and castings for buildings as well as pipes and fittings) reached a volume of 557 700 tons, 28.9% less than the previous year.

Non-ferrous foundries registered a production decrease of 24.5%, correlating with a volume of 769 100 tons of castings. While more than 76% were produced for the vehicle industry (587.600 tons), this output dropped by 25.2%. The casting of non-ferrous components for all other customer industries fell by 22.4% and therefore had a volume of almost 181 500 tons.

In 2020, 33.3% of the total production volume was exported directly. All in all, 1.16 million tons were sold to customers abroad, representing a 30.7% decrease.

By the end of 2020, orders in stock equaled a weight of more than 1.29 million tons of ferrous castings, 9.1% lower than at the end of 2019. The non-ferrous back orders had a volume of approximately 193 000 tons (-21.3%).

Capacity utilisation in the iron (grey and nodular) foundry industry amounted to 67.1% in 2020. In comparison to 2019, this means a decrease of 17.5 percentages. Steel foundries have reported a capacity utilisation of 71.7%, 9.3 percentages less than in 2019. Capacity utilisation in the non-ferrous

foundry industry is calculated as 65.1% in 2020 (minus 14.8 percentages). Capacity utilisation in ferrous, steel and non-ferrous foundries cannot be compared.

The employment situation

As of December 2020, Germany´s foundries (ferrous and non-ferrous) employed circa 67 900 persons, 9.8% less than at the end of 2019. This figure corresponds with 371 foundries (survey cut-off at <50 employees per company).

At the end of 2020, 552 foundries (ferrous and non-ferrous, no cut-off) were operating in Germany.

Raw materials and energy

Main characteristic of several raw materials and energy sources is that both, supply and demand, are highly price inelastic. In other words, neither available supply nor demand depends on the given price, since production is based only on merits of what is needed. This becomes particularly pronounced in the case of scrap, one of our industry's most crucial resources.

No one "produces" scrap. Scrap incurs rather as "unavoidable" remnant of other industrial activities. The metalworking businesses even strive, independent of the price, to minimize scrap accrual.

On the other side stands the demand, having virtually no substitution opportunities. If 25 tons are needed to fulfill an order in time, they will be purchased "no matter the costs".

To balance out supply and demand under the aforementioned circumstances, high price fluctuations are the consequence. Already smallest diversions in offered supply or demanded quantity result in rising or falling prices, due to a shortage on one of the two sides. Additionally, speculations at the metals exchanges have a co-amplifying effect.

In 2020, energy costs and input materials (oil, gas, electricity and coke) experienced a decline due to the sharp drop in demand until Q3. The price of coke fell by around 15%. However, a significant cost increase can be expected for coke from 2023 on-wards due to the introduction of a "CO2 tax" through the Fuel Emissions Trading Act (BEHG). After a veritable price explosion at the beginning of the Corona pandemic, the price of furfuryl alcohol is back at about the same level as in 2015. Developments for heating oil were more relaxed last year. Here, the decline averaged about 30% for the year - and according to the Federal Statistical Office, natural gas became around 19% cheaper.

Metallic input materials

Generally, raw materials account for about 25% of prime costs. Hence, they have the second largest importance after personnel costs. In this respect, reliable documentation and observation of developments and forecasting with regard to planning, control and quotation calculation are very helpful.

The costs of raw materials can only be calculated separately and daily. Finally, a price increase in raw materials of only 10% causes an increase in the cost price of about 2.5%. Pig iron fell by 9 % on average in 2020, scrap by 6%. But while many commodities experienced a correction at the beginning of the pandemic since November 2020 quotations know only one direction: upwards!

Before Corona, prices had reached their lowest point at the turn of 2015/2016. For 2020, looking at average values is irrelevant - the price dynamics since the end of the year are too great. The rapid strengthening of the Chinese economy has caused a shortage of scrap and primary metals on the world market. The "recovery" had already begun in May and June of last year. Initially, non-ferrous metals in particular rose continuously; later, the same dynamics set in for scrap and pig iron. There is no end in sight in mid-2021. Consequently, the outlook is also uncertain. Speculations on the metal exchanges are also fueling the fluctuations.

Payroll costs

The share of personnel costs in the cost of goods sold has risen to just over 30% on average.

Various factors have an influence on the level of personnel costs: in particular, the agreements of the collective bargaining partners should be mentioned. These agreements were particularly high for the years 2018 and 2019, especially as the past year was not particularly successful for many foundries. Although only about half of the companies are still bound by collective agreements, the shortage of skilled workers is leading to a shortage of qualified personnel with a corresponding increase in wage expectations. Furthermore, the additional costs (from social security) imposed by law must be mentioned above all. Finally, sickness-related absences, the number of public holidays, overtime, and shift bonuses as well as voluntary employer benefits have an impact on the annual development of personnel costs. Of all these factors, only some are known and published. For others, assumptions must be made. They are disclosed in the brochure "Key business figures for the foundry industry". Where there are different regulations in individual federal states, the conditions in North Rhine-Westphalia are the basis.

As already mentioned, the parties to the collective agreement waived a pay increase or special payment in 2020. At the same time, in 2020 the contribution to unemployment insurance was reduced from 2.50% to 2.00%. The additional contribution to health insurance was increased from 0.90% to 1.10%. For all the effects mentioned, the employer pays a parity (half) contribution. This results in an increase in personnel costs of 0.05% for the year 2020 - considering the key points and excluding wage increases as well as the reductions or increases in the contribution rates of the social insurance funds.

In other words: with personnel costs accounting for 30% of the cost price, an increase of 0.05% results in an increase of 0.15% in the cost price. If the change in personnel costs with a share of around 41% is applied to manufacturing costs (i.e. the cost of goods sold excluding raw material costs, as shown in the table), these will have increased by 0.20% in 2020.

Due to the reinstatement of the ERA pay agreement of 14 February 2018 in the new collective agreement, the pay table of 1 April 2018 continues to apply unchanged. In addition, a Corona allowance of 500 euros for full-time employees and 300 euros for apprentices was agreed for 2021. There are special regulations for part-time employees and employees with interruption periods.

Energy

Measured against the peak prices for (crude) oil in the summer of 2014, prices were lower until October of 2020. The price for 100 litres of heating oil here was just under 40 euros. Since then, it has risen to around 65 euros by May 2021. Commodities and energy prices go hand in hand!

The prices for electricity are primarily subject to individual company circumstances. The time and duration of the conclusion of the contract have a considerable influence not only on the level, but also on the development of electricity costs, in addition to the purchase quantity, grid fees and agreed peak loads. In 2020, the EEG levy returned to the record level of 2018. In addition, many limited foundries faced the risk of falling outside the cap due to lower gross value added. This circumstance was avoided in time by a decision of the Federal Government. The grid fees in particular rose slightly again in many places in 2020, although the actual price of electricity generation was below the level of 2019 due to the drop in cost prices in the meantime. In the case of grid fees, it should be noted that the fluctuations varied greatly between the large grid operators and the respective regions. Overall, the electricity price reported by the Federal Statistical Office fell by 2%. This is an indication of the overcompensation of EEG and grid fees despite lower electricity production costs.
After there was a significant increase in the price of coke in December 2018, the year 2020 was relaxed for the cupola foundries, at least in terms of material costs. The coke price decreased significantly last year and was almost at the level of 2014/2015 on an annual average. At the same time, the coke aggregate is under strong political and social pressure, even though it remains the cheapest smelting

process at high utilisation rates and represents the best recyclability of scrap. Unfortunately, this "circular idea" and the recyclability are little perceived by the public.
According to the figures of the Federal Statistical Office, gas has even become 30% cheaper in 2020. However, there has been a considerable dynamic since November 2020.

Miscellaneous

In the wake of the economic crisis caused by the Corona pandemic, with sales slumping by 25% or more, the price of crude oil suffered an unprecedented slide in March due to the global lockdown and tensions between oil-producing countries. Since the end of 2020, commodity prices have risen massively. In addition, the semiconductor shortage and the recent accident in the Suez Canal in April 2021 demonstrate the fragility of global supply chains.

Summary

Based on our model calculations, it was shown that the developments shown had an almost unchanged effect on the prime costs in 2020. As in many years, foundries with labour-intensive processes that produce hand-moulded castings with electric melting energy had to cope with the greatest cost increases. However, in view of the continuing price dynamics of many raw materials and supplies, it can be assumed that 2021 will be characterised by considerable fluctuations - in both directions.

The Situation in the Material Sectors

Grey cast iron

Throughout 2020, production decreased by 26.1% to 1.619 million tons. The output of motor vehicle components fell by 29.2% to 1.076 million tons. The volume of casted parts for mechanical engineering decreased by 27.6% to 302 400 tons. Other grey iron components (including moulds and railway parts, fittings, and components for the steel industry) reached an output volume of 240 600 tons (-6.3%).

Iron foundries received orders for approximately 1.021 million tons of castings from the motor vehicle industry, which is a 17.9% decrease. The demand of the mechanical engineering industry reached a volume of 299 300 tons. Thereby, the orders fell by 12.1%. Orders for parts for miscellaneous applications made of cast iron reached a volume of 185 600 tons, 1.9% less than in the preceding year.

At the end of December 2020, the order backlog amounted to more than 759 200 tons, 0.2% lower compared to the end of December 2019.

Ductile cast iron (nodular and malleable)

At 957 100 tons, the production of ductile iron castings was decreased by 33.2% 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 fell by 23,0% to 427 000 tons. The volume of casted parts for mechanical engineering fell by 32.4% to 317 500 tons. Other components reached an output volume of 212 600 tons (-48.1%).

At the ductile iron sector, the volume of incoming orders reached 1.329 million tons (-11.6%). Ductile iron foundries received orders for more than 798 300 tons of castings from the motor vehicle industry, which is an increase of 7.8%. With minus 15.2% compared to the order volume received the year before, the demand of the mechanical engineering industry reached a volume of 317 800 tons. Orders for parts for miscellaneous applications made of ductile cast iron reached almost a volume of 213 200 tons, 45.1% less than in the preceding year.

At the end of December 2020, the order backlog amounted to 489 500 tons, 19.0% less compared to the end of December 2019.

Steel

Throughout 2020, production of steel castings fell by 22.6% (138 000 tons). The output of motor vehicle components decreased by 27.2% to 9 900 tons. The volume of casted parts for mechanical engineering fell by 49.6% to 23 600 tons. Other components reached an output volume of 104 500 tons (-11.3%).

At 123 800 tons, the volume of orders received by the producers of steel castings in 2020 was decreased by 24.6% compared to the year before. Steel foundries received orders for 11 200 tons of castings from the motor vehicle industry, a downturn of 25.8%. The demand of the mechanical engineering industry reached a volume of 21 100 tons (-46.2%). Orders for parts for miscellaneous applications made of steel castings reached nearly a volume of 91 400 tons, 16.8% less than in the preceding year.

At the end of December 2020, the order backlog amounted to 45 200 tons. The order cushion was 23.4% lower compared to the end of December 2020.

Non-ferrous Metal Castings

In 2020 the production of aluminium castings decreased by 24.3% (652 700 tons). For the magnesium sector the production reached a level of 20 500 tons (-9.6%). The output of copper castings fell by 40.3%. The level was more than 46 100 tons. Nearly 49 800 tons of zinc castings were produced, marking a decrease of 13.0%.

Aluminium foundries received orders for 659 100 million tons (-24.3%). 87.3% of the demand (575 600 tons) came from the vehicle industry. Down by 9.4% compared to the order volume received the year before, the demand of magnesium castings reached a volume of 20 200 tons. Orders for parts made of copper castings reached a volume of 43 600 tons, 40.6% lower than the year before. Foundries producing casted parts from zinc logged an order level of 46 900 tons (-16.0%).

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

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Hungarian Economy 2020

Following a contraction of 5.7% in 2020, GDP is projected to rebound by about 3% per annum on average. Due to new restrictions to contain a second wave of infections in autumn, the recovery was delayed. When restrictions were lifted and the vaccines were deployed, global trade picked up in mid-2021. Therefore, domestic and external demand began to recover from mid-2021 onwards. The bad labour market had similar conditions in 2020 and will be improved from mid-2021 as well, while inflation will continue to be elevated.

Fiscal policy remained supportive as social security contributions are further reduced. Monetary policy has had limited room for further countercyclical action given continued inflationary pressures, which was only partly imported. Phasing out temporary measures to preserve existing businesses in a timely way was needed to enable effective reallocation. In addition to active labour market policies, a longer maximum duration of unemployment benefits (currently limited to three months) would be supported employment transitions to ensure a stronger recovery.

The main economic figures are:

- Unemployment rate 4.5%
- Inflation more than 5%
- Rate of interest 0.6%
- Trading balance – negative
- National dept compared to GDP – increasing, 80%
- Business Sentiment Index – negative, -0.8%
- Consumer Sentiment index – negative, -24.5%
- Company's tax ratio – 9%
- Personal's tax ratio – 15%

The forecasted economic expansion about the Corona pandemic was dramatically decreased. Some 30.000 Hungarians have died in the Corona pandemic.

The gap between GDP and net national income is relatively high, as among Hungary's peers, due to profit remittances.
Employment is shifting towards higher-skilled jobs with the tighter integration of manufacturing into global value chains and the expansion of the service sector.
Wages are rising but remain relatively low.

Health care spending as a share of GDP is relatively low and is expected to remain so in the long run, despite a projected 10-year increase in life expectancy and the demand changes arising from population ageing.

Hungarian foundry industry 2020

2020 meant an unbalanced performance for the national foundry industry but in the end of the year it was better than forecasted. In April and May 2020 most of the foundries had a tremendous reducing in production – some of them were closed for a short time and many of them have reduced the weekly working hours as well. More than 50% of the small and medium foundries avails of wage compensation were given by the government. The situation has started to be improved in September and the second

half of the year was significantly better. The number of employees was reduced dramatically during the 2nd quarter. Therefore, the biggest problem was among the others to recapture the personal. After difficulties in the end of the year the number of employees was more or less the same. One of the biggest problems remain the missing well-educated skilled workers (foundrymen) and university level educated foundry engineers.

The customer orders of second half of the year were increased so much that the result of the Hungarian foundry performance all together was only failed 1.5% to 2.0% compared to 2019. Even the productions of steel, heavy metal, zinc and magnesium castings were stable or only a little bit reduced like during the last years. The situation during the first five months of the year 2021 was improving and the expectations are optimistic.

Table 1: Hungarian casting productions, 2019 - 2020; Value in tons

Denomination	**2019**	**2020**
Grey iron casting	18 016	16 446
Nodular iron castings	36 408	37 375
Compacted graphite iron castings	19 210	20 145
Alloyed iron castings	378	445
Malleable iron castings	3	6
Total iron castings	74 015	74 417
Unalloyed steel castings	1 419	785
Alloyed steel castings	763	1 195
Total steel castings	*2 182*	*1 980*
Aluminium gravity die castings	734	530
Aluminium pressure die castings	49 234	49 759
Aluminium sand castings	73 058	69 024
Total aluminium castings	122 425	119 430
Bronze castings	181	360
Brass castings	302	369
Zinc castings	763	1 662
Other heavy metal castings	48	99
Total heavy metal castings incl. investment cast.	1 294	2 490
Magnesium castings	32	30
Investment casting all together in total, inclusive	250	286
TOTAL	**200 166**	**198 317**

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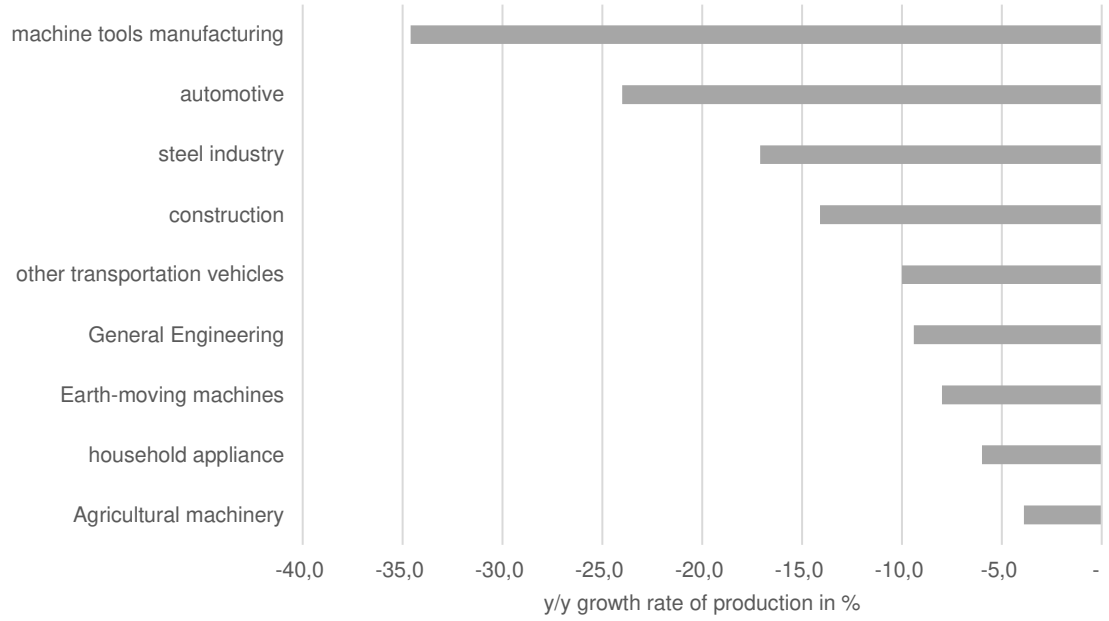
Macroeconomic developments

Last year Italy's GDP recorded its largest drop since the Second World War (-8.9%). The impact of the COVID-19 pandemic was transmitted through various channels: the decline in global economic activity, exports and inbound tourist flows; the reduction in mobility and consumption; and the impact of uncertainty on investment by firms. The contraction in GDP was uneven, with industry seeing a quicker recovery and services weakening once again in the final months of the year.
Consumption (down by 10.7%) suffered due to the restrictions on economic activity. Firms put a brake on their investment plans, causing gross fixed investment to decrease by 9.1%, especially in the non-construction component.
The pandemic had a considerable, but temporary, impact on exports: after falling sharply in the first half of the year, foreign sales picked up pace, returning to pre-pandemic levels in the final quarter.
There was a decisive fiscal policy response to the pandemic, with the introduction of expansionary measures, for the most part temporary: net borrowing rose to 9.5% of GDP, from 1.6% in 2019. Saving as a ratio of gross national disposable income remained unchanged; the reduction in the general government current account balance was matched by the rise in private sector saving, due in part to the accumulation of liquidity for precautionary reasons by non-financial corporations, but above all to the contraction in consumption, including for those households that did not see their disposable income decline.
The consequences for the labour market were substantial, but the recourse to the existing social safety nets and the emergency scheme introduced during the crisis helped to mitigate them considerably.
The steep decline in hours worked was associated with a much more modest decrease in the number of persons in employment.
Job loss was concentrated among self-employed workers and those on fixed-term contracts, especially in the service sector, penalizing in particular young people and women. The health emergency could also have an impact on the demographic trends of the population in the coming decades, affecting both birth rates and migration flows.
The new waves of infection continued to weaken economic activity in the first quarter of 2021; GDP declined by 0.4%, rising in industry and falling in services. The high frequency data, summarized in the weekly GDP indicator prepared by the Bank of Italy, point to signs of a recovery. Rising vaccination rates and the marked improvement in the global economy have bolstered expectations of a robust recovery in the second half of the year.
The outlook is, however, still subject to risks; it will depend on the success of the vaccination campaign in containing the epidemic, on monetary policies remaining expansionary and on the roll-out of the National Recovery and Resilience Plan (NRRP). Fiscal policy continues to be expansionary, even into this year, in order to address the health emergency and prolong the support measures for the production system.
Under the Government's budget, the general government deficit will amount to 11.8% of GDP in 2021; the debt-to-GDP ratio will reach 159.8%, to then fall starting in 2022.
The speed of convergence towards pre-crisis levels will also depend on whether the reforms and the investments set out in the NRRP will translate into actual productivity and growth gains.
The NRRP envisages a wide variety of interventions, which pursue an overall strategy for modernizing the country. In particular, it provides a strong stimulus to the digital and environmental transition of firms and general government and sets out a detailed programme of reforms to resolve some of Italy's structural weaknesses. Gender equality, support for young people and the rebalancing of regional gaps are the three priorities that cut across all the measures proposed.

The situation in the main casting customer industries

In 2020 the main customer industries closed the year with a negative sign respect the 2019, but the loss of their production is very different.

Figure 1: Main customer industries production in % 2020 vs 2019



Source: Assofond Survey

Developments in the ferrous foundry industry

Production

There was a marked contrast in the impact of the crisis across production segments in ferrous metal in Italy, with a widening of differences in companies' performances. The total output for ferrous castings in 2020 was lower than 900 000 tons, a fall of -19.5% and a decrease of more than 216 000 tons compared to the previous year. The overall reduction in turnover was not quite as steep, at -16.1%.
2020 ended with a moderate decline for the steel castings segment (-3.1%), compared to the double-digit reductions seen in all other markets. The investment castings segment suffered most, losing around -32% of its volumes and -26% of turnover. Extending the analysis to the last seven years shows that after the slowdown in 2012 the recovery phase became increasingly difficult, while production in the segment was unable to regain momentum and recapture the tons lost during the 2009 crisis. From 2013 to 2019, ferrous castings volumes had an average annual negative growth rate of -0.4%. It seems likely that issues we continue to define as cyclical are now taking on a more structural dimension. In theory, this would mean a new output benchmark of around one million tons, compared to the pre-crisis average which hovered around the 1.5 million tons mark.

Exports

Export volumes of ferrous castings in 2020 amounted to 386 594 tons, an annual decrease of -21% compared to 2019. In the same period, total imports (460 392 tons) fell at a rate of 10% (-52 639 tons). Export volumes fell by twice as much as imports. This significantly worsened the trade in volume terms, with a shift from -23 000 in 2019 to -74 000 last year.
The contraction in export volumes applied to all geographical and geo-economic areas, and was especially marked for non-EU countries:

- EU 27 (-15%)
- Germany (-15%)
- France (-17%)
- Spain (-26%)
- Non-EU 27 countries (-30%)
- United States (-40%)

The main destinations for exported cast iron remained unchanged, while several differences emerged in the percentage share of some countries on total exports of Italian ferrous castings.
Data for 2020 show an increase in the percentage share of EU 27 countries set against a decrease in non-EU countries.

Cast iron foundries in 2020

For cast iron foundries, 2020 was a difficult year; production fell sharply, although nowhere near the levels seen in the disastrous collapse caused by the 2008-2009 crisis. As the 2018-2019 results show (+1.3% and -12.3% respectively), for cast iron foundries the pandemic came at a time when the outlook was already deteriorating significantly – in part because of the slowdown in the automotive industry. The sudden shock to demand and the interruption to non-essential production supply chains produced a gap in production activities that lasted around a month and a half, between March and April. The first four months of 2020 saw the greatest decline, with an average collapse in production for the period of around 45%, with peaks of approximately -70% during the worst months of the lockdown in March and April. After the August break, at a time of continuing uncertainty in terms of the health crisis, the Italian cast iron foundry sector returned to a gradually accelerating path of growth momentum. This enabled it to gain significant ground in terms of production and restrict declines to percentage levels unimaginable in the first part of the year. On average in 2020, the production of cast iron castings declined by -20.4%, closing at an all-time low of 835 058 tons, half the record levels of 2007 and more than 100 000 tons below the volumes produced in 2009. Production was divided into 534 437 tons of grey iron and 300 621 tons of ductile iron (malleable and spheroidal), with similar results in terms of volume declines: -20% and -21.1% respectively. The percentage share of total cast iron castings output in tons for the two types of cast iron remained largely unchanged compared to the previous year, at: 64% for grey iron castings and 36% for ductile iron.

Destination markets for iron castings

In 2020 the main destination market for cast iron castings remained mechanical engineering. Its percentage share of overall castings production rose by around four percentage points compared to the previous year: 54% against 50% in 2019. Such a large share has never been achieved and can be explained by the steeper reductions seen in other destination markets.
The production of castings for cast iron foundries' largest destination market suffered an overall average fall of -14.6% in 2020, with 450 931 tons produced.
Note that as well as castings for various mechanical and engineering uses, and for machine tools, this market also includes castings used for earthmoving and agricultural machinery.
Last year, the transport market accounted for around 31% of the total output of cast iron castings, about one percentage point down on 2019. 254 693 tons of cast iron castings went to this market in 2020, 25% down on the previous year.

Construction is the third largest market for cast iron foundries and is responsible for around 7% of volumes. An estimated 60 124 tons of castings were produced for this industry in 2020, -19.9% compared to 2019.
In 2020, 29 227 tons were placed in the steel market, down by 11% on 2019.

Steel and investment casting foundries in 2020

In contrast to other production segments, 2020 did not greatly affect the steel castings sector. Production for the year closed with a moderate decline of -3.1%.
Total production of steel castings in the three segments making up our classification based on alloy type – stainless steels (20%), steel alloys (57%) and carbon steels (23%) – fell by 58 000 tons in 2020.
Steel alloy castings account for 57% of the production mix – the largest type. They fell to 33 117 tons (-6.1%); the remaining 43% is divided between carbon steels (23% of the total, 13 528 tons) and stainless steels (20%, 11 356 tons). The latter two categories were able to end 2020 positively: +0.6% for carbon steels and +2% for stainless steels.
From a destination market perspective, our analysis for 2020 essentially shows the same picture as the year before, with the exception of the mechanical engineering industry, which lost a percentage point, and construction, which gained around two points compared to 2019.
Of all customer sectors, the worst performing were the railway and mechanical engineering industries, which recorded a contraction of around -7%; next came the mining and petrochemical industry, with a drop of -4.8%, and steelmaking (-2.3%); positive trends were seen across the remaining sectors – +12.7% for the shipping industry, +5.4% for construction and +2.2% for the automotive industry.
According to Assofond's observatory, the sector comprising investment castings made with lost wax technology produced 1 266 tons in 2020, a collapse of almost -32% in volume terms – the biggest of all segments within the ferrous castings classification.
Results for this segment were hit hard by the impact of the pandemic on one of its biggest destination markets: the aeronautical sector.

Developments in the Non-ferrous foundry industry

Aluminium and copper metals see biggest drop, with more moderate declines for zinc and magnesium.
The pandemic dealt a heavy blow to the whole aluminium supply chain in Italy and Europe. Within this, the foundry alloys segment recorded the biggest losses due to its heavy dependence on automotive customers – a sector already grappling with cyclical issues prior to Covid.
Non-ferrous metal foundries operate in a sector dominated by the production of aluminium castings, which accounts for 82% of total output. The sector was impacted by the negative effect the health crisis had on its main target market, the automotive industry – an industry already struggling prior to Covid, with production down -9.5% annually in 2019, following a drop of -3.3% in 2018. In the past five years, the automotive industry – in Italy and throughout Europe – has faced scandals such as Dieselgate and changes driven by sustainable mobility. These have had inevitable consequences on its traditional market and ability to recover.
The automotive industry has been among those affected most by Covid-19 ever since its early stages, when the effects on the supply chain originating in China began to be felt globally. As well as the halt in production, the sector has also been hit by a lack of demand. Indeed, many consumers, faced with uncertain months ahead, postponed or cancelled purchasing a new car.
In Italy, increased activity levels after the March-April collapse were gradual and mainly involved car production, which began showing positive year-on-year trends again from July.
In this context, given that the automotive industry accounts for around 52% of total Italian non-ferrous castings production (with even higher percentages for aluminium), it is no surprise that this segment ended 2020 down -20.3% on the previous year.
Total revenues for the segment confirm the gloomy picture: €3.6 billion is the estimate for 2020, a fall of -18.7% compared to the previous year. The gap between this and the highest level, reached in 2007-2008, is -26%.

An analysis of the main types of non-ferrous alloys that total production is usually divided into shows that last year's crisis struck aluminium castings and copper alloys hardest. The former contracted by -20.7%, while brass and bronze fell by -20.9%.
Zinc alloys, with a drop in production of -17.7%, came next; followed by magnesium alloys, which at -11.1% escaped the worst.

Destination sectors for Italian non-ferrous castings foundries

The sector's overall downward trend reflected individual declines in the five main industrial sectors for non-ferrous casting products. The biggest impact, in terms of loss of volumes, was felt – as previously stated – by foundries serving the automotive industry. They lost a total of more than 100 000 tons and faced a -23.8% percentage drop; next came electrical engineering, which saw production levels drop by almost 24 000 tons due to a percentage drop of -26.7% – an even sharper fall than for aluminium alloys. 2020 was a particularly difficult year for the construction sector too; it was hit hard by the economic and social crisis unleashed by Covid-19. The shutdown of entire areas of industry and the economy, combined with uncertainty on the part of small and large investors – public and private alike – worsened a situation that had already been showing cause for concern for several years. The sector is the third largest market for the production of non-ferrous castings. Last year, it suffered a decline of -13.3%, leading to a reduction in production of around 16 000 tons compared to 2019. The production of castings for mechanical engineering also went deep into the red in 2020: -17.0% and a loss of more than 12 000 tons.
Although last year's health crisis struck indiscriminately across all sectors of the economy, on average, durable consumer goods – where home appliances and other domestic products feature prominently – held up better against the pandemic, limiting the decline to around -10%.

Raw material development: metallic input

In the first quarter of 2020, raw material prices collapsed as the pandemic's rapid spread led to global uncertainty. After China, its effects were felt all over the world, leading to widespread curbs on transport and a halt to economic activity with immediate and dramatic effects on international trade and markets. The lockdowns also had a significant impact on metal and steel processing supply chains, with large mines – principally in South America, but also in South Africa and Australia – forced to close after workers became infected. Mine shutdowns and the halting of scrap collection meant mineral and metal supply was considerably reduced. Although the impact was not felt in the first part of last year, severe repercussions were to follow.

Pig iron

The decline in the national price lasted until mid-July 2020; it then began a steady rise for the whole second half of the year. The performance of average prices by pig iron type recorded in euro/ton by the Milan Chamber of Commerce assessment is summarised in the table below.

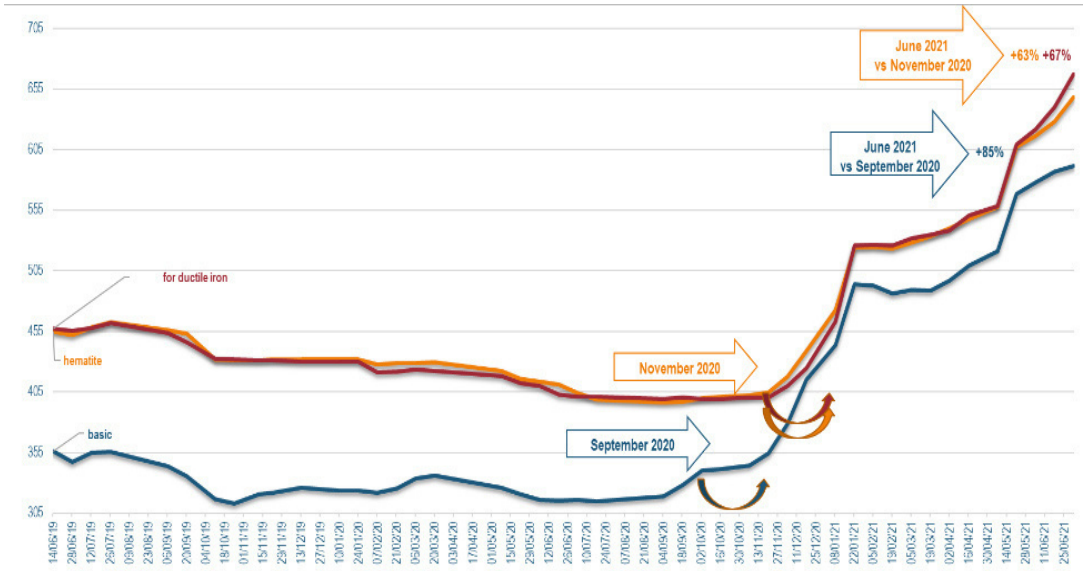
Table 1: Italian pig iron for foundries in %

	1st half 2020	2nd half 2020	Annual 2020
Basic	-3.3	31.9	27.4
Hematite	-8.2	10.7	1.6
Ductile iron	-7.1	6.4	-1.1

Source: Chamber of Commerce of Milan

Since September-November 2020, prices have started to rise without ever stopping. The price curves below show the different phases and the increases from the bottom.

Figure 2: Italian pig iron for foundries in prices €/t



Source: Chamber of Commerce of Milan

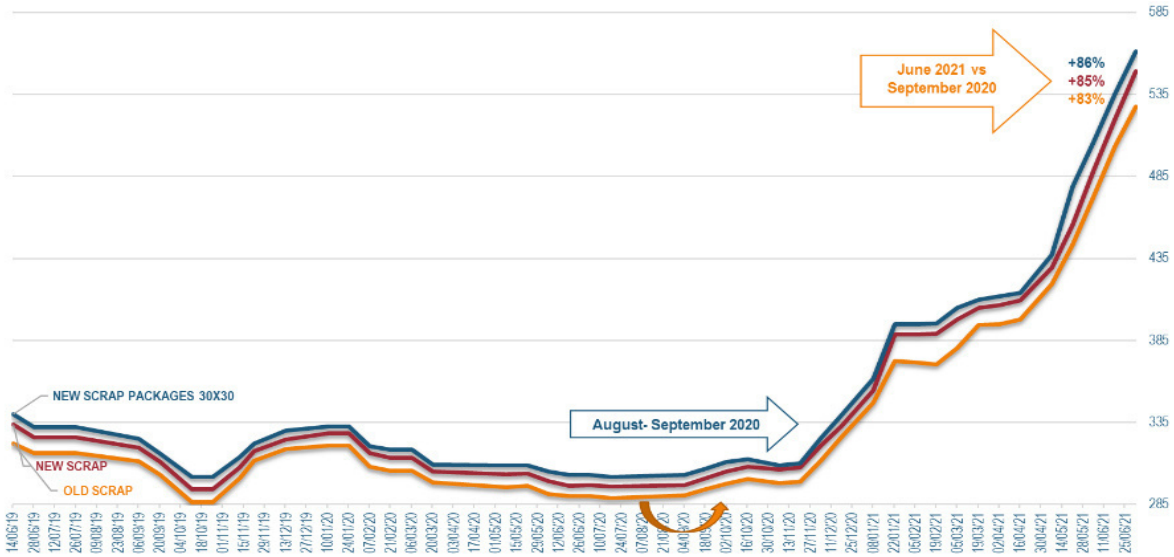
Steel scrap

Table 2: Italian steel scrap for foundries in %

	1st half 2020	2nd half 2020	Annual 2020
Old scrap	-9,4	12,9	2,3
New scrap	-8,8	12,5	2,6
New scrap packages 30X30	-8,5	12,4	2,8

Source: Chamber of Commerce of Milan

Figure 3: Italian steel scrap for foundries in prices €/t



Source: Chamber of Commerce of Milan

Non-ferrous metals

Boosted by the boom in Chinese imports, copper took centre stage in the post-lockdown recovery, but tin, zinc, and nickel also rose on the back of this. The red metal has always been a good barometer for the health of the economy. Steady price rises could therefore mark a historic step change prompted by what may become a decisive industrial catalyst: the energy transition. Even the most pessimistic forecasts suggest that electric cars and new alternatives to generating energy could double current demand for copper and nickel. As this scenario opens up, it makes fertile ground for financial speculators; raw materials traded on official markets, such as metals listed on the London Metal Exchange, make excellent alternative investment opportunities.

Table 3: Industrial non ferrous metal in %

	First-quarter 2020	Post-lockdown result	Annual 2020
Copper	-25.0	72.5	20.8
Tin	-20.5	53.3	21.9
Lead	-18.0	34.3	2.5
Zinc	-22.6	60.2	18.7
Aluminium	-21.0	44.3	9.9
Nickel	-21.0	59.6	18.1

Source: London Metal Exchange

Outlook

Assofond quarterly survey: foundries expect to return to pre-covid turnover levels by the end of 2021. First-quarter data shows a clear improvement in the business of foundries. As for the overall assessment of the sector, we note that the weighted change in turnover, in cyclical terms, shows an aggregate average growth of +16% compared to Q4 2020, confirming the constant progression over the last four periods. Most foundries report an increase in orders in the first period of the year, new models, and customer acquisition. Foundries expect a change in the end of the year of up to +21% compared to 2020. This is particularly significant and will fully recover from the loss recorded in 2020 for 2019 (-17.9%). According to the individual sectors, expectations are diversified: the survey speaks of +22% for cast iron, +23% for non-ferrous metals, +6% for steel. The results, however, are in all three cases above the losses recorded in 2020 (-20.4%, -20.3%, -3.1%, respectively). The growth in turnover is accompanied by a slight increase in the visibility of orders, alongside more significant growth in production capacity and its assessment by entrepreneurs. A further sign of normalisation of the short-term economic framework comes from welfare support. The percentage, although still high, is calculated on the number of companies using at least one active social policy tool and shows a new absolute minimum over the last four quarters (41.7%).

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Economic Developments in Norway

The spread of the COVID-19 virus and infection control measures continue to mark economic developments in Norway. The first lockdown in March 2020 led to mainland GDP falling by around 11% from February to April last year, according to the monthly national accounts. However, activity picked up appreciably towards the summer of last year, and the recovery continued through much of the autumn. The second round of radical infection control measures was introduced in November. The measures were stepped up through January 2021 in the wake of a wave of rising infection, both in Norway and globally. The activity level in January 2021 was 1.5% lower than in February.

Fiscal policy has contributed to reducing the negative impact of the pandemic on the Norwegian economy. In 2020 the Storting (The Norwegian parliament) adopted a number of economic measures and temporary regulatory changes to compensate for loss of household and business income. These measures have substantially increased spending over the government budget. The total amount spent on COVID-related economic measures in 2020 was a whole NOK 131 billion (Euro 12 billion).

There is great uncertainty surrounding near-term economic developments. We have assumed that it will be possible to relax many measures from the summer onwards, but this is contingent on the vaccination programme succeeding in keeping COVID infections under control, including mutated variants of the virus. There is also uncertainty as to how far people will continue in practice to comply with the radical infection control measures. If it is necessary to maintain the radical measures through the summer of this year, the economic slowdown will last longer.

Table 1: Economic trends and forecasts (in %)

	2021	2022	2023	2024
Gross domestic product	3,0	3,9	2,6	1,9
GDP Mainland Norway	3,3	3,6	2,4	2,2
Unemployment rate	4,5	4,2	4,0	3,8
Wages per standard man-year	2,6	3,1	3,3	3,5
Consumer price index	2,7	1,8	1,9	2,1
Housing prices	9,2	3,5	2,8	2,5

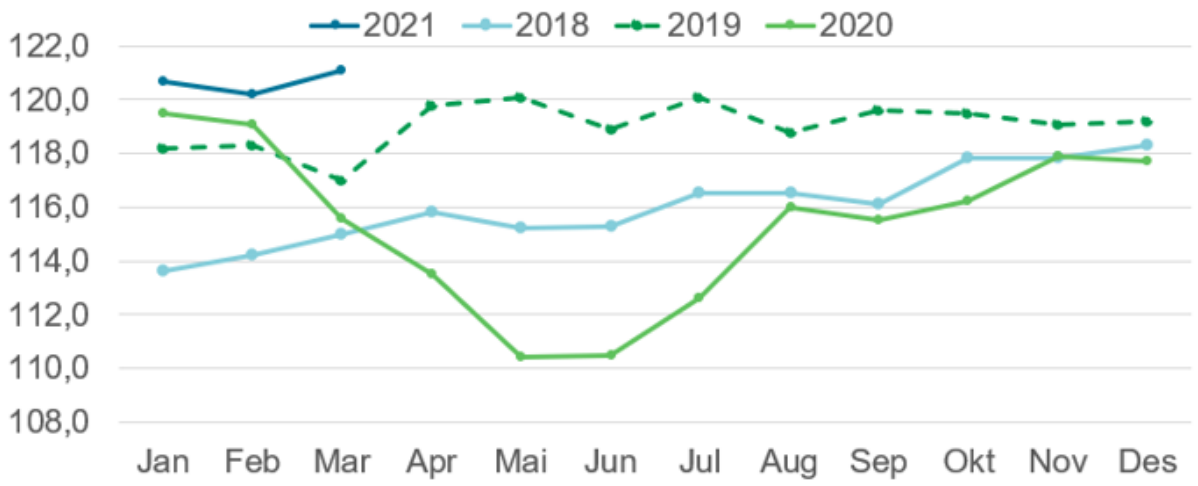
Moderate growth in total stock of orders

The total stock of orders in manufacturing shows a moderate growth in the first quarter, but there are large differences in the development for the different types of goods. Producers of intermediate goods have a sharply increase in stock of orders in the first quarter, while the producers of capital goods report a clear decrease. For producers of consumer goods the stock of orders is unchanged. It was reported a marginal growth in total stock of orders for both the domestic market as well as for the export market in the first quarter. Producers of intermediate goods report a clear increase in new orders in both markets, and the growth is particularly strong in the export market. Producers of capital goods report a decline in new orders in the first quarter, this applies to both the domestic and export markets. For consumer goods, there are different developments for the two markets; here there is growth in the domestic market while there is a decline in new orders from the export market.

Industrial production

There has been an increase in industrial production in the first quarter 2021.

Figure 1: Industrial production (seasonally adjusted, 2005=100)



Source: Statistics Norway, Norsk Industri

Statistics for Foundry production is no longer recorded in Norway.

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Poland's economic performance in 2020

The socio-economic situation of the country in 2020 was influenced by restrictions implemented during the year to counter the COVID-19 pandemic, which affected the results in basic areas of the national economy with varying intensity. The most difficult situation was observed in the second quarter, when, among others, sold production of industry and retail sales slowed down significantly, and also negative trends appeared in the labour market. As a result, the indices in most basic areas of economic activity in 2020 were much weaker than in previous years, followed by the first decline of gross domestic product since the transformation of the economic system.

According to preliminary estimates, gross domestic product in 2020 was in real terms by 2.8% lower than in the previous year (against an increase of 4.5% in 2019). Domestic demand was the main driver of the decrease in gross domestic product. The impact of both investment demand and consumption was negative. Gross value added in the national economy was by 2.9% lower than in the previous year. Gross value added in industry decreased slightly – by 0.2%. In construction, the decline (observed for the second year in a row) amounted to 3.7%. In trade, repair of motor vehicles gross value added dropped by 4.0%.

The situation in the labour market was more difficult than in previous years. For the first time since 2012, the employment in national economy decreased and the average paid employment in enterprise sector was lower than in 2019. After six years of gradual improvement, registered unemployment increased: the number of registered unemployed and the registered unemployment rate since April were above the previous year's level.

Prices of sold production of industry decreased on an annual basis, after the growth in the previous three years. Prices of construction and assembly production grew less than in 2019.

Sold production of industry decreased in annual terms, for the first time since 2009. As regards entities employing more than 9 persons, a decrease was recorded in most sections of industry (except for water supply; sewerage, waste management and remediation activities), including the deepest one in mining and quarrying. Sales were lower than a year before in most main industrial groupings, with the largest decrease in production of capital goods. The growth maintained in production of durable consumer goods and intermediate goods.

For the first time since 2010, total retail sales decreased. In enterprises employing more than 9 persons, retail sales were lower than in the previous year in most groups, including the deepest drop in the groups: textiles, clothing, footwear, motor vehicles, motorcycles, parts as well as solid liquid and gaseous fuels. Sales declined also, among others, in the group food, beverages and tobacco products. At the same time, the increase continued, among others, in the group furniture, radio, TV and household appliances (although it was significantly weaker than in 2019).

The dynamics of foreign trade turnover was visibly weaker than in the corresponding periods of previous years. Exports slightly increased in annual terms; after ten years of growth, a decline in imports was recorded. The total turnover balance was positive, much higher than a year before. Exports to all groups of countries were higher than in the same period of the previous year, whereas imports from Central and Eastern Europe and from developed countries dropped significantly. The terms of trade index in the period of January – October 2020 was more favorable than a year before.

Foundry industry in Poland in 2020

2020 was a first year since 2009 where castings production dropped. It was 20% lower than in the previous year. Estimated data show that the production of castings in Poland in 2020 reached a level of 809 200 tons, divided into:

- Grey iron – 360 000 t
- Ductile iron – 124 000 t
- Steel - 40 000 t
- Aluminum – 272 000 t
- Copper – 4 800 t
- Zinc – 6 000 t
- Other non-ferrous – 2 400 t

In the first economic survey, prepared in spring 2020 by the Foundry Chamber of Commerce, Polish foundries expected an average decline in production by 30%. From March 2020, Polish companies could use many tools and support instruments prepared by the Polish government. These were various types of subsidies, low interest loans, the repayment of which in many cases was cancelled if the company kept the employment level unchanged.

The second half of 2020 brought a slight economic recovery. Moods about future production were already more optimistic. The biggest drops were recorded in foundries, which are suppliers for the automotive industry. In subsequent studies on the expected production volume in 2021, most foundries expected an increase of 10 - 15%. This would mean that a return to production volumes from 2019 would be possible by 2022.

The structure of Polish foundry branch:

- 180 ferrous foundries
- 36 steel foundries
- 240 non-ferrous foundries

More than 90% of foundries belong to SME sector. SMEs are responsible for 40% of total production in Poland.

Export of castings:

- iron castings – 49%
- steel castings – 40%
- non-ferrous castings – 45%

The main markets for Polish castings are:

- Automotive industry – 60%
- Building industry – 10%
- Machines and constructions – 10%
- Iron and steel industry – 10%
- Energy industry – 3%
- Other – 7%

Source: Central Statistical Office - www stat.gov.pl

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General Economic Situation

The year 2020 was a year marked by the COVID-19 pandemic, this disease had profound consequences in the global economy, and Portugal was no exception. The global economy decelerated, mainly in the first half of the year, with a slight recovery in the second half of 2020, although still less when compared with the second half of 2019.

According to the latest results of the INE (National Statistical Institute) in 2020, Gross Domestic Product (GDP) registered a decrease of 7.6%, in relation to the previous year.

Exports of goods and services were the component of overall demand that contributed the most to the recovery of the Portuguese economy that began in 2013. In 2020, with a total export value of 76.1 billion euros (53.8 billion euros in goods and 22.4 billion euros in services), a decrease of 20.4% over the previous year of 2019.

The employment situation

In 2020, the active population in Portugal amounted to 5 165 000 people. The employed population was estimated at 4 814 000 people. The unemployment rate achieved in 2020 6.8% of the active population.

In the foundry area, the demand for specialized technicians, operators and maintenance staff is increasing every year. Companies have difficulties in capturing talent and to keep them in their organizations.

Foundry Industry

The automotive industry keeps being the main customer market, which demands roughly 65% of the global Portuguese production of foundry goods. The Portuguese foundry sector exports 90% of the total production (in weight) mainly to the European market.

Casting Production

In 2020, the outcome of the Portuguese foundry industry was roughly 156 thousand tons, 106 thousand tons from the ferrous sector and 50 thousand tons from the non-ferrous sector.

Table 1: Casting Production

	2019	2019	2020	2020	2020/2019
Ferrous	140 418 t	71.3%	106 338 t	67.9%	**-24.3%**
Non Ferrous	56 527 t	28.7%	50 334 t	32.1%	**-11.0%**
TOTAL	**196 945 t**	**100%**	**156 672 t**	**100%**	**-20.4%**

The steel foundries had a decrease production for the fourth consecutive year. Steel and the nodular iron foundries have decreased their production, too, which was reflected in a global decrease in the ferrous sector of 24.3% against 2019. The non-ferrous sector had a decrease around 11%.

The following table shows the values of the ferrous sector, where, as mentioned above, a decrease can be seen in all sub-sectors.

Table 2: Ferrous Casting Production

	2019	2019	2020	2020	2020/2019
Iron Castings	41 062 t	29.2%	26 093 t	24.5%	**-36.5%**
Nodular Iron	94 419 t	67.2%	76 119 t	71.6%	**-19.4%**
Steel	4 937 t	3.5%	4 126 t	3.9%	**-16.4%**
TOTAL	**140 418 t**	**100%**	**106 338 t**	**100%**	**-24.3%**

In 2020, the non-ferrous metal castings production registered a decrease of 11% mainly due to the light castings. The aluminium pressure diecasting decreased its production in 13.6% compared to the previous year. This decrease was mainly due to the automotive industry needs since this subsector is very dependent on this industry. The zinc alloys (pressure diecasting and gravity die casting) also had a decrease in the production of 12.1% and the copper castings alloys had a decrease of 5%.

Table 3: Non-Ferrous Casting Production

	2019	2019	2020	2020	2020/2019
Light castings	37 009 t	65.5%	31 966 t	63.5%	**-13.6%**
Copper	17 054 t	30.2%	16 203 t	32.2%	**-5.0%**
Zinc	2 464 t	4.4%	2 165 t	4.3%	**-12.1%**
TOTAL	**56 527 t**	**100%**	**50 334 t**	**100%**	**-11.0%**

New casting plants and investments

In 2020 no new foundries were installed in Portugal, although during the year occurred several investments in the existing foundries to increase the process improvement. Global investments in the non-ferrous sector during 2020 was around 20.2 M€, mainly in aluminium foundries. In 2021, the planned investments will decrease for a total amount of 14.6 M€. Global investments in the ferrous sector during 2020 was around 9.6 M€, mainly supported by iron foundries. In 2021, the planned investment will go up to 11.1 M€.

Industrial Cost

In 2019, the price of most raw materials on the ferrous sector was constant throughout the year. Non-ferrous sector: the price of raw materials decreased substantially in the first half year of 2020 caused by the lack of demand from the foundries. This fact led many producers of raw material to stop producing and storing, which would translate into an apparent failure in forecasts by producers in relation to market needs at the beginning of the summer. Thus, the lack of materials in stock, combined with the difficulty of restoring the supply chain, and the typical lack of scrap in periods of recession, led to an escalation in prices at the end of the year.
Ferrous sector: in the first four months of 2020 prices of raw material decreased 10% when compared with prices of the beginning of the year. These prices recovered, having reached its peak in September and, after a decrease during October, it rose again, with an even greater cadence, culminating in a strong price increase at the end of the year.

Electricity – in 2020 there was a decrease in the electricity cost. 2020 showed a decrease of the network access and use tariffs, and a slight decrease in the energy price both responsible for a decrease of the electricity bill for the industrial consumers.

The gas price decreased from 2019 to 2020 due to the decrease of network access and use tariffs of natural gas. This reduction indicates a continuation of the falling trend in natural gas prices for industrial consumers in the last four years. In 2021 this tendency of decrease of gas price will continue.

Incoming orders

The needs of automotive sector suffered a sharp decrease in 2020. The automotive sector was the most affected, with production declines of around 25% compared to last year. Other sectors were not as affected as the automotive sector, with an estimated decrease of 6% in orders, compared to the previous year.

Foundry vocational training

The Portuguese Foundry Industry has its own training and vocational center, CINFU, a partnership with APF-The Portuguese Foundry Association and the Portuguese Institute of Employment and Vocational Training, which has once more made an outmost job training for the foundry men – those in active jobs and those being prepared for future employments. There is also a long partnership with the University of Porto – Faculty of Engineering, for the training of future foundry engineers.

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Slovenian economic activity in 2020 and forecasts till 2022

The COVID-19 pandemic, in combination with strict health and containment measures, markedly affected economic activity in 2020; its impact is also significant in the first quarter of this year. The strict measures to contain the spread of the virus caused a sharp decline in economic activity globally and in Slovenia last year. It was most pronounced in the second quarter, given the closure of businesses in non-essential service activities and activity being hampered in manufacturing and other service activities. Restrictions on movement, limited spending opportunities and high uncertainty significantly reduced the volume of household consumption. With high uncertainty and disrupted global supply chains, international trade shrank sharply, as did investment. Following the considerable recovery of most sectors during the summer months, the deterioration in epidemiological conditions observed from September onwards required a reinstatement of stringent containment measures. Unlike during the first wave, the impact of measures was much more concentrated on service activities, which were restricted or prohibited due to the epidemic, i.e. entertainment, sports, recreational and personal services, accommodation and food service activities and a large part of the trade sector. The decline in activity in these sectors was similar to that in the spring and, as during the first wave, resulted in a substantial fall in household consumption. On the other hand, some other activities, particularly those related to external trade (transportation and manufacturing), but also construction, were significantly less affected in the last quarter and recovered throughout the second half of the year. Investment has also been rising in quarterly terms since the middle of the year, driven especially by rebounding investment in machinery and equipment in the third quarter, and construction investment (both infrastructure and housing) in the entire second half of the year. This, together with a gradual adaptation of businesses and consumers to the new situation, led to a much smaller overall contraction of activity in the last quarter and a smaller drop in GDP in 2020 (-5.5%) than expected in IMAD's Winter Forecast. Similar dynamics in activity to those in the last quarter of 2020 were also observed in the first two months of this year.

After the outbreak of the epidemic, a range of measures to alleviate its negative consequences for the population and the economy and for faster economic recovery were adopted both at the national level and by the ECB and the European Commission. The comprehensive packages of measures significantly mitigated the pandemic-related income losses of the economy and the population, and provided companies with liquidity and support to cope with the negative consequences. They significantly cushioned last year's contraction of economic activity and prevented a collapse of some particularly exposed sectors. It is estimated that GDP would have fallen by at least 4 p.p. more without the measures. The impact of the anti-corona measures will also be crucial this year, first for sustaining, and later in the year, increasingly for a rebound particularly of service activities and the recovery of overall economic activity.

Economic activity in the euro area will recover this year. Last year, economic activity also fell sharply in the euro area (-6.6%), albeit less than expected, mainly due to a smaller contraction in the last quarter. This is partly related to the gradual adaptation of businesses and consumers to the new situation. As in Slovenia, particularly production in the manufacturing sector was higher than expected. Similar dynamics in activity were also observed in the first quarter of this year. This, together with the rapid development of vaccines and better prospects regarding the start of mass vaccination, was reflected in an upward revision of international institutions' forecasts for the euro area in recent weeks. These assume that with a gradual relaxation of containment measures, economic activity should start picking up in the second quarter, and then more vigorously in the second half of the year when the most vulnerable persons and an increasing share of the adult population should have been vaccinated. Driven particularly by private consumption and with support from world trade, euro area GDP is forecast to expand by 3.8% this year and next, thus returning to pre-epidemic levels in 2022. The depth of last

year's decline and the speed of recovery vary significantly across EU countries, reflecting not only the progress of the epidemic and the strictness of containment measures, but also differences in economic structure (particularly the share of tourism) and domestic policy responses. The euro area recovery will continue to be supported by comprehensive stimulus packages in individual countries as well as those agreed at the EU level, increased public investment and accommodative monetary policies.

In the Spring 2021 a GDP growth by 4.6% is forecasted for 2021 and just above the rate for the upcoming year 2022 (4.4%). In 2023, it will expand by 3.3%. The available high-frequency data and confidence indicators indicate that the developments seen at the end of last year are continuing in the first months of this year. No noticeable recovery is yet expected in the first quarter, mainly due to the retention of restrictions on activity in some service sectors. In the second quarter, given the expected improvement in the epidemiological situation, a recovery is also expected in service sectors, which will have a positive impact on growth in overall economic activity. Assuming that, with increased vaccination coverage and thus better containment of the epidemic, containment measures will ease even more in the second half of the year, economic recovery should accelerate by the end of the year. Support from fiscal policy measures at the national and EU levels will continue to play a crucial role, together with monetary policy measures of the ECB. Economic recovery will remain differentiated across sectors. Further growth is expected in manufacturing and construction, as well as in related service activities, which were already less affected during the second wave of the epidemic. Most of these activities should already achieve 2019 levels of activity this year. A relatively strong growth in investment, especially in infrastructure and housing investment, is predicted, while investment in machinery and equipment will recover at a somewhat slower pace amid the still uncertain conditions. Growth in external trade will continue as well, particularly for goods and gradually also for most segments of services. The slowest and longest recovery is expected in those related to tourism. After last year's deep fall, private consumption will also pick up in the spring with a gradual opening of service activities, reflecting growth in disposable income, but also a release of accumulated savings and hence a gradual decline in the household saving rate. This is nevertheless likely to remain significantly higher than in 2019. The expected redemption of tourism vouchers will also have a positive impact. Growth in government consumption will also increase further this year. In the next two years, the recovery will continue. Economic activity is expected to reach the pre-crisis levels of 2019 in 2022, also as a result of the retention of some measures to mitigate the consequences of the epidemic this year.

After the deterioration in 2020, labour market conditions should gradually improve somewhat by 2023, but the average number of unemployed will remain higher than in 2019. In the spring months of 2020, the favourable labour market trend observed for several years was interrupted by the first wave of the epidemic; employment fell sharply while unemployment soared, but the deterioration in labour market conditions was quickly contained by the adoption of measures to preserve jobs. In 2020, employment was thus 1% lower on average, while registered unemployment was 14.6% higher. With the easing of epidemiological conditions, employment will continue to recover gradually this year, while unemployment will remain similar to that last year in the year as a whole. Government measures to continue mitigating the negative impact of the coronavirus crisis on the labour market, particularly in the first half of 2021, are lifted only gradually. In the next two years, employment growth will continue to strengthen amid further economic recovery, but the annual average number of unemployed will remain higher than in 2019.

After last year's deflation, consumer prices will gradually approach 2% growth again, assuming a moderate economic recovery. This year, inflation will average 0.8%. Assuming that the economy gradually recovers, inflation will be driven particularly by higher energy and food prices. Growth in prices of goods and services will remain modest. In the next two years, inflation is set to come close to 2%, largely due to more vigorous growth in goods and services prices in connection with the further recovery.

The greatest risk to the realisation of the forecast is still associated with the epidemiological situation in Slovenia and its most important trading partners; another important factor is a gradual and well-planned lifting of measures for mitigating the consequences of the epidemic. In the event of a prolonged persistence of tight epidemiological conditions, more stringent containment measures due to new waves of infections, also as a consequence of new and more infectious coronavirus mutations or slower progress in vaccination, and thus further major closures of economies, the recovery could be slower than forecast. A longer maintenance or reintroduction of stringent containment measures would have

an even more detrimental impact on service activities. In the event of a major closure of activities, the consequences would also be felt in industry. A premature withdrawal of measures to cushion the consequences of the epidemic could, in deteriorated economic conditions, also lead to higher unemployment and more companies facing difficulties in pursuing their activities. Liquidity problems could turn into long-term insolvency and lead to more bankruptcies. The banking sector could be affected due to an increase in non-performing loans. In the event of a faster permanent improvement in epidemiological conditions or faster-than-expected availability of a vaccine or medicine for fast widespread use, activity could, however, also recover more rapidly than predicted. Another key factor will be the speed and efficiency of the absorption of resources from the new multi-annual financial framework and the Recovery and Resilience Facility in Slovenia and its main trading partners and their targeted use to address the main development challenges.

Situation of foundry industry

The epidemiological factor had a great influence on the Slovenian foundry industry in 2020. The volume of total castings production was 172 840 tons. It is only 88% of the production of 2019, which was 195 609 tons. Grey iron production increased by 1% compared to 2019 (59 294 tons). Ductile iron production was 39 782 tons, which accounts for only 91% in comparison to the year before. Steel and Fe-granulate foundries had a production of 17 579 tons, only 70% of 2019. Non-ferrous metals castings production in 2020 decreased to 53 085 tons. This is only 81% of the 2019 prodution level. Main problems of the industry are, like in other countiries, energy prices, transport problems and increasing raw material prices. The Slovenian foundry industry has a specific export structure, since 85% of the castings are exported to Germany, Austria and Italy.

Sources:

IMAD - The Institute of Macroeconomic and Development
Chamber of Commerce and Industry of Slovenia, Association of Metals and Nonmetals
Slovenian Foundrymen Society

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The Economy in General and Industrial and Metal Sector in particular

Spain's Gross Domestic Product (GDP) in 2020 has fallen by 10.8% compared to the previous year. According to the forecasts of the European Commission, the Spanish GDP will grow by 5.9% in 2021. The strong rebound expected from the second quarter of 2021 should allow Spain's GDP to return to its pre-pandemic level by the end of 2022.

The European Commission estimates that the euro zone economy will grow by 4.3% in 2021, and by 4.4% in 2022. The EU and euro area economies are expected to rebound strongly as vaccination rates rise and restrictions are loosened.

Industrial Sector

In December 2020, the Industrial Production Index (IPI), in its original series, increased by 2.9% compared to the same month of the previous year. The variation rate for 2020 was -9.1%, after the 0.7% registered in 2019. Regarding industrial prices, the annual rate of the general Industrial Price Index (IPRI) in December was -1.4%. Thus, the year 2020 closes with a variation rate of -1.4%. The accumulated Industry Turnover Index for the year 2020 shows a growth rate of -12.2%.

Metal Situation

The Industrial Production of Metal, measured with the Metal Production Index (IPIMET), closes the year 2020 with a growth rate of -14.2% and the turnover decreased by 13%. Exports from the Metal Sector increased 2.2% in December compared to the same month of the previous year. In the accumulated of the year, they fell by 12.8%. On the other hand, Metal imports increased by 5.9% in December, compared to the 0.1% decrease registered in November, with which in the accumulated of the year there is a decrease of 15% compared to the rate of the +2% from the same period of the previous year.

Labour Market

In 2020, there were 360 105 fewer affiliates to Social Security than the previous year and more than 755 616 people affected by ERTES (Record of Temporary Employment Regulation). An interannual rate of -1.86% is registered.

Metal Labour Market

In the accumulated of the year 2020, an annual average of 761 117 affiliates is reached, which represents a variation rate of -2.4% with respect to the average reached in the same period of the previous year. It is noteworthy to note, as of December 31st, only 2% of the workers affected by ERTES belong to industrial companies of the metal sector. According to the Labour Force Survey, the fourth quarter of 2020 records an unemployment rate of 15.2%.

Foundry Sector

The Sector Situation Report elaborated by FEAF as of September 30th, 2020, showed the following scenario. Comparing data 2019 vs. 2020, the occupancy went down from 77.69% to 73.12%. The order book, from January to September 2020 it has decreased –9.31%. Prospects for the 1st semester 2021 are to decrease by 0.67%. Until September 2020, the 63% had carried out an ERTE and 33% were in ERTE at that time.

Iron Casting Section. Automotive Casting

In general, January and February were strong months. In contrast to that, March and April were very stressful months for the enterprises. From June on an important rise started. Many foundries were at full capacity in the last quarter and expected to end the year with stable order books. The pandemic has hit hard for several months. Most of the companies will finish the year strong, but they have dragged the fall that they had. The year did not end as badly as it seemed to happen in the middle of the year. Great uncertainty remains for 2021, although expectations are not bad at all.

Iron Casting Section. Manual Molding

Most foundries have short-term portfolios and there is little visibility of the near future. Wind power sector of medium size parts has fallen during the last quarter of the year. In September 2020 the Machine Tool sector was starting to take off. Regarding to the railway and energy sectors, both were quite stagnant. Many projects have stopped.

Iron Casting Section. Mechanical Molding

The industrial sector is not very animated and the sewers sector has worked with ups and downs. It has to be mentioned that in general, all sectors have been weak. The one that has performed the best has been the truck subsector. Besides, the agriculture sector seems to be starting to pull more. There was uncertainty for 2021.

Stainless Steel

The Naval, Hydro and Offshore sectors have been reasonably well although with less volumes than in 2019. In the same way, the energy, turbine and food sectors have performed relatively well given the current situation, and Nuclear sector has rebounded. On the other hand, the Liquefied Natural Gas sector has suffered a decline during 2020 and the Oil & Gas has been almost collapsed.

Steel Castings. Carbon and alloy steels

In general, all sectors have been low. The Oil & Gas sector has been weak during 2020 and the Naval sector has not worked so badly, although it has had a decline. The railway sector in general has performed fairly well and has therefore fared somewhat better than the other sectors.

According to the Die-Making sector, it has been reasonably good while Construction and Public Works sector is recovering at the end of the year. In the case of Machinery and Mining sectors, developed not as bad as others. Spain is suffering more than other countries.

Non-Ferrous

Aluminum foundries have produced much less than in 2019. The drop has exceeded 20%.
For Zamak, there has been a decrease in 2020 compared to 2019: -13.3%.

Raw Materials prices and Auxiliaries in 2020

Scrap prices ended 2020 with prices higher than those at the end of the previous year (+9.77%), however the average 2020 vs. 2019 registered a decrease of -5.02%. Ingot prices have evolved upwards, being at the end of 2020 well above than those of December a year earlier (+25.30% in the case of pig iron ingot and +19.37% in the case of nodular ingot). The average variation 2020 vs. 2019 has been +2.68% for the basic ingot and -5.69% for the nodular ingot. FeMo has suffered a sharp fall in 2020 compared to the previous one (-19.81% year-on-year average) and Nickel has registered a decrease of -5.34% on annual average. The FeCr has evolved downwards and ended the year 2020 with prices lower than those of December 2019. The ferrosilicon stone has evolved downwards (-1.67% on average). Graphite has had a drop during 2020. Sands have had a rise of 2% in 2020. Shot has also increased its price during the year. The resins, in general, have been quite stable in 2020. Energy prices have decreased considerably in 2020 compared to 2019.

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Economic situation and main indicators for 2020

The year 2020 was a year of many difficulties due to the Corona pandemic. In March, the pandemic had reached Sweden and the virus was spreading throughout society. The pandemic has affected the Swedish economy in large. Sweden has not had a lock down, instead different recommendations were presented by the authorities. At the end of 2020, several restrictions were put in place. To help businesses survive these difficult times the Swedish government presented ways to support companies, for example short-term layoffs, decreased employer taxes etc.

The unemployment rate at the end of the year was 8.8%, compared to 6.8% at the end of 2019. GDP fell with 2.8% during 2020 compared to 2019.

The PMI index (Purchasing Managers Index), in February 2020 was at 52.5 which is above the 50 mark that indicates growth. When the authorities declared that the pandemic was spreading in Sweden the PMI dropped to 43.1 in March and continued to be below 50 during the whole spring. As summer came and the number of confirmed cases declined the PMI in July was at 52 indicating that Swedish industry was once again growing. This has steadily increased and by the end of the year the PMI was 64.9 (Source: Purchasing Managers Index, Swedbank and Silf).

General casting industrial structure

The number of foundries in Sweden remain stable. During the year there has been no bankruptcies or reconstructions. This means that during 2020 we still had just less than 100 foundries (approximately 25 iron foundries, 11 steel foundries and some 60 metal foundries, mainly aluminum). As usual the customer side is dominated by the automotive sector, and nearly 70% of the total production end up in the transport sector as components in trucks, light vehicles, and construction equipment. The automotive sector was highly affected by the pandemic. Some factories stopped production during a period which has had a large impact on the amount of produced goods.

The Swedish foundries have experienced several other difficulties during the past year due to the Corona pandemic. During the year 2020 several of the Swedish foundries have expressed difficulties in meeting new customers due to the travel restrictions. The travel restrictions have also affected the possibility of meeting colleagues from the industry. Throughout the whole industry one of the main problems has been the high level of sick leave. The recommendations in Sweden were and still are, that individuals with symptoms stay at home, this includes children. As co-workers stay at home due to symptoms or childcare it has resulted in difficulties planning the production.

HPDC foundries producing components for the medical sector have seen an increasing demand for components, but very few HPDC foundries in other sectors have been able to switch over to medical components. Since a large number of employees nowadays work partly at home, the demand for cast components for working tables and chairs has shown a great increase.

Production

The total foundry production has decreased during the past year. Due to difficulties in collecting data the presented numbers are an estimation. We believe that the Swedish foundry industry has had a total decrease of approximately 20%. As mentioned previously, several of the mass-producing foundries have had periodical shutdowns.

Reflections about the present situation

The project GRETA - Cast products with resource-efficient manufacturing and business models, is one of several projects with the focus on sustainability that has started during the past year. The project aims at providing Sweden's foundry industry with conditions for a sustainable transition while maintaining competitiveness. The goal of the project is to provide Swedish foundries with tools for sustainable transition through more efficient use of resources. There is a high awareness in the Swedish foundry industry that this change is both necessary and desirable and that it will greatly improve both energy use and carbon footprint as well as the handling of raw materials and residual products.

The interest in climate index for cast components, e.g., EPD (Environmental Product Declaration) has increased during the last year and several foundries and end users are now taking part in projects regarding EPD as a marketing tool and an objective way to select future suppliers.

The Swedish foundry industry has taken the step towards securing future skills supply with the project named SvenskGjutet (Casted in Sweden). The project aims at creating awareness of how important the Swedish foundry industry is for a modern society and to celebrate the everyday heroes who work in foundries. The objective for the Swedish foundry is to be considered as a preferred alternative when future qualified employees apply for jobs.

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Situation of Foundry Industry

The Swiss foundry industry, roughly 80% of which is geared to exports, was predominantly slowed down markedly in 2020 by the restrictions caused by the pandemic. However, the pandemic also gave the continuingly highly innovative and keen-to-invest sector the opportunity to be increasingly considered a local supplier. Innovative «Made in Switzerland» cast parts, sustainably produced to high standards of quality, are again experiencing a boost in regard from potential customers at home and abroad. The economic recovery is creating a cautiously optimistic forecast in 2021.

On the whole, in 2020 the production volume of the 45 companies amalgamated in the Swiss Foundry Association (GVS) was 15% down on the previous year at 35 750 tonnes delivered. In light metal casting the reduction was 20 per cent, in cast iron 13%, and in copper alloys 13%, as shown by the sector association's results figures. In the last year, individual foundries sustained dramatic losses in sales, in some cases up to 35%. A positive highlight: owing to companies being very flexible, solid financial reserves and the «short-time work» instrument, in 2020 there was no major wave of redundancies in the industry, which employs some 2 400 people in total.

The pandemic opened up the opportunity to be increasingly considered a local supplier again. The Swiss foundries' innovative strength to be able to sustainably produce and reliably supply technologically highly developed cast parts with a high standard of quality for use in every sphere of life moved former and new customers to award their orders to Swiss foundries.

In addition, new orders were acquired with innovative cast products for the hygiene and medical sector, as well as for fittings and water treatment plants. For some member companies of the SFA the growing demand from these sectors even created outstanding business results.

In its established key user market of transportation, the Swiss foundry industry also maintained its good position last year, thanks to complex lightweight cast parts to reduce CO_2 emissions and for electromobility. From the fourth quarter 2020, the unexpectedly rapid upward economic trends in the automobile industry, with greater demand for cars and commercial vehicles as well as in the rolling stock market, again created greater utilisation of production capacity in the Swiss foundries.

Even though strongly cyclical, this positive trend is persisting in the Swiss foundry industry this year, despite the lockdowns at home and abroad. The demand from shipping is also continually gaining in impetus. There is not yet any substantial economic recovery perceptible in mechanical engineering. At present, the sectoral leaders of the Swiss foundry industry are cautiously optimistic about the again overwhelmingly well-filled order books until the middle of the year, as shown by a survey among GVS board members. Some firms stopped short-time work even months ago and have ramped up production again in multi-shift operation, especially in die casting for the automobile industry.

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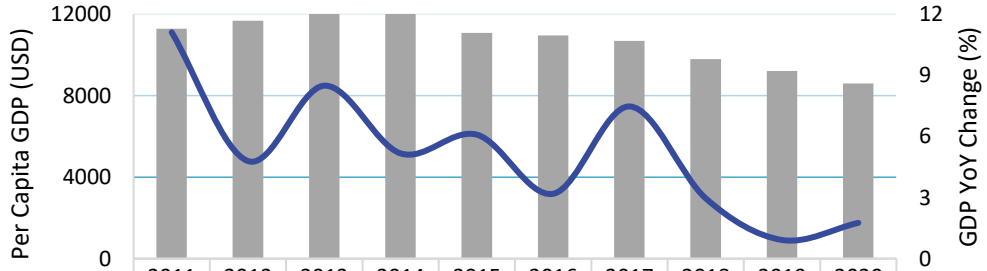
Macroeconomic Developments

The impact of the coronavirus pandemic on economic activity in Turkey has been observed later than in other countries in the region; however, it was strong. After a 4.4% increase in the first quarter, the economy contracted 9.9% on an annual basis in the second quarter, which was the sharpest downturn since the first quarter of 2009. Strong intensive care infrastructure and targeted lockdowns helped to contain the number of COVID-19 cases in the first phase of the outbreak in spring. But easing the containment measures in June led to a sharp increase in autumn, which limited the GDP expansion to 5.9% year-on-year in the fourth quarter after the third quarter's 6.3% rise.

The recovery was driven by the domestic demand, buoyed by credit in the second and third quarters. The stimulus program in the form of partial credit guarantees, tax and loan deferrals, social support payments to households, assistance to furloughed workers, and other support for firms totaled 13% of GDP. Consequently, for the year as a whole GDP rose 1.8% and the Turkish economy was one of the few in the world to achieve growth in 2020, despite the economic fallout from the pandemic. Due to the depreciation of the local currency by 20% against the U.S. Dollar, GDP Per Capita contracted by 6.7%.

Figure 1: Gross Domestic Product and Gross Domestic Product Per Capita



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
GDP Per Capita (USD)	11.289	11.675	12.582	12.178	11.085	10.964	10.696	9.792	9.213	8.599
GDP YoY (%)	11,1	4,8	8,5	5,2	6,1	3,2	7,5	3,0	0,9	1,8

[1] The figures for 2020 are the sum of four quarters; subject to be revised when the annual figures will be published.
[2] GDP Per Capita calculation is based on the mid-year populations taken from the annual results of the Address Based Population Registration System.
[3] GDP YoY is calculated by the production approach in chain-linked volume percentage change [2009=100].
Source: Turkish Statistical Institute

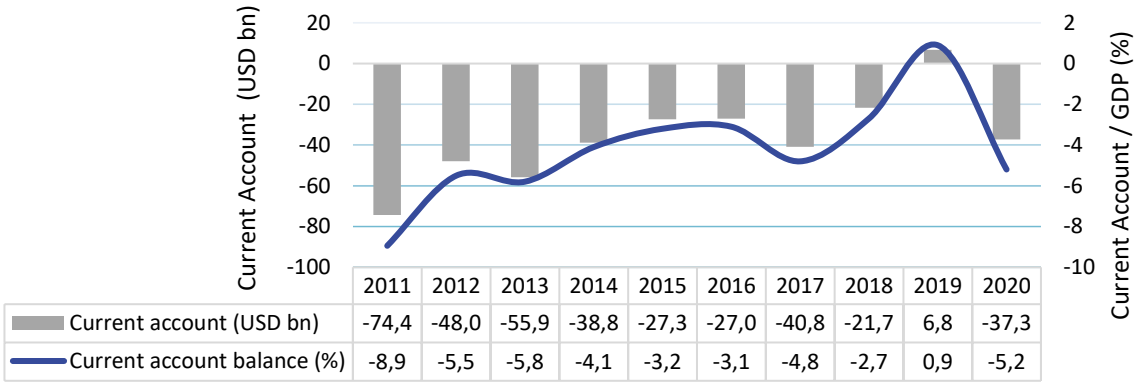
The massive credit expansion promoted by the monetary and quasi-fiscal support yielded an increase in the current account deficit and inflation, together with a sharp exchange rate depreciation. Therefore the government began to scale down these measures in autumn. The current account which was a surplus in 2019 moved back into a deficit of 5.2% of the GDP. Inflation, meanwhile, rose to a 16-month high of 14.6% in December, up from November's 14.0%.

After a 0.7% year-on-year decrease in 2019, industrial production rose 1.6% in 2020 on a calendar-adjusted basis. The decrease in the industrial production of the basic metals manufacturing industry was down by 10.6% year-on-year in 2019 which scaled up by 2% last year.

Except for the first phase of the outbreak, the manufacturing purchasing managers' indices (PMI) stayed above the 50-threshold in 2020, which was the signal of the recovery from 2019's contraction in industrial production despite the impact of the pandemic. After hitting the historical lowest level of 33.4 in April, Manufacturing PMI recorded a historical highest level of 56.9 in July.

The recovery in the real sector confidence continued until the end of the year. The index rose to 110.4 in December which was the strongest reading since February of 2018.

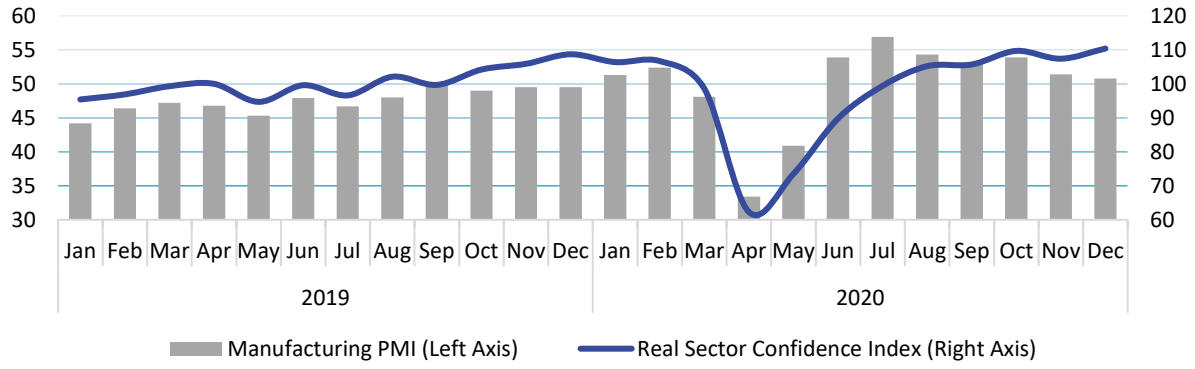
Figure 2: Current Account Balance



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Current account (USD bn)	-74,4	-48,0	-55,9	-38,8	-27,3	-27,0	-40,8	-21,7	6,8	-37,3
Current account balance (%)	-8,9	-5,5	-5,8	-4,1	-3,2	-3,1	-4,8	-2,7	0,9	-5,2

Source: Central Bank of the Turkish Republic of Turkey

Figure 3: Manufacturing Purchasing Managers' Index vs. Real Sector Confidence Index



[1] Real sector confidence indices are seasonally adjusted.
Source: Turkish Statistical Institute; Central Bank of the Republic of Turkey; Istanbul Chamber of Industry; IHS Markit

Business investment remained weak, but job retention programs in the formal sector reduced employment losses. The overall unemployment dropped from 13.2% in 2019 to 12.6% in 2020. However, the unemployment rate for new entrants to the labor market and, in particular, youth gained momentum and reached 25.8%.

The Situation In The Major Casting Customer Industries

In 2020, total motor vehicle production decreased by 10.0%, whereas domestic sales rose 61.8%. The increase in passenger car sales by 57.5% was the main reason for the increase in the domestic vehicle market. Although commercial vehicle production fell by 7.5%, tractor production increased by 59.4%.

The export volume of the general machinery industry decreased slightly by 4.0%, owing to the significant increase in the incoming orders in the second half of the year. The export volume dropped nearly 11% for internal combustion engines and parts; moreover, the contraction in the export of turbine, turbojet, and hydraulic systems reached 14.9%. While electricity motor and generator exports nearly remained stable with a slight decline of 0.9%, pump and compressor exports saw an increase of 1.6% in 2020. The domestic sales in the tractor market are also reported to increase nearly by 50%, while there is a decrease of 13% in the export numbers.

Increasing demand for housing created a robust growth in the construction sector. The annual rise in building permit floor area reached 48.7%, and the total house sales increased by 11.2% compared to the previous year. The annual production and domestic sales of the cement industry rose 26.9% and 22.5%, respectively. Cement export also grew 46.1%.

Steel production increased by 6,0% as compared to the previous year.

The installed capacity in electricity production increased by 5.1% in 2020, while the driving force were the investments in renewable energy resources.

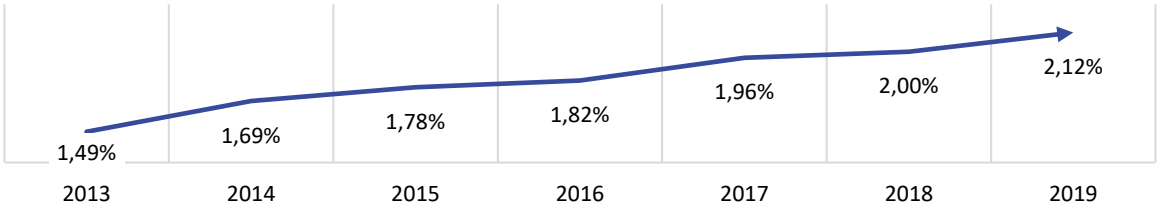
Production in the white goods sector recorded an increase of 3.5% in 2020; with a slight increase of 0.5% in the export volume.

Developments In The Foundry Industry

Industry Overview

According to the most recent statistics published in January 2021, the Turkish Metal Casting industry increased its share in global casting production by 48% in the last six years and became the 2nd biggest producer in Europe during the pre-pandemic era.

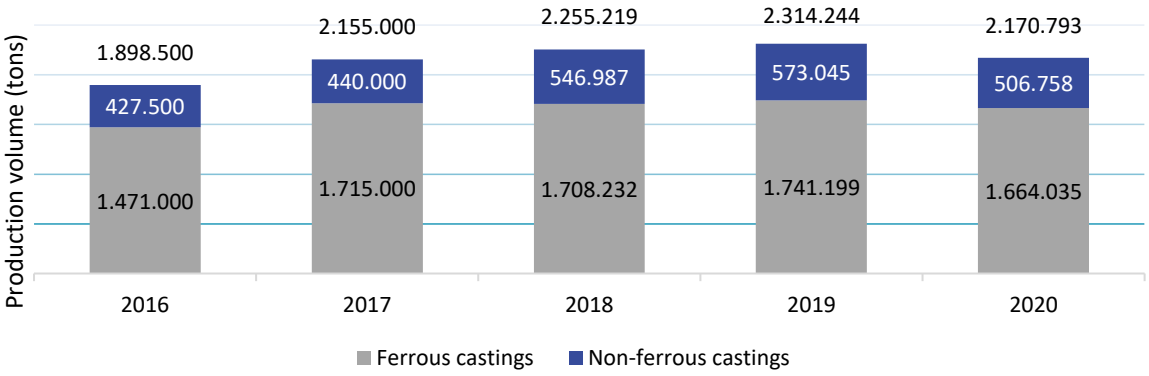
Figure 4: Share of the Turkish Metal Casting Industry in Global Casting Production (in metric tons)



Source: AFS 54th Census, January 2021

The impact of the pandemic was strong in the second quarter of 2020. 74% of the foundries experienced order suspensions or cancellations and short-term production loss reached nearly 48% during this period which yielded a 23.9% loss in the production volume in the first semi-annual period as compared to the previous year.

Figure 5: Annual Metal Casting Production and Changes

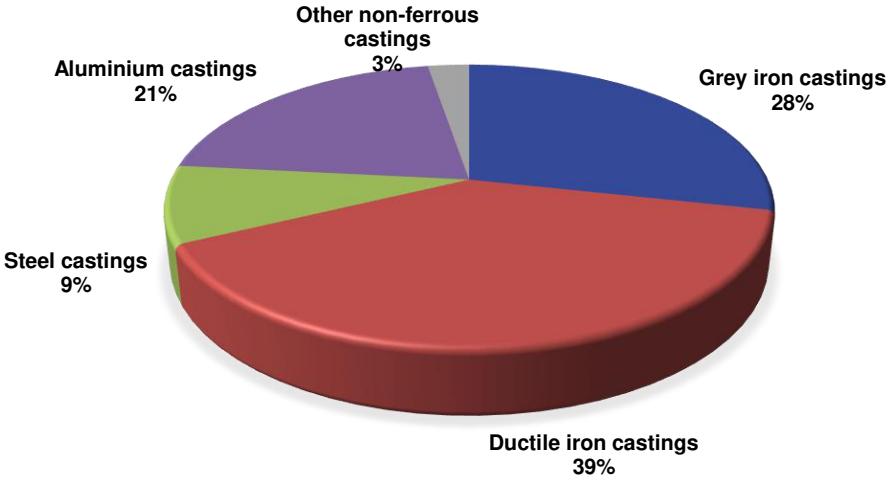


Source: TUDOKSAD – Turkish Foundry Association

The sharp reincrease in the number of COVID-19 cases in the second half of the year did not cause any decline in production, due to the foundries' uncompromised safety measures. Capacity utilization which declined to 53.1% in the first half surpassed the 61% level again and notable production increases were observed, especially in the last quarter. The sector managed to survive the year with a 6.2% loss, and a total production volume of 2.2 million tons.

The contraction was mainly due to non-ferrous castings. Production volume dropped 11.6% to 506.8 thousand tons and the share of non-ferrous castings decreased from 24.8% in 2019 to 23.3% in 2020. Foundries reported a 19.9% decrease in capacity utilization which was recorded as 63.2% for non-ferrous foundries.

Figure 6: Casting Production Distribution (2020)

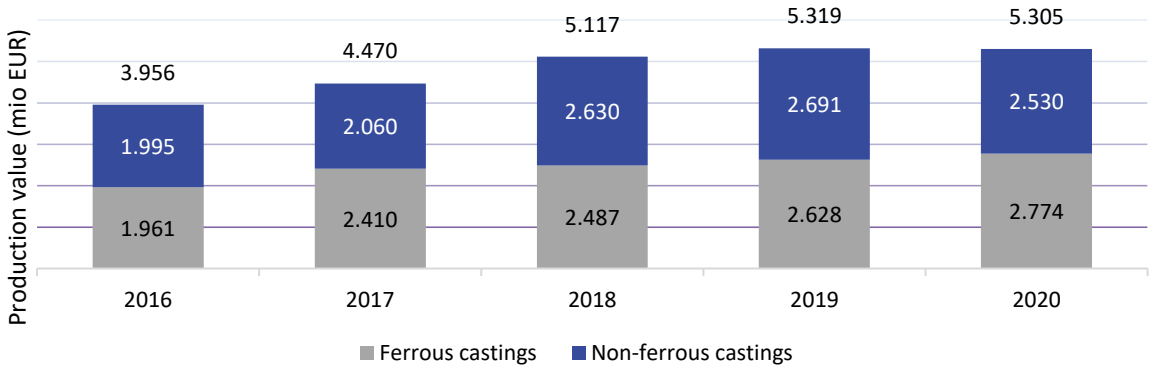


Source: TUDOKSAD – Turkish Foundry Association

The decline in ferrous castings remained 4.4% with a production volume of 1.7 million tons. Capacity utilization for ferrous foundries was realized at 59.5%.

Despite the production loss, the total value of castings followed a stable trend in 2020 and was realized as EUR 5 305 million.

Figure 7: Production Value of Metal Castings



Source: TUDOKSAD – Turkish Foundry Association

On the other hand, export volume decreased more than the decline in production volume. It dropped 7.2% to 1.38 million tons.

Investments

In line with the volatile macro-economic conditions in 2020, the investments in the Turkish foundry industry declined to EUR 49.8 million with a significant, 51.3% decrease as compared to 2019. A substantial part of the investments was put on hold and the actualized investments were mainly aimed at increasing the productivity and automation of the processes.

The Situation in the Material Sectors

Iron Castings

The grey iron castings production nearly remained stable compared to 2019, with a slight increase of 0.5% at 617 320 tons, whilst nodular iron castings production decreased by 8.5% to 854 704 tons. On the other hand, foreign demand presented an opposite pattern which points out the shifts in incoming orders and supply chain networks due to the pandemic. The export ratio of grey iron castings dropped from 62.6% to 47.3% in 2020; however, the export volume of ductile iron castings increased by 12.8% and the export ratio rose to 66.7%.

Over the past years, iron foundries had been allocating their capacities more on nodular castings. Therefore, capacity utilization in grey iron production reached 70.8% despite the stable production volume. It dropped below 55% of the total capacity for ductile iron castings.

Steel Castings

The production volume of steel castings has remained almost unchanged since 2018, which recorded a slight loss of 481 tons and realized as 192 010 tons in 2020. Despite the robust domestic orders, the weakened foreign demand due to the production cut-offs in the global casting buyers resulted in a 23% decrease in the export volume.

The recovery in the mining and energy sectors was slow. On the other hand, the demand from the railway, cement, and defense industries was still strong.

Aluminum Castings

HPDC foundries had yielded strong growth rates in aluminum castings for the past couple of years. In 2020, they recorded a 13% decrease in production which led to a 10.7% drop in total aluminum castings, totaled 449 503 tons, mainly driven by the shrinkage of orders from the vehicle industry. On the other hand, the loss in wheel production was around 8%, which contained the drop in vehicle sector output.

For aluminum castings in general, the export ratio increased to 81.5% but the capacity utilization dropped to 63.5%.

Other Non-ferrous Castings

The decline in the production volume of other non-ferrous metals castings deepened in 2020. 57 255 tons in 2020 was 17.7% lower than the total production in the previous year. The contraction in zinc alloys exceeded 19% which constitutes more than 55% of the non-ferrous metals castings other than aluminum. The export volume and capacity utilization were down by 22.4% and 6% respectively.

Cost Development

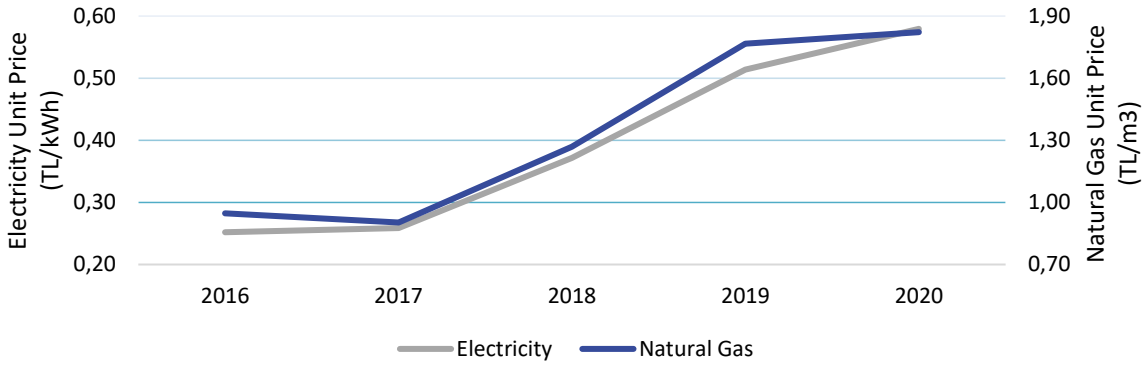
Currency fluctuations highly affect the manufacturing costs of foundries due to the import of raw materials. The situation in 2020 was similar to or worse than the one in 2018 when the currency crisis occurred. The annual TL/USD and TL/EUR year-on-year exchange rate changes were 23.6% and 35.5% respectively. According to the Turkish Statistical Institute, domestic PPI year-on-year change for the casting industry in 2020 was 36.6%.

Energy

Both energy and gas prices in industrial consumption have been increasing sharply since 2018. In comparison with the previous year, the electricity and natural gas market prices for industrial facilities were up 12.7 and 3.1% respectively.

Despite the decreased production volume foundries reported a 13.4% and 17.0% increase in electricity and total energy costs respectively as compared to the previous year.

Figure 8: Electricity and Natural Gas Prices

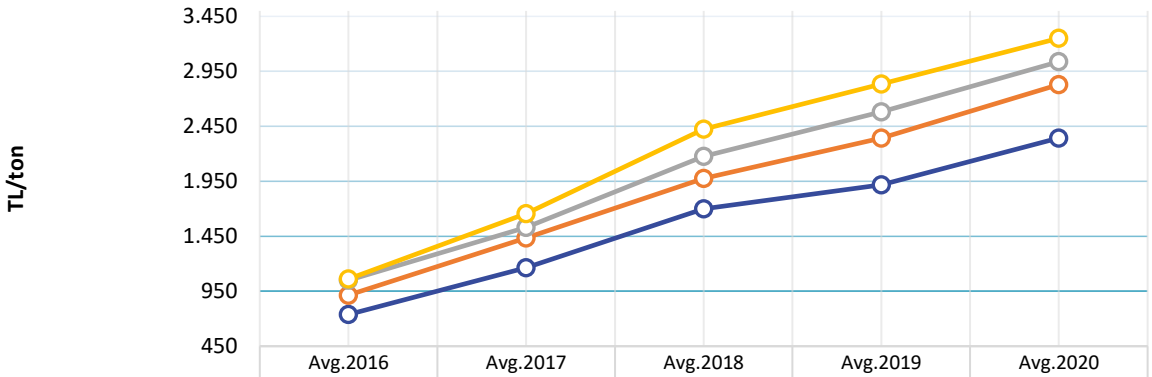


Source: Turkish Statistical Institute

Raw Materials

The constant increase in raw material prices was also maintained in 2020, in the 15-22% range as compared to the previous year.

Figure 9: Raw Material Prices



	Avg.2016	Avg.2017	Avg.2018	Avg.2019	Avg.2020
SCRAP	739	1.165	1.699	1.918	2.344
BASIC PIG IRON	915	1.434	1.976	2.342	2.830
HEMATITE PIG IRON	1.050	1.530	2.178	2.583	3.038
NODULAR PIG IRON	1.062	1.655	2.424	2.836	3.251

Source: TUDOKSAD – Turkish Foundry Association

Foundries reported a similar but slightly lower rise in their raw material costs due to the contraction in the production volume, which was 17.1% higher than the previous year.

Labor

According to the Turkish Statistical Institute, the hourly labor cost index in the manufacturing industry was 17.3% above the previous year's figure. On the other hand, the industry has been suffering from a lack of manpower at different levels, despite the high unemployment and youth unemployment rates (12.6 and 25.8% respectively), thus average payroll costs are higher than the country averages. Foundries reported their labor costs grew by 23% compared to the previous year.

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Economic Situation

UK gross domestic product (GDP) decreased by 9.9% in 2020 to £1.96 trillion, a fall of over £210 billion pounds compared with 2019, which had seen growth of 1.4%(1). The Bank of England had forecast growth of circa 1.6% for 2020 however, at the time of the forecast, the effect of the coronavirus pandemic could not have been predicted. The coronavirus pandemic resulted in multiple lockdowns in the UK in 2020, causing significant damage to many industries and sectors, especially to the service and hospitality sectors, which the UK economy is heavily reliant upon.

The economy shrank by 2.9% in Q1, in part as a follow-on from the UK exit from the EU, but in Q2, when the pandemic struck, the economy shrank by 19%. Q3 did see a very dramatic increase of 16.1% and Q4 a further 1% increase. However, Q4 2020 was still circa -7.8% on the 2019 level. In terms of the UK economy, UK manufacturing currently(2):

- employs 2.7 million people – earning an average of £34,538
- contributes (roughly) 11% of GVA
- good account for £191bn of output
- goods account for 53% of total exports
- represents 65% of business research and development (R&D)
- provides 16% of business investment.

Political Uncertainty and the Pandemic: Effects on Manufacturing

The UK stopped being part of the EU on the 31st January 2020 but throughout 2019 negotiations and discussions were continuing on the withdrawal agreement leading to two extensions of the original exit deadline (of 31st March 2019), a change in the Prime Minister in the early summer and a general election in December 2019. This led to considerable uncertainty continuing into 2020 and this is reflected in some of the UK output figures for 2020, particularly those from the manufacturing sector.

Manufacturing was subject to many restrictions on working in the early stages of the pandemic, but once measures were put into place to mitigate the risk of transmission, manufacturing was encouraged to continue to operate as near to normal as possible. As with most other world nations, the availability of personal protective equipment, sanitising equipment and containers for global shipping all impacted on the ability to produce at pace and this continued into the latter part of 2020, with shipping capacity further forecast to reduce further into 2021.

The oil and gas sectors, along with aerospace and automotive, have been subject to very significant reductions in investments and purchasing both by businesses and domestic consumers. It is anticipated that once the pandemic is over there will be an initial surge in demand for goods, which may result in some availability issues, but that over time overall demand will return to a pre-pandemic level.

Productivity

Productivity in the UK still reportedly lags behind that of other advanced economies and there are also regional differences in productivity levels which are now acknowledged to have contributed to investment inequities that the UK government had pledged to address as part of the 'levelling-up' campaign during the 2019 general election. Current (pre-pandemic lockdown) data suggests that:

- UK output per worker lags around 10-15% behind Germany, France and Sweden, and more than 30% behind the US.
- Certain UK specific industries lag significantly behind their European counterparts, and this drags on the overall performance of the UK in productivity tables.
- Comparative international evidence suggests that relatively low levels of UK investment and R&D spending, combined with a longer tail of companies and workers with relatively low productivity and skills, are the main reasons for this continued productivity shortfall in the UK relative to other advanced economies.

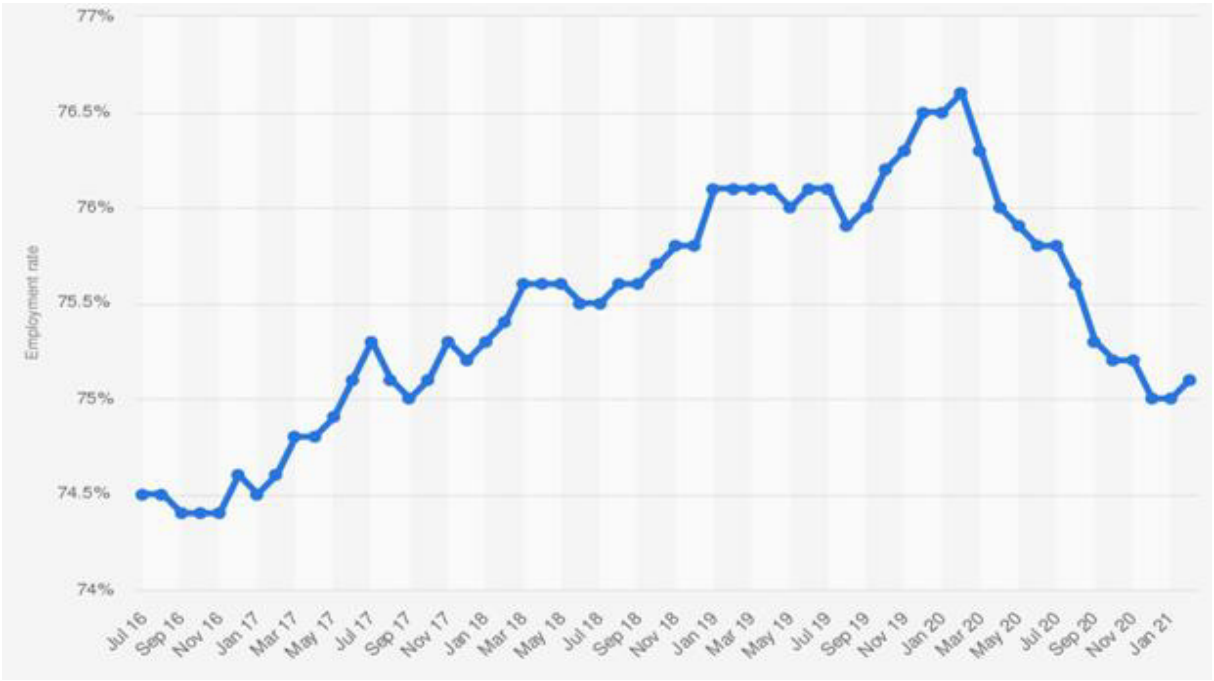
However, a report from the OECD, published in late 2018, commented that the productivity gap is not necessarily as bad as commonly reported, due to inconsistencies in how individual nations have used the best data available to it. The OECD's working paper shows that, when using a more consistent method to compare total hours worked, the UK's labour productivity improves significantly relative to other countries. For example, the UK's productivity gap with the US would reduce by about 8 percentage points, from 24% to 16%, when adopting the simple component method approach.

In the latter stages of 2019 the UK Office for National Statistics[3] stated that it was starting to review the OECD report from 2018 together with subsequent reports, to establish if the UK needed to adjust the way the national body reports data to bring it in line with other nations. It is not known when the results of this work are likely to be published.

Employment

Q1 2020 saw 76.6% employment[4] in the UK. In February 2020 over 31.7 million people were employed, (*Figure 1*). In Q2 and Q3, the employment rate declined due to the arrival of the coronavirus pandemic and societal lockdowns. By December the percentage of people employed in the UK had fallen to 75%.

Figure 1: Employment rate in the United Kingdom from March 1971 to February 2021[4]



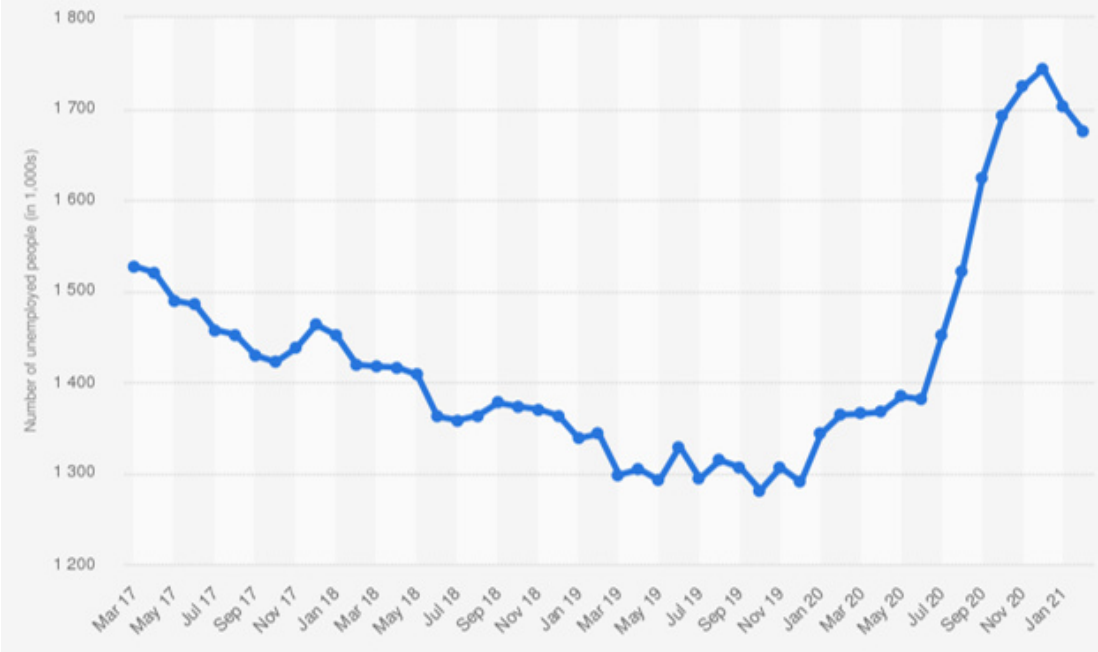
Source: Office for National Statistics UK

In 2020 UK unemployment reached the highest level since August 2016, bought about by the pressures on businesses and workers due to the coronavirus pandemic. Unemployment reached 5% in the quarter leading up to November 2020, (*Figure 2*). This equates to over 1.7 million people being out of work. In February 2020, prior to the pandemic, the unemployment rate was circa 4%. Employers made widespread use of the furlough scheme which helped to prevent a more substantial increase in unemployment.

The use of the furlough scheme continued into 2021, as business confidence took a hit when the UK entered a second lockdown period in November 2020.

In the middle of 2020, over 8.8 million UK workers were on furlough, with most of these in retail and hospitality. Manufacturing and construction, while subject to furlough and redundancies in early 2020, started to return to normal operation for non-office-based people and continued to remain stronger than other sectors, including aviation.

Figure 2: Number of people unemployed in the United Kingdom from March 1971 to February 2021 (in 1,000s)[(5)]



Source: Office for National Statistics UK

Economic Outlook for 2021

At the start of the year economic growth was anticipated to be circa 5% but by the end of Q1 this figure was revised upwards to close to 7%[(6)]. A fall in output in Q1 of 1% rather than 4% as predicted earlier in 2020 was anticipated. A solid recovery was predicted to start to occur after the end of Q2, when it was predicted the lockdown periods and the vaccination programme would allow UK businesses and the service sector to open up at scale. The UK economy is forecast to return towards levels seen in 2019 by the middle of 2022. Unemployment is expected to reach a peak of 5.8%, which suggests the UK will not have lost skills and capability in significant numbers and should have more scope to bounce back more rapidly than thought from the pandemic.

Foundry Industry

2020 was a very challenging year for much of the UK casting and foundry industry. Overall the industry saw an average downturn in order books of -28% in Q1 2020, -37% in Q2 and -35% in Q3, before a minor recovery in Q4 to -23% down against 2019 order book levels.

The automotive and aerospace sectors experienced the most significant reduction in demand for castings due to the closing of air travel and national lockdowns, meaning that purchasing of large items such as cars was put off both by business and households. An increase in commercial vehicle castings was experienced, as online shopping and deliveries became the normal during lockdown periods.

In the early part of 2020 all Cast Metals Federation (CMF) foundry members expected to see their order books decline compared with 2019 levels. It must be noted that for some 2019 had been a significantly better year than experienced for some time, so the overall effect may be that the decline due to covid is not as severe when compared with the 2017/18 period.

Circa 40% of CMF member foundries and 15% of suppliers to the industry were identified as being part of a critical supply chain, either by themselves or by being formally notified by their customer.

Foundries were found to be 'critical' in the commercial vehicle, rail, defence, medical, petrochemical and pharmaceutical sectors as well as in critical infrastructure projects including road building, rail, power generation, shipping and infrastructure construction.

The rapid change in volumes for the automotive and aerospace sectors was also a significant factor for the decline in order books for several members in the diecasting and investment casting sectors.

The rail sector, general engineering and oil/gas varied in terms of volumes of work through the middle of the year. Since the beginning of September most sectors appear, to have recovered well, based on information received in CMF member meetings, but order books became quieter as the end of the year approached.

Order books for suppliers mirrored the changes for foundries for the whole period.

Throughout 2020 CMF members were asked to offer information about their capacity utilisation and how it compared with 2019 levels. The average capacity being used was 70.4% which was on average down 18.5% on the previous year.

The range of capacity utilisation was 30% to 100% and the figures for individual members remained static throughout the period. The range (comparing 2020 performance to 2019) was from +60% to -60%, which again remained constant for each individual member who submitted data during this time.

Foundries of all sizes, metals cast and processes were affected by the turndown with the exception of one who due to the nature of the parts produced and their customer base, continued to operate at >100% throughout the year and since the start of the pandemic.

The two lockdown periods and the impact on the major OEM's created a lot of disruption in the supply chain, so there is no overall pattern for a pick-up in work across the broad spectrum of customers to UK foundries.

Employment in the Sector

As in previous years, many foundries reported that both finding the right calibre of staff and being able to retain new staff continued to be a problem in all types of foundries. Workers from overseas, who are typically from eastern Europe, continued to be less inclined to come to the UK.

2020 saw an increase in the number of companies that were taking on apprentices using the new foundry apprentice programmes – these are supported by national government funding through an

industry levy charged on larger businesses. The apprentice training is then free for smaller companies with an annual wage bill of less than £3M per annum.

The National Foundry Training Centre which opened its doors in late 2018/early 2019, continued to see a slow but steady rise in the number of foundries that were sending their apprentices to it.

However, a significant number of foundries reported they also struggled to find apprentices, so attracting new talent into the industry remains challenging.

Closures and Consolidation

During 2020, despite the considerable uncertainty in manufacturing, very few foundry closures or consolidations took place in the UK. 5 iron foundries and 4 aluminium foundry ceased trading, while 1 steel foundry was sold. None of the foundries that ceased trading did so in response to the pandemic, but due to other trade and employment issues. Finding skilled staff to operate production equipment in foundries remained a challenge for some and contributed to some closure decisions. Competition with other foundries and imports were also a factor in several of the closures, along with changes to the automotive sector with the transition towards EV's and away from traditional internal combustion engines.

Costs and Raw Material Prices

By the middle of the year members were reporting that some costs were increasing, including for logistics, for a number of reasons such as lack of transport and container capacity. Some raw materials, including IPA increased quite significantly in price due to a lack of production capacity, demand for it for medical use and also shipping capacity being impacted.

Throughout the pandemic prices for personal protective equipment (PPE) climbed, for some quite significantly due to a shortage of supply of the right grade of equipment and as the supply priorities changed to needs within the National Health Service and care sectors. Costs for additional cleaning, sanitising and reorganising of workplaces contributed to an increase in operating costs. In some cases, shift patterns had to be changed to enable sites to remain fully operational but with reduced numbers of employees on site at any one time.

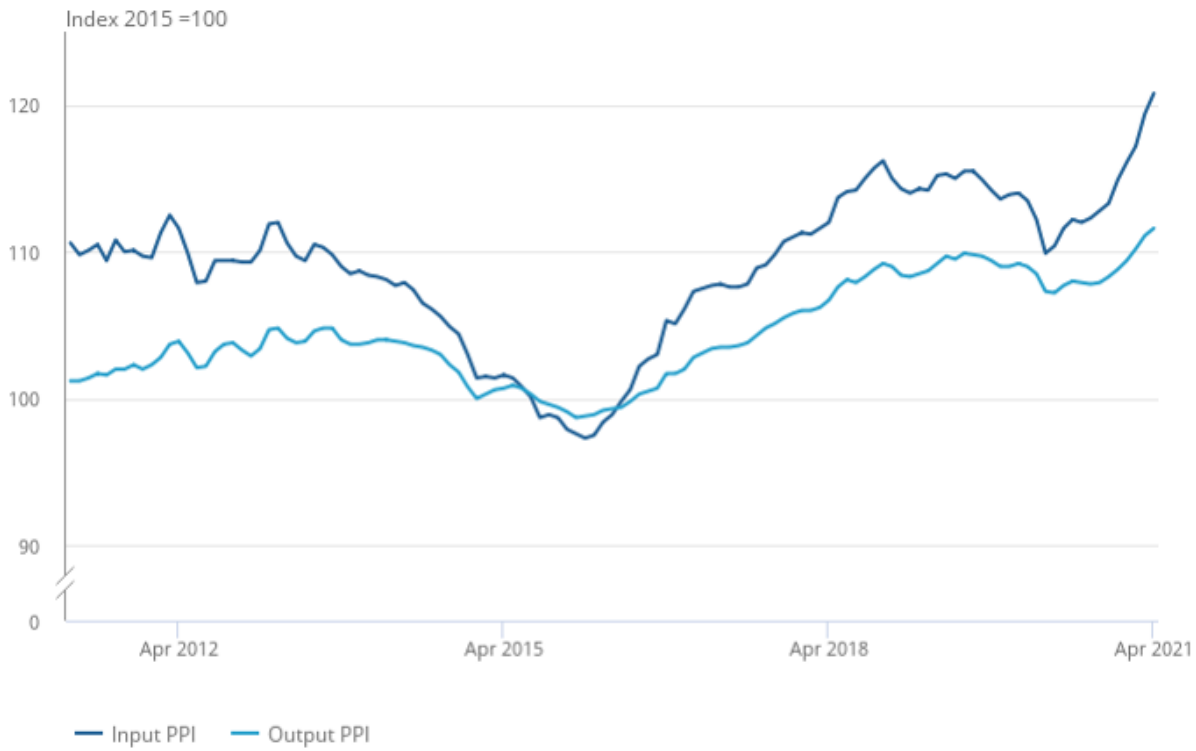
Waste disposal costs increased due to available capacity and transport costs from certain geographic areas.

At a time when business expenses for both foundry and supplier members were increasing, in a small number of cases customers were reported to be seeking price reductions, and significant ones in a few instances.

Quarters 3 and 4 saw significant increases in energy costs for some members and a small number of other members were subjected to penalties for not taking the amount of power agreed in their contracts ('take or pay' clauses being invoked). Insurance costs rose for a few and increases in wage costs in the devolved nations also impacted some members.

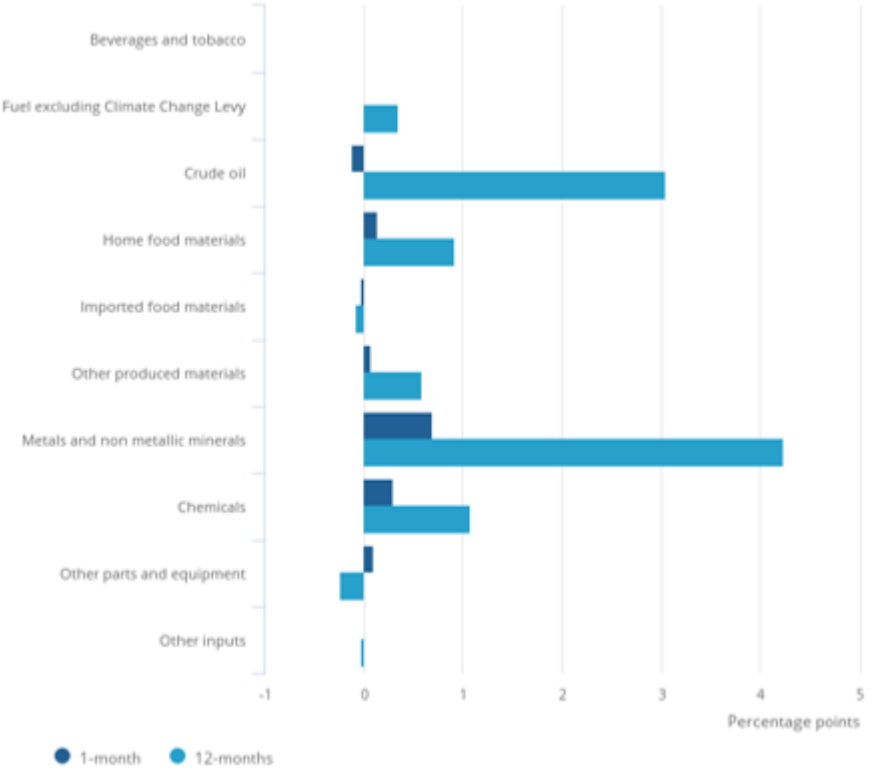
Foundry salaries and wages were generally stable during 2020 with either a freeze or only modest increases of between 1 and 2.5%.

Figure 3: Input producer price inflation (PPI) and output inflation



Source: Office for National Statistics UK

Figure 4: Input producer price inflation of different sectors



Source: Office for National Statistics UK

Outlook for 2021

The industry outlook for 2021 is positive as the effects of Brexit become clearer and the pandemic is bought under control, albeit with a cautionary note that the potential for resurgence of outbreaks and variants that defeat the current vaccines available remain a potential factor.

The investment casting sector, which produces a large volume of castings for the aerospace sector remains under significant pressure, due to the unknown opening of international travel. Given there are a large number of aircraft not flying, it may be that replacement castings are taken from those that will not return to the air. However, continued investment in increasingly efficient jet engines could negate this effect if new designs for aircraft engine parts influence manufacturing.

Both light and heavy commercial vehicles have continued to see an increase in registrations due to the effect of the pandemic resulting in more goods being purchased online and home delivery increasing, which is expected to continue well into 2021, but there is still significant concern for the aviation sector, as most aircraft remain grounded.

Cast Metals Federation members are reporting planned orders from customers returning in 2021 especially in the automotive and general engineering sectors, although aerospace is forecast to remain flat for the foreseeable future, with predictions that it may take until 2024 or beyond to see a normal level of commercial aircraft orders.

Sources:

1. Statistica, https://www.statista.com/statistics/281744/gdp-of-the-united-kingdom/#:~:text=GDP%20of%20the%20UK%201948%2D2020&text=The%20gross%20domestic%20product%20of,economy%20was%202.17%20trillion%20pounds.
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6. EY ITEM Club, https://www.ey.com/en_uk/growth/ey-item-club/why-the-uk-economy-looks-well-placed-for-a-post-pandemic-recover

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TABLES

IRON, DUCTILE IRON AND STEEL CASTINGS

Table 1
Total production in 1000 t - Iron, Steel and Malleable iron castings

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria	154,8	156,6	164,2	158,5	134,7	-3,4	-15,0
Belgium	51,5	42,9	85,2	67,6	52,4	-20,7	-22,5
Bulgaria		49,8					
Croatia	42,9						
Czech Rep.	270,8	295,0	295,5	268,5	192,5	-9,1	-28,3
Denmark	72,8	83,5	91,5	86,9		-5,0	
Finland	57,9	66,4	64,6	57,8	47,1	-10,5	-18,7
France	1.263,7	1.330,9	1.339,9	1.304,3	1.067,4	-2,7	-18,2
Germany	3.919,0	4.184,9	4.256,2	3.804,9	2.714,8	-10,6	-28,7
Hungary	83,4	82,3	88,3	76,2	76,4	-13,7	0,3
Italy	1.152,4 b)	1.235,0 b)	1.253,1	1.108,9	893,1	-11,5	-19,5
Norway	30,1	29,4	31,2	31,2		0,0	
Poland a)	696,0	690,0	690,0	655,0	524,0	-5,1	-20,0
Portugal	140,6	144,6	145,4	140,4	106,3	-3,4	-24,3
Slovenia	202,6	195,1	137,4	177,2	116,7	28,9	-34,2
Spain	1.116,9	1.128,7	1.135,7	1.113,3	931,1	-2,0	-16,4
Sweden	230,3	236,7	248,6	240,4	197,2	-3,3	-18,0
Switzerland	59,1	60,4	61,0	26,3	22,8	-56,9	-13,2
Turkey	1.471,0	1.715,0	1.708,2	1.741,2	1.664,0	1,9	-4,4
United Kingdom	345,0	378,7	413,6	414,2	365,6	0,1	-11,7
Total CAEF	**11.360,8**	**12.105,9**	**12.209,8**	**11.472,8**	**9.106,1**	**-6,0**	**-19,8**

a) estimated b) without investment castings

Table 2
Production value in Mio. € - Iron, Steel and Malleable iron castings

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria	395,3	408,6	427,3	431,8	382,4	1,1	-11,4
Belgium			165,0				
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland	160,4	156,4	203,0	177,7	142,8	-12,5	-19,6
France	2.710,0	2.767,0	2.862,0	2769,0	2.388,4	-3,2	-13,7
Germany a)	6.631,8	7.151,7	7.510,5	6.875,0	5.465,3	-8,5	-20,5
Hungary	212,0	206,0	235,0	226,0	232,0	-3,8	2,7
Italy	2.447,0	2.608,5	2.055,4	1.979,0	1.709,0	-3,7	-13,6
Norway	56,8	65,8	36,0	36,0		0,0	
Poland					816,0		
Portugal	263,8	264,4	265,5	253,2	210,5	-4,6	-16,8
Slovenia					136,6		
Spain	1.884,0	1.922,0	1.949,0	1.913,0	1.731,0	-1,8	-9,5
Sweden							
Switzerland							
Turkey	1.961,3	2.410,2	2.486,6	2.628,2	2.774,4	5,7	5,6
United Kingdom b)	1.770,0	1.800,0	1.944,0	1.950,0	2.340,0	0,3	20,0
Total CAEF							

a) foundries > 50 employees, turnover b) using exchange rate 1£ -1.18€

Table 3
Number of foundries (Production units) - Iron, Steel and Malleable iron castings

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria	23	23	15	15	15	0,0	0,0
Belgium	15	15	13	13	13	0,0	0,0
Bulgaria		80					
Croatia	32						
Czech Rep.	71	71	71	71	70	0,0	-1,4
Denmark	8	8	8	8		0,0	
Finland	18	18	16	18	16	12,5	-11,1
France	120						
Germany	243	240	239	232	225	-2,9	-3,0
Hungary	35	34	29	39		34,5	
Italy	189 a)	191 a)	185 a)	172	172	-7,0	0,0
Norway	9	7	5	5		0,0	
Poland	216	215	215	215	216	0,0	0,5
Portugal	31	31	31	31	31	0,0	0,0
Slovenia	11	57	13	11	11	-15,4	0,0
Spain	74	75	75	71	74	-5,3	4,2
Sweden	39	38	38	36	36	-5,3	0,0
Switzerland	17	17	17	15	15	-11,8	0,0
Turkey	544	546	546	550	556	0,7	1,1
United Kingdom	216	212	210	207	202	-1,4	-2,4
Total CAEF	**1.911**	**1.878**	**1.726**	**1.709**	**1.652**	**-1,0**	**-2,6**

a) including investment casting

Table 4
Employment in the foundry industry - Iron, Steel and Malleables iron castings

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria	2.905	2.971	2.257	2.215	2.158	-1,9	-2,6
Belgium	1.066 b)	1.193 b)	1.757	1.766	1.727	0,5	-2,2
Bulgaria		4.382					
Croatia							
Czech Rep.	11.000	11.000	11.000	10.500	9.500	-4,5	-9,5
Denmark	914	1.095	1.079	1.047		-3,0	
Finland	1.242	1.318	1.363	1.264	1.170	-7,3	-7,4
France	13.300						
Germany a)	41.844	41.774	42.019	39.675	35.385	-5,6	-10,8
Hungary	1.980	1.920	3.850	3.720	3.620	-3,4	-2,7
Italy	14.047 c)	9.182	9.248	9.040	9.432	-2,2	4,3
Norway	850	640					
Poland	16.000	16.000	16.000	16.000	11.125	0,0	-30,5
Portugal	2.381	2.640	2.444	2.582	2.181	5,6	-15,5
Slovenia	1.400	1.418	1.135	1.110	1.277	-2,2	15,0
Spain	10.980	11.070	10.928	11.162	10.808	2,1	-3,2
Sweden	4.746			7.000	7.000		0,0
Switzerland	1.116	1.070	1.058	1.012	1.012	-4,3	0,0
Turkey	20.020	20.500	20.100	20.100	20.500	0,0	2,0
United Kingdom	15.000	14.500	14.600	14.150	13.850	-3,1	-2,1
Total CAEF	**160.791**	**142.673**	**138.838**	**142.343**	**130.745**	**2,5**	**-7,5**

a) foundries >50 employees b) only workmen c) including investment casting

Table 5
Direct exports total in 1000 t - Iron, Steel and Malleable iron castings

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria							
Belgium							
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland	23,8	25,3	21,4	14,5	13,9	-32,6	-3,9
France	471,4	451,3	433,2	448,0	384,3	3,4	-14,2
Germany	1.525,7	1.630,6	1.669,8	1.553,6	1.046,2	-7,0	-32,7
Hungary	53,8	58,0	53,2	45,1	64,9	-15,2	43,9
Italy	488,0	473,7	520,9	488,4	386,6	-6,3	-20,8
Norway	16,8	14,8	16,1	16,1		0,0	
Poland	313,6	311,9	311,9		253,0		
Portugal	121,4	136,7	137,0	128,0	97,7	-6,6	-23,6
Slovenia							
Spain	681,1	704,0	746,8	746,7	621,8	0,0	-16,7
Sweden	47,7						
Switzerland							
Turkey	813,5	961,5	1.024,3	1.086,6	981,2	6,1	-9,7
United Kingdom							
Total CAEF	**4.556,8**	**4.767,7**	**4.934,7**	**4.527,0**	**3.849,5**	**-8,3**	**-14,7**

IRON CASTINGS

Table 6
Total production in 1000 t - Iron castings

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria	42,4	42,9	43,0	42,3	33,4	-1,5	-21,1
Belgium	26,9	26,9	69,9	55,9	43,0	-20,1	-23,1
Bulgaria		30,3	29,9				
Croatia	31,1						
Czech Rep.	158,0	176,0	176,5	166,5	117,0	-5,7	-29,7
Denmark	20,4	27,5	29,6	28,9		-2,6	
Finland	15,3	19,5	18,4	18,2	17,3	-1,2	-4,9
France	531,5	574,1	597,4	537,2	431,9	-10,1	-19,6
Germany	2.234,9	2.421,4	2.435,6	2.189,0	1.618,7	-10,1	-26,1
Hungary	21,7	24,6	22,0	18,4	16,5	-16,5	-10,6
Italy	714,2	755,8	767,6	667,8	534,4	-13,0	-20,0
Norway	10,9	8,3	8,8	8,8		0,0	
Poland a)	484,0	480,0	480,0	450,0	360,0	-6,3	-20,0
Portugal	39,4	41,5	43,4	41,1	26,1	-5,3	-36,5
Slovenia	139,7	195,1	106,5	130,5	59,3	22,5	-54,6
Spain	379,9	365,7	357,6	362,6	283,1	1,4	-21,9
Sweden	159,6	159,4	161,7	154,9	126,0	-4,2	-18,7
Switzerland	35,4	36,5	36,7	9,3	8,4	-74,7	-9,8
Turkey	650,0	720,0	603,0	614,3	617,3	1,9	0,5
United Kingdom	125,8	138,0	144,9	144,5	128,4	-0,3	-11,1
Total CAEF	**5.778,7**	**6.200,5**	**6.132,6**	**5.640,0**	**4.420,7**	**-8,0**	**-21,1**

a) estimation

Table 7
Production value in Mio. € - Iron castings

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria							
Belgium							
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland	28,7	35,4	37,7	34,4	31,9	-9,0	-7,1
France							
Germany a,b)	5.541,2	6.048,9	6.348,4	5.721,0	4.519,9	-9,9	-21,0
Hungary							
Italy							
Norway	10,2	10,3	11,0	11,0		0,0	
Poland					816,0		
Portugal	57,6	66,3	73,6	68,1	50,7	-7,5	-25,6
Slovenia					108,9		
Spain b)	1.539,0	1.583,0	1.622,0	1.537,0	1.338,0	-5,2	-12,9
Sweden							
Switzerland							
Turkey	675,0	745,2	607,3	626,0	765,6	3,1	22,3
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 domestic 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	2019									42,3
	2020									33,4
	in %									-21,0
Belgium	2019									55,9
	2020									43,0
	in %									-23,1
Czech Rep.	2019									166,5
	2020									117,0
	in %									-29,7
Denmark	2019									28,9
	2020									
	in %									
Finland	2019					3,5	4,8	1,9	8,0	18,2
	2020					3,3	5,0		8,9	17,3
	in %					-5,5	4,4		11,3	-5,1
France	2019									537,2
	2020									431,9
	in %									-19,6
Germany	2019						417,7	1.514,4	256,9	2.189,0
	2020						302,4	1075,7	240,6	1618,7
	in %						-27,6	-29,0	-6,3	-26,1
Hungary	2019									18,4
	2020									16,5
	in %									-10,6
Italy	2019		31,9			13,8	319,0	222,8	80,4	667,8
	2020			29,3	12,5		286,5	166,1	40,1	534,4
	in %						-10,2	-25,4	-50,2	-20,0
Norway	2019			6,5			0,3		2,1	8,8
	2020									
	in %									
Poland	2019									450,0
	2020									360,0
	in %									-20,0
Portugal	2019		1,2	1,6			1,3	34,3	2,8	41,1
	2020		1,1	0,9			1,1	20,1	2,9	26,1
	in %		-6,1	-44,5			-8,9	-41,4	4,1	-36,5
Slovenia	2019									130,5
	2020									59,3
	in %									-54,6
Spain	2019									362,6
	2020	2,8		11,3			34,0	229,3	5,7	283,1
	in %									-21,9
Sweden	2019									154,9
	2020									126,0
	in %									-18,7
Switzerland	2019									9,3
	2020									8,4
	in %									-10,0
Turkey	2019	12,3	12,0	66,3	21,1	16,1	213,0	230,9	42,8	614,3
	2020	12,1	11,9	68,6	21,8	17,0	213,2	230,2	42,6	617,3
	in %	-1,2	-0,8	3,4	3,3	5,6	0,1	-0,3	-0,4	0,5
United Kingdom	2019									144,5
	2020									128,4
	in %									-11,1

Table 9
Number of foundries (Production units) - Iron castings (incl. nodular and malleable castings)

Country	2016	2017	2018	2019	2020	2018 / 17 in %	2019 / 18 in %
Austria	20	20	12	12	12	0,0	0,0
Belgium	10		5	5	5	0,0	0,0
Bulgaria							
Croatia	26						
Czech Rep.	71		56	56	55	0,0	-1,8
Denmark	8	8	8	8			
Finland	11	11	11	11	11	0,0	0,0
France	86						
Germany a)	148	151	150	144	140	-4,0	-2,8
Hungary	28	27	27	27		0,0	
Italy	140	139	147	134	134	-8,8	0,0
Norway	6	5	5	5		0,0	
Poland	185	180	180	180	180	0,0	0,0
Portugal	23	23	23	23	23	0,0	0,0
Slovenia				11	8		-27,3
Spain	45	46	46	42	43	-8,7	2,4
Sweden	27	26	26	25		-3,8	
Switzerland	15	15	15	13	13	-13,3	0,0
Turkey	439	441	441	443	447	0,5	0,9
United Kingdom							
Total CAEF	**1.288**	**1.092**	**1.152**	**1.139**	**1.071**	**-2,1**	**-2,7**

a) foundries >50 employees, end of the year

Table 10
Employment in the foundry industry - Iron castings (incl. nodular and malleable castings)

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria							
Belgium	570						
Bulgaria							
Croatia	2.125						
Czech Rep.	7.000						
Denmark	914	1.095		1.047			
Finland	768	741	800	724	645	-9,5	-10,9
France	10.370						
Germany a)	35.170	35.006	35.398	34.096	29.496	-3,7	-13,5
Hungary					3.450		
Italy	6.984	6.869	6.990	6.736	7.119	-3,6	5,7
Norway	743	640					
Poland	12.500	12.500	12.500	12.500	8.010	0,0	-35,9
Portugal	1.762	1.815	1.848	2.064	1.684	11,7	-18,4
Slovenia				1.110	1.066		-4,0
Spain	8.585	8.752	8.600	8.800	8.182	2,3	-7,0
Sweden	3.477						
Switzerland	984		951	910	910	-4,3	0,0
Turkey	13.520	14.000	13.600	13.600	13.875	0,0	2,0
United Kingdom							
Total CAEF	**105.472**	**81.418**	**80.687**	**81.587**	**74.437**	**1,1**	**-7,6**

a) foundries >50 employees, end of the year

Table 11
Direct exports total in 1000 t - Iron castings (incl. nodular iron castings)

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria							
Belgium							
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland	22,6	23,8	18,5	12,9	11,9	-30,4	-7,5
France	450,8	432,4	409,4	429,2	371,2	4,8	-13,5
Germany a)	1.450,5	1.551,4	1.589,0	1.455,2	978,2	-8,4	-32,8
Hungary	51,7	55,9			64,9		
Italy							
Norway	16,8	14,8	16,1	16,1		0,0	
Poland	297,0	295,9	295,0		237,0		
Portugal	115,7	132,5	133,3	124,3	94,6	-6,8	-23,9
Slovenia							
Spain a)	631,7	655,2	696,4	693,0	569,6	-0,5	-17,8
Sweden	46,9						
Switzerland							
Turkey	680,0	833,5	875,8	936,8	862,0	7,0	-8,0
United Kingdom							
Total CAEF	**3.763,8**	**3.995,5**	**4.033,5**	**4.382,1**	**3.189,5**	**8,6**	**-28,4**

a) incl. malleable iron castings

DUCTILE IRON CASTINGS

Table 12
Total production in 1000 t - Ductile iron castings (Nodular and Malleable iron castings)

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria	101,8	102,9	109,7	104,7	91,7	-4,6	-12,4
Belgium	7,2	8,4	7,8	5,1	3,9	-34,8	-23,5
Bulgaria		9,2					
Croatia	11,8						
Czech Rep.	51,8	55,0	57,0	50,0	34,5	-12,3	-31,0
Denmark	52,5	56,1	61,9	58,1		-6,2	
Finland	33,5	36,3	36,2	29,3	23,1	-19,0	-21,1
France	675,2	696,3	682,1	711,4	593,6	4,3	-16,6
Germany	1.509,9	1.587,7	1.636,0	1.433,7	957,1	-12,4	-33,2
Hungary	57,9	54,5	63,4	55,6	58,0	-12,3	4,2
Italy	381,2	425,1	428,6	381,3	300,6	-11,0	-21,1
Norway	19,2	21,1	22,3	22,3		0,0	
Poland	166,2	160,0	160,0	155,0	124,0	-3,1	-20,0
Portugal	93,4	97,2	96,8	94,4	76,1	-2,4	-19,4
Slovenia	31,0	38,6	46,6	46,7	39,8	0,2	-14,9
Spain	671,4	698,1	711,6	663,0	582,8	-6,8	-12,1
Sweden	49,5	55,6	64,0	62,0	51,0	-3,1	-17,7
Switzerland	22,8	22,8	22,1	14,7	11,9	-33,5	-18,8
Turkey	655,0	825,0	912,9	934,4	854,7	2,4	-8,5
United Kingdom	178,5	196,0	219,5	220,5	195,6	0,4	-11,3
Total CAEF	**4.769,6**	**5.145,9**	**5.338,5**	**5.042,3**	**3.998,4**	**-5,5**	**-19,4**

Table 13
Production value in Mio. € - Ductile iron castings (Nodular and Malleable iron castings)

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria							
Belgium							
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland	70,1	54,7	89,2	71,5	52,0	-19,8	-27,4
France							
Germany a)							
Hungary							
Italy			1.602,6				
Norway	46,6	55,5	25,0	25,0		0,0	
Poland							
Portugal	152,3	155,4	150,4	143,5	121,7	-4,6	-15,2
Slovenia							
Spain a)							
Sweden							
Switzerland							
Turkey	885,0	1.155,0	1.304,5	1.382,5	1.401,2	6,0	1,4
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	2019					104,7
	2020					91,7
	in %					-12,4
Belgium	2019					5,1
	2020					3,9
	in %					-23,3
Czech Rep.	2019					50,0
	2020					34,5
	in %					-31,0
Denmark	2019					58,1
	2020					
	in %					
Finland	2019		19,6	9,6		29,3
	2020		20,9		2,2	23,1
	in %		6,5			-21,1
France	2019					711,4
	2020					593,6
	in %					-16,6
Germany	2019		469,6	554,4	409,8	1.433,7
	2020		317,5	427,0	212,6	957,1
	in %		-32,4	-23,0	-48,1	-33,2
Hungary	2019					55,6
	2020					58,0
	in %					4,3
Italy	2019	43,2	208,8	116,1	13,1	381,3
	2020	30,8	164,4	88,6	16,8	300,6
	in %	-28,6	-21,3	-23,7	27,8	-21,2
Norway	2019		2,2		20,1	22,3
	2020					
	in %					
Poland	2019					155,0
	2020					124,0
	in %					-20,0
Portugal	2019	8,4	1,1	82,8	2,1	94,4
	2020	7,5	0,8	66,2	1,6	76,1
	in %	-10,2	-29,0	-20,1	-23,4	-19,4
Slovenia	2019					46,7
	2020					39,8
	in %					-14,8
Spain	2019					663,0
	2020	128,2	151,5	291,4	11,7	582,8
	in %					-12,1
Sweden	2019					62,0
	2020					51,0
	in %					-17,7
Switzerland	2019					14,7
	2020					11,9
	in %					-19,0
Turkey	2019	127,7	270,4	414,7	121,6	934,4
	2020	116,4	248,4	392,5	97,5	854,7
	in %	-8,8	-8,2	-5,4	-19,9	-8,5
United Kingdom	2019					220,5
	2020					195,6
	in %					-11,3

STEEL CASTINGS

Table 15
Total production in 1000 t - Steel castings

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria	11,3	10,8	11,4	11,4	9,6	0,0	-16,1
Belgium	17,4	7,3	7,5	6,6	5,5	-11,4	-16,5
Bulgaria		10,4					
Croatia	0,0						
Czech Rep. a)	61,0	64,0	62,0	52,0	41,0	-16,1	-21,2
Denmark							
Finland	8,4	6,2	10,1	10,4	6,7	3,0	-35,9
France	57,0	60,4	60,4	55,7	41,9	-7,8	-24,8
Germany	174,2	175,8	184,7	178,2	138,0	-3,5	-22,6
Hungary	3,8	3,1	2,8	2,2	2,0	-22,4	-9,3
Italy	57,0	54,1	56,9	59,9	58,0	5,2	-3,1
Norway							
Poland a)	50,5	50,0	50,0	50,0	40,0	0,0	-20,0
Portugal	7,8	5,9	5,3	4,9	4,1	-6,2	-16,4
Slovenia	32,0	30,2	2,1		17,6		
Spain	65,6	64,9	66,6	71,4	65,3	7,2	-8,5
Sweden	21,2	21,8	22,9	23,5	20,2	2,6	-14,0
Switzerland	1,1	1,1	2,3	2,3	2,5	4,0	8,7
Turkey	166,0	170,0	192,4	192,5	192,0	0,1	-0,2
United Kingdom	40,7	44,7	49,2	49,2	41,6	0,0	-15,3
Total CAEF	**775,0**	**780,6**	**786,5**	**770,2**	**686,0**	**-2,1**	**-13,2**

a) estimated

Table 16
Production value in Mio. € - Steel castings

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria							
Belgium							
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland	60,7	66,3	76,1	71,9	59,0	-5,6	-18,0
France							
Germany a)	1.090,6	1.102,8	1.154,3	1137,2	945,4	-1,5	-16,9
Hungary							
Italy			452,8				
Norway							
Poland							
Portugal	54,0	42,7	41,6	41,6	38,2	0,1	-8,2
Slovenia					27,7		
Spain	345,0	339,0	327,0	376,0	393,0	15,0	4,5
Sweden							
Switzerland							
Turkey	401,3	510,0	574,8	619,7	607,6	7,8	-2,0
United Kingdom							
Total CAEF							

a) foundries >50 employees, turnover

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	2019					11,4
	2020					9,6
	in %					-15,8
Belgium	2019					6,6
	2020					5,5
	in %					-16,4
Czech Rep.	2019					52,0
	2020					41,0
	in %					-21,2
Finland	2019	5,1	0,4		4,9	10,4
	2020	2,5			4,1	6,7
	in %	-50,8			-15,2	-35,9
France	2019					55,7
	2020					41,9
	in %					-24,8
Germany	2019	46,8	13,6		117,8	178,2
	2020	23,6	9,9		104,5	138,0
	in %	-49,6	-27,1		-11,3	-22,6
Hungary	2019					2,2
	2020					2,0
	in %					-10,0
Italy	2019	10,5	3,0	1,4	44,9	59,9
	2020	9,8	3,1	1,5	43,6	58,0
	in %	-6,9	2,3	2,5	-2,7	-3,2
Poland	2019					50,0
	2020					40,0
	in %					-20,0
Portugal	2019	2,3	0,3	0,1	2,2	4,9
	2020	2,3	0,3	0,1	1,5	4,1
	in %	-2,8	-10,8	-11,7	-31,8	-15,8
Slovenia	2019					
	2020					17,6
	in %					
Spain	2019					71,4
	2020	45,0	2,6	15,7	2,0	65,3
	in %					-8,6
Sweden	2019					23,5
	2020					20,2
	in %					-14,0
Switzerland	2019					2,3
	2020					2,5
	in %					13,0
Turkey	2019	70,4	21,1	26,0	75,0	192,5
	2020	70,2	20,8	26,0	75,0	192,0
	in %	-0,2	-1,7	0,1	0,0	-0,3
United Kingdom	2019					49,2
	2020					41,6
	in %					-15,4

Table 18
Number of foundries (Production units) - Steel castings

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria	3	3	3	3	3	0,0	0,0
Belgium	5		8	8	8	0,0	0,0
Bulgaria							
Croatia	5						
Czech Rep.			28	28	27	0,0	-3,6
Denmark							
Finland	7	7	7	7	7	0,0	0,0
France	34						
Germany a)	42	41	40	41	39	2,5	-4,9
Hungary	9	7		12			
Italy	37	37	38	38	38	0,0	0,0
Norway	3						
Poland	36	35	35	35	36	0,0	2,9
Portugal	8	8	8	8	8	0,0	0,0
Slovenia			5		3		
Spain	29	29	29	29	31	0,0	6,9
Sweden	12	12	12	11		-8,3	
Switzerland	2	2	2	2	2	0,0	0,0
Turkey	105	105	105	107	109	1,9	1,9
United Kingdom							
Total CAEF	**337**	**286**	**320**	**329**	**311**	**2,8**	**0,7**

a) adjusted data, foundries >50 empl.

Table 19
Number of persons employed total - Steel castings

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria							
Belgium	496						
Bulgaria							
Croatia	168						
Czech Rep.							
Denmark							
Finland	474	577	563	540	525	-4,1	-2,8
France	3.050						
Germany a)	6.674	6.768	6.621	6.657	5.889	0,5	-11,5
Hungary					170		
Italy	2.369	2.313	2.258	2.304	2.313	2,0	0,4
Norway	107						
Poland	3.500	3.500	3.500	3.500	3.115	0,0	-11,0
Portugal	619	825	596	518	497	-13,1	-4,1
Slovenia			352		211		
Spain	2.395	2.318	2.328	2.362	2.626	1,5	11,2
Sweden	1.269						
Switzerland	132	130	107	102	102	-4,7	0,0
Turkey	6.500	6.500	6.500	6.500	6.625	0,0	1,9
United Kingdom							
Total CAEF	**27.753**	**22.931**	**22.825**	**22.483**	**22.073**	**-1,5**	**-3,5**

a) foundries >50 empl.

Table 20
Direct exports total in 1000 t - Steel castings

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria							
Belgium							
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland	1,1	1,5	2,9	1,6	2,0	-45,8	25,0
France	20,6	19,0	23,8	18,8	13,1	-21,0	-30,5
Germany	75,2	79,1	80,8	83,6	67,6	3,5	-19,1
Hungary	2,1	2,1					
Italy							
Norway							
Poland	15,7	16,0	16,0		16,0		
Portugal	5,7	4,1	3,7	3,7	3,1	-1,4	-14,8
Slovenia							
Spain	49,4	48,8	50,4	53,7	52,2	6,7	-2,9
Sweden	0,9						
Switzerland							
Turkey	125,5	128,0	140,5	149,8	119,2	6,6	-20,5
United Kingdom							
Total CAEF	**296,1**	**298,5**	**318,1**	**311,2**	**273,2**	**-2,2**	**-17,4**

NON-FERROUS METAL CASTINGS

Table 21
Total production in 1000 t - Non-ferrous metal castings

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria	147,1	148,3	163,4	144,8	121,4	-11,4	-16,1
Belgium	0,8		2,2	1,0	1,7	-52,6	59,9
Bulgaria							
Croatia	24,8						
Czech Rep.	119,0	122,0	124,2	116,0	94,5	-6,6	-18,5
Denmark	3,9	4,4	4,0	3,5		-11,4	
Finland	4,8	5,9	5,5	5,3	4,1	-3,9	-21,9
France	362,2	367,3	441,3	392,4	330,7	-11,1	-15,7
Germany	1.248,8	1.206,1	1.176,7	1.019,2	769,4	-13,4	-24,5
Hungary	123,3	127,7	139,2	124,0	121,7	-10,9	-1,9
Italy	805,4	860,3	867,5	827,3	659,2	-4,6	-20,3
Norway a)	6,4	5,9	6,5	6,5		0,0	
Poland	348,8	346,5	346,5	356,5	285,2	2,9	-20,0
Portugal	50,5	54,1	56,5	56,5	50,3	0,0	-11,0
Slovenia	52,1	52,1	70,6	75,7	53,1	7,3	-29,9
Spain	163,5	166,7	153,1	153,9	124,6	0,5	-19,1
Sweden	61,5	63,7	67,3	65,1	56,4	-3,2	-13,4
Switzerland	16,2	15,4	17,0	15,9	13,6	-6,5	-14,4
Turkey	427,5	440,0	547,0	573,0	500,4	4,8	-12,7
United Kingdom	141,7	152,1	166,3	165,8	120,1	-0,3	-27,6
Total CAEF	**4.108,2**	**4.138,4**	**4.354,8**	**4.102,6**	**3.306,4**	**0,9**	**-19,2**

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

Table 22
Production value in Mio. € - Non-ferrous metal castings

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria	997,5	1.079,9	1.123,4	973,7	811,7	-13,3	-16,6
Belgium							
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland	55,9	62,5	62,1	51,0	45,2	-17,9	-11,3
France	2.707,0	2.876,0	2.727,0	2.373,0	1.882,6	-13,0	-20,7
Germany a)	5.764,9	5.962,5	6.067,6	5.570,8	4.710,5	-8,2	-15,4
Hungary	387,0	396,0	395,0	387,0	390,0	-2,0	0,8
Italy	4.174,0	4.712,0	4.680,0	4.390,0	3.569,0	-6,2	-20,5
Norway				51,0			
Poland	61,0	58,0	51,0				
Portugal				381,1	324,7		-14,8
Slovenia	317,1	325,8	334,9				
Spain				1.020,0	803,0		-21,3
Sweden	896,0	960,0	951,0				
Switzerland							
Turkey				2.690,8	2.530,4		-6,0
United Kingdom	1.995,0	2.060,0	2.628,7	1.050,0	950,0	-60,1	-9,5
Total CAEF							

a) foundries >50 employees

Table 23
Number of foundries (Production units) - Non-ferrous metal castings

Country	Total		thereof: Pressure die casting		Other Light casting		Other Heavy metal alloy casting	
	2019	2020	2019	2020	2019	2020	2019	2020
Austria	23	22						
Belgium	6	6						
Bulgaria								
Croatia								
Czech Rep.	37	37						
Denmark	7							
Finland	14	13	5	5	5	4	4	4
France								
Germany	330	327						
Hungary	33	31	21	19	9	8	3	4
Italy	864	866						
Norway	3				3			
Poland	240	240		240				
Portugal	57	57	28	28	12	12	17	17
Slovenia	47	47						
Spain	52	52		35		17		
Sweden	60							
Switzerland	31	31						
Turkey	394	396	297	301	60	60	37	35
United Kingdom	199	195						
Total CAEF	**2.397**	**2.320**	**361**	**628**	**110**	**101**	**67**	**60**

Table 24
Employment in the foundry industry - Non-ferrous metal castings

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria	3.923	4.127	5.029	4.718	4.380	-6,2	-7,2
Belgium	262	266	496	496	494	0,0	-0,4
Bulgaria		280					
Croatia							
Czech Rep.	4.000	4.000	4.000	4.000	4.000	0,0	0,0
Denmark	408			372			
Finland	330	413	413	381	344	-7,7	-9,7
France	12.000						
Germany a)	35.229	35.967	36.845	35.522	32.473	-3,6	-8,6
Hungary	5.490	6.076	5.650	5.230	5.250	-7,4	0,4
Italy	15.100	18.836	18.312	18.815	18.813	2,7	0,0
Norway	452	296	287	287		0,0	
Poland	8.300	8.300	8.300	8.300	7.387	0,0	-11,0
Portugal	2.399	3.400	3.461	3.365	3.293	-2,8	-2,1
Slovenia	2.500	4.195	4.138	4.032	3.669	-2,6	-9,0
Spain	5.027	5.275	5.321	5.242	4.623	-1,5	-11,8
Sweden	3.157			7.000			
Switzerland	1.297	1.274	1.504	1.450	1.450	-3,6	0,0
Turkey	14.000	13.500	13.750	13.750	13.850	0,0	0,7
United Kingdom	14.000	13.000	13.650	13.150	13.000	-3,7	-1,1
Total CAEF	**127.874**	**119.205**	**121.156**	**126.110**	**113.026**	**4,1**	**-4,6**

a) foundries > 50 employees

COPPER ALLOY CASTINGS

Table 25
Total production in t - Copper alloy castings

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria							
Belgium							
Bulgaria		292					
Croatia	221						
Czech Rep. a)	20.000	20.000	20.500	20.000	16.000	-2,4	-20,0
Denmark	779	1.292	1.285	1.188		-7,5	
Finland	2.630	3.247	3.031	3.124	2.415	3,1	-22,7
France	17.724	17.877	19.307	17.409	16.118	-9,8	-7,4
Germany	78.471	79.192	79.278	77.225	46.076	-2,6	-40,3
Hungary	1.681	1.799	705	483	729	-31,5	50,9
Italy	47.941	51.515	50.587	48.232	38.168	-4,7	-20,9
Norway							
Poland a)	6.100	6.100	6.100	6.000	4.800	-1,6	-20,0
Portugal	15.967	16.800	16.496	17.054	16.203	3,4	-5,0
Slovenia	947	842	755	872	990	15,5	13,5
Spain	15.098	15.096	14.400	14.634	15.279	1,6	4,4
Sweden	6.934	8.312	8.792				
Switzerland	2.308	2.021	2.086	2.131	2.023	2,2	-5,1
Turkey	22.500	25.000	30.709	29.285	18.446	-4,6	-37,0
United Kingdom	8.500	8.500	8.670	8.650	8.300	-0,2	-4,0
Total CAEF	**247.801**	**257.885**	**262.701**	**246.287**	**185.547**	**-6,2**	**-24,3**

a) estimated

Table 26
Production value in Mio. € - Copper alloy castings

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria							
Belgium							
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland	27,2	35,4	27,5	29,7	27,0	8,0	-9,1
France							
Germany a)	863,7	871,0	895,2	865,6	777,4	-3,3	-10,2
Hungary							
Italy							
Norway							
Poland							
Portugal	114,7	115,2	105,5	114,6	105,1	8,6	-8,3
Slovenia							
Spain					168,0		
Sweden							
Switzerland							
Turkey	170,0	187,0	246,5	237,1	190,7	-3,8	-19,6
United Kingdom							
Total CAEF							

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					
Czech Rep.	2019										20.000 a)
	2020										16.000 a)
	in %										-20,0
Denmark	2019										1.188
	2020										
	in %										
Finland	2019	3.124,0		622	1.567	935		3.124			3.124
	2020	2.415		358	1.107	950					2.415
	in %	-22,7		-42,4	-29,4	1,6					-22,7
France	2019										17.409
	2020										16.118
	in %										-7,4
Germany	2019	35.916					41.309,0			77.043	77.225
	2020	27.289					18.787,3			46.031	46.076
	in %	-24,0					-54,5			-40,3	-40,3
Hungary	2019										483
	2020										729
	in %										50,9
Italy	2019										48.232
	2020										38.168
	in %										-20,9
Poland	2019										6.000 a)
	2020										4.800 a)
	in %										-20,0
Portugal	2019	17.054		2.000	2.360	12.694		1.900		15.154	17.054
	2020	16.203		1.800	2.360	12.043		1.700		14.503	16.203
	in %	-5,0		-10,0	0,0	-5,1		-10,5		-4,3	-5,0
Slovenia	2019										872
	2020										990
	in %										13,5
Spain	2019										14.634
	2020	15.279,0						11.459,0	306,0	3.514,0	15.279
	in %										4,4
Switzerland	2019	2.131,0									2.131
	2020	2.023,0									2.023
	in %	-5,1									-5,1
Turkey	2019	14.808	4.111	3.524	1.510	5.663	6.042	5.313	3.122	12.415,0	20.850
	2020	13.022	3.825	3.169	1.232	4.796	5.424	4.264	2.141	12.041	18.446
	in %	-12,1	-7,0	-10,1	-18,4	-15,3	-10,2	-19,7	-31,4	-3,0	-11,5
United Kingdom	2019										8.650
	2020										8.300
	in %										-4,0

a) estimated

LIGHT AND ULTRALIGHT CASTINGS

Table 28
Total production in t - Light and ultralight castings

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 /19 in %
Austria	147.096	148.287	150.559	133.406	111.302	-11,4	-16,6
Belgium	783	799	799	683	539	-14,5	-21,1
Bulgaria		5.540					
Croatia	25.174						
Czech Rep. a)	98.000	101.000	102.500	95.000	77.700	-7,3	-18,2
Denmark	3.117	3.014	2.566	2.224		-13,3	
Finland	2.114	2.548	2.395	2.184	1.730	-8,8	-20,8
France	324.102	346.899	394.727	348.062	293.529	-11,8	-15,7
Germany	1.114.105	1.137.096	1.038.211	1.011.599	673.227	-2,6	-33,4
Hungary	118.637	124.229	136.791	122.675	119.186	-10,3	-2,8
Italy	668.471	717.844	724.300	685.584	543.972	-5,3	-20,7
Norway	6.373	5.883	6.525	6.526		0,0	
Poland a)	331.500	330.000	330.000	340.000	272.000	3,0	-20,0
Portugal	32.382	35.000	37.612	37.009	31.966	-1,6	-13,6
Slovenia	47.610	51.209	61.315	54.625	44.618	-10,9	-18,3
Spain	138.591	141.810	127.159	129.345	101.317	1,7	-21,7
Sweden	46.053	46.138	48.000	48.000	39.195	0,0	-18,3
Switzerland	12.902	13.373	13.790	12.699	10.815	-7,9	-14,8
Turkey	370.000	380.000	476.253	504.328	450.264	5,9	-10,7
United Kingdom	126.200	136.200	149.540	149.100	104.522	-0,3	-29,9
Total CAEF	**3.613.210**	**3.726.869**	**3.803.043**	**3.683.049**	**2.875.882**	**-3,2**	**-21,7**

a) estimated

Table 29
Production value in Mio. € - Light and ultralight castings

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria							
Belgium							
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland	25,9	26,3	33,6	21,3	18,2	-36,6	-14,4
France							
Germany a)	4.901,2	5.091,5	5.232,6	4.705,2	3.933,1	-10,1	-16,4
Hungary							
Italy							
Norway	61,0	58,0	51,0	51,0		0,0	
Poland							
Portugal	185,5	192,4	211,0	247,0	200,6	17,1	-18,8
Slovenia							
Spain					571,0		
Sweden							
Switzerland							
Turkey	1.700,0	1.748,0	2.207,4	2.289,4	2.223,8	3,7	-2,9
United Kingdom							
Total CAEF							

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	2019	23.277	106.138	129.415							133.406
	2020	16.493	90.305	106.798							111.302
	in %	-29,1	-14,9	-17,5							-16,6
Belgium	2019										683
	2020										539
	in %										-21,1
Czech Rep.	2019			94.700			300				95.000
	2020			77.400			300				77.700
	in %			-18,3			0,0				-18,2
Denmark	2019										2.224
	2020										
	in %										
Finland	2019	1.584	600	2.184				1.747	437		2.184
	2020	1.211	520	1.730							1.730
	in %	-23,5	-13,3	-20,8							-20,8
France	2019										348.062
	2020										293.529
	in %										-15,7
Germany	2019	374.814	476.190	862.153		22.665	22.665	8.140	783.819	92.859	884.818
	2020	293.971	350.749	652.738		20.489	20.489	7.099	586.180	79.922	673.227
	in %	-21,6	-26,3	-24,3		-9,6	-9,6	-12,8	-25,2	-13,9	-23,9
Hungary	2019			122.425	32	218	250				122.675
	2020	49876,0	69024,0	118.900			286				119.186
	in %			-2,9			14,4				-2,8
Italy	2019			681.447			4.137				817.744
	2020			540.296			3.676				543.972
	in %			-20,7			-11,1				-33,5
Norway	2019	6.526		6.526							6.526
	2020										
	in %										
Poland	2019										340.000
	2020										272.000
	in %										-20,0
Portugal	2019	1.253	35.736	37.009							37.009
	2020	1.293	30.672	31.966							31.966
	in %	3,2	-14,2	-13,6							-13,6
Slovenia	2019			54.625							54.625
	2020			44.618							44.618
	in %			-18,3							-18,3
Spain	2019										129.345
	2020	1317,0	100000,0	101317,0							101.317
	in %										-21,7
Sweden	2019	7.200	40.800	48.000							48.000
	2020										39.195
	in %										-18,3
Switzerland	2019	2.374	10.325	12.699							12.699
	2020	2.542	8.273	10.815							10.815
	in %	7,1	-19,9	-14,8							-14,8
Turkey	2019	252.024	251.454	503.478	450	400	850				504.328
	2020	51.660	397.843	449.503	374	387	761				450.264
	in %	-79,5	58,2	-10,7	-16,9	-3,3	-10,5				-10,7
United Kingdom	2019			146.460			2.600				149.100
	2020			102.522			2.000				104.522
	in %			-30,0			-23,1				-29,9

ZINC

Table 31
Total production in t - Zinc

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria							
Belgium							
Bulgaria		42					
Croatia	25						
Czech Rep. a)	1.000	1.000	1.200	1.000	800	-16,7	-20,0
Denmark							
Finland	86	101	100				
France	20.329	24.719	24.854	24.486	18.880	-1,5	-22,9
Germany	56.247	62.188	59.205	57.182	49.761	-3,4	-13,0
Hungary	2.985	1.717	1.610	763	1.662	-52,6	117,8
Italy	87.764	89.673	91.287	92.161	75.834	1,0	-17,7
Norway							
Poland a)	7.600	7.500	7.500	7.500	6.000	0,0	-20,0
Portugal	2.152	2.250	2.440	2.464	2.165	1,0	-12,1
Slovenia	3.494		8.510	9.665	7.477	13,6	-22,6
Spain	9.079	8.941	9.020	8.426	7.304	-6,6	-13,3
Sweden	8.531	9.274					
Switzerland	989	1.209	1.118	1.051	762	-6,0	-27,5
Turkey	35.000	35.000	40.025	39.432	31.644	-1,5	-19,8
United Kingdom	7.000	7.350	8.085	8.090	7.300	0,1	-9,8
Total CAEF	**242.282**	**250.964**	**254.954**	**252.220**	**209.589**	**-1,1**	**-16,9**

a) estimated

Table 32
Production value in Mio. € - Zinc

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria							
Belgium							
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland	0,8	0,8	1,0				
France							
Germany a)							
Hungary							
Italy							
Norway							
Poland							
Portugal	17,0	18,2	18,4	19,5	19,1	5,8	-2,2
Slovenia							
Spain					56,0		
Sweden							
Switzerland							
Turkey	125,0	125,0	174,8	164,3	115,9	-6,0	-29,4
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
Czech Rep.	2019					1.000 a)
	2020					800 a)
	in %					-20,0
Finland	2019					
	2020					
	in %					
France	2019					24.486
	2020					18.880
	in %					-22,9
Germany	2019		131	1.582	55.469	57.182
	2020		83	1.349	48.330	49.761
	in %		-37,0	-14,7	-12,9	-13,0
Hungary	2019					763
	2020					1.662
	in %					117,8
Italy	2019					92.161
	2020					75.834
	in %					-17,7
Poland	2019					7.500 a)
	2020					6.000 a)
	in %					-20,0
Portugal	2019		2.464			2.464
	2020		2.165			2.165
	in %		-12,1			-12,1
Slovenia	2019					9.665
	2020					7.477
	in %					-22,6
Spain	2019					8.426
	2020		3433,0	3214,0	657,0	7.304
	in %					-13,3
Switzerland	2019					1.051
	2020					762
	in %					-27,5
Turkey	2019		6.078	10.252	23.102	39.432
	2020		4.181	6.028	21.435	31.644
	in %		-31,2	-41,2	-7,2	-19,8
United Kingdom	2019					8.090
	2020					7.300
	in %					-9,8

a) estimated

OTHER ALLOY CASTINGS

Table 34
Total production in t - Other alloy castings

Country	2016	2017	2018	2019	2020	2019 / 18 in %	2020 / 19 in %
Austria							
Belgium							
Bulgaria							
Croatia	15,0						
Czech Rep.							
Denmark	128,0	100,0	89,0	112,0		25,8	
Finland							
France	2.340,0	2.501,0	2.424,0	2.486,0	2.180,3	2,6	-12,3
Germany	0,9	3,7	5,2	5,2	19,0	0,0	265,5
Hungary	123,0		93,0	86,0	99,0	-7,5	15,1
Italy	1.225,0	1311,0	1370,0	1324,0	1.235,0	-3,4	-6,7
Norway							
Poland a)	2.900,0	2.900,0	2.900,0	3.000,0	2.400,0	3,4	-20,0
Portugal							
Slovenia							
Spain	706,0	850,0	2.516,0	1.502,0	683,0	-40,3	-54,5
Sweden							
Switzerland							
Turkey							
United Kingdom							
Total CAEF	**7.437,9**	**7.665,7**	**9.397,2**	**8.515,2**	**6.616,4**	**-9,4**	**-21,3**

a) estimated

WORLD PRODUCTION

Table 35

World production 2019, selected countries - Iron and Steel castings in t

Country		Iron castings	Nodular iron castings	Malleable iron castings	Steel castings	Total
Austria		42.300	104.700	100	11.400	**158.500**
Belarus						**0**
Belgium		55.900	5.100		6.600	**67.600**
Bosnia/Herzegovina	**	17.500	9.100		1.350	**27.950**
Brazil		1.268.060	569.116		259.116	**2.096.292**
Bulgaria	*	30.300	9.200		10.400	**49.900**
Canada	***	330.841			90.091	**420.932**
China		20.400.000	13.950.000	600.000	5.900.000	**40.850.000**
Croatia	**	31.100	11.800		50	**42.950**
Czech. Rep.		166.500	50.000		52.000	**268.500**
Denmark		28.900	58.100			**87.000**
Finland		18.200	29.300		10.400	**57.900**
France		537.200	711.400		55.700	**1.304.300**
Germany		2.192.800	1.433.700		178.500	**3.805.000**
Hungary		18.400	55.600		2.200	**76.200**
India		7.718.794	1.217.247	50.000	1.141.117	**10.127.158**
Italy		667.800	381.300		59.900	**1.109.000**
Japan		2.183.800	1.362.600	37.900	153.000	**3.737.300**
Korea (Republic of)		890.300	679.000	500	150.400	**1.720.200**
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		450.000	155.000		50.000	**655.000**
Portugal		41.100	94.400		4.500	**140.000**
Romania		15.000	1.500	3.500	3.000	**23.000**
Russia		2.184.000			1.134.000	**3.318.000**
Serbia		26.300	3.100		18.150	**47.550**
Slovenia		130.500	46.700			**177.200**
South Africa	*					**0**
Spain		362.600	663.000	16.300	71.400	**1.113.300**
Sweden		154.900	62.000		23.500	**240.400**
Switzerland		9.300	14.700		2.300	**26.300**
Taiwan		641.178	215.796		68.577	**925.551**
Turkey		614.300	934.400		192.500	**1.741.200**
Ukraine	***	400.000	120.000	30.000	580.000	**1.130.000**
United Kingdom		144.500	220.500		49.200	**414.200**
United States		8.812.654				**8.812.654**

Source: Modern Casting, data can differ from CAEF data

* 2017 Results

** 2016 Results

*** 2015 Results

Table 36

World Production 2019 selected countries - Non-ferrous metal castings in t

Country		Copper	Aluminum	Magnesium	Zinc	Others	Total
Austria			129.415	3.991			**133.406**
Belgium							**0**
Bosnia/Herzegovina	**		10.500				**10.500**
Brazil		20.993	164.718	5.040	1.175		**191.926**
Bulgaria	*	292	5.540		42		**5.874**
Canada	***	14.237	211.374				**225.611**
China		800.000	6.850.000			250.000	**7.900.000**
Croatia	**	221	25.174		25	15	**25.435**
Czech. Rep.		20.000	94.700	300	1.000		**116.000**
Denmark		1.188				112	**1.300**
Finland		3.124	2.184				**5.308**
France		17.409	348.062		24.486	2.486	**392.443**
Germany		77.225	996.127	15.472	57.182	5	**1.146.011**
Hungary		483	122.425	250	763	86	**124.007**
India			1.364.652				**1.364.652**
Italy		66.438	810.647	7.097	74.036	481	**958.699**
Japan		70.900	437.500			1.030.000	**1.538.400**
Korea (Republic of)		24.500	623.500	12.000			**660.000**
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		6.000	340.000		2.464	3.000	**351.464**
Portugal		17.054	37.009			194.463	**248.526**
Romania		60.000	2.000	250	90	85.340	**147.680**
Russia		117.600	588.000	75.600		100.800	**882.000**
Serbia		3.100	10.120		30		**13.251**
Slovenia		872	54.625	10.537	9.665		**75.699**
South Africa	*				792		**792**
Spain		14.634	129.345		8.426	1.502	**153.907**
Sweden			48.000				**48.000**
Switzerland		2.131	12.699		1.051		**15.881**
Taiwan		31.202	421.283				**452.485**
Turkey		29.285	503.478	850	39.432		**573.045**
Ukraine	***	60.000	280.000	15.000	25.000	50.000	**430.000**
United Kingdom		8.650	146.460	2.600	8.090		**165.800**
United States		319.130	1.795.190		330.258	48.070	**2.492.648**

Source: Modern Casting, data can differ from CAEF data

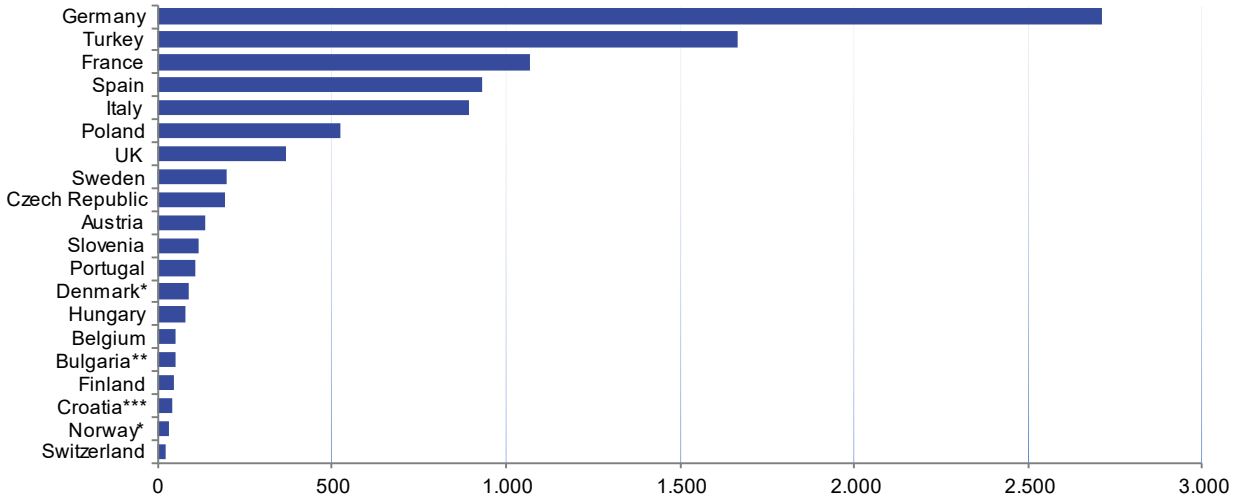
* 2017 Results

** 2016 Results

*** 2015 Results

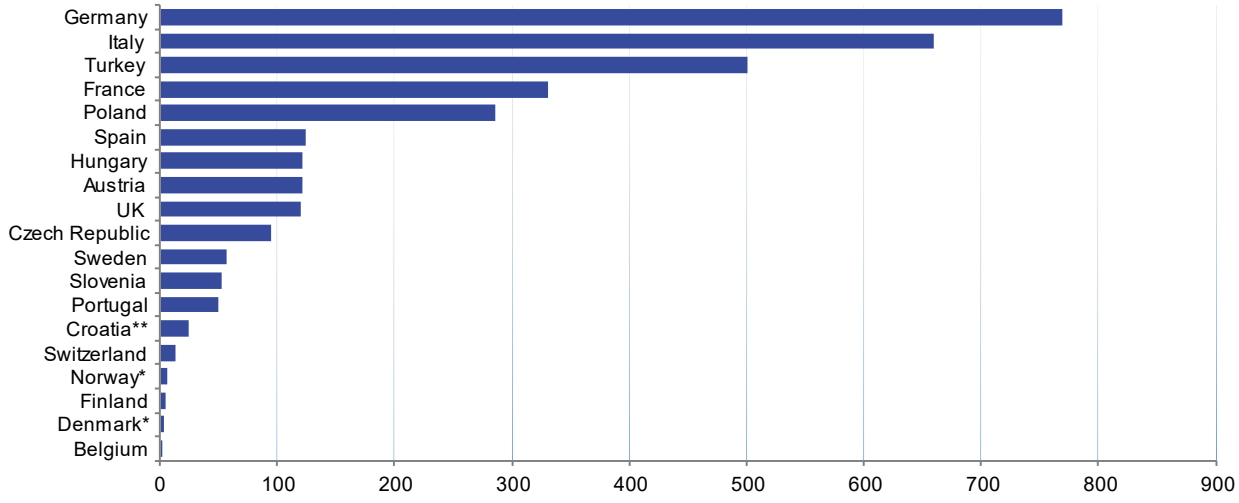
GRAPHS

Production of Iron, Ductile Iron and Steel Castings in the European Foundry Industry 2020 (in 1.000 t)



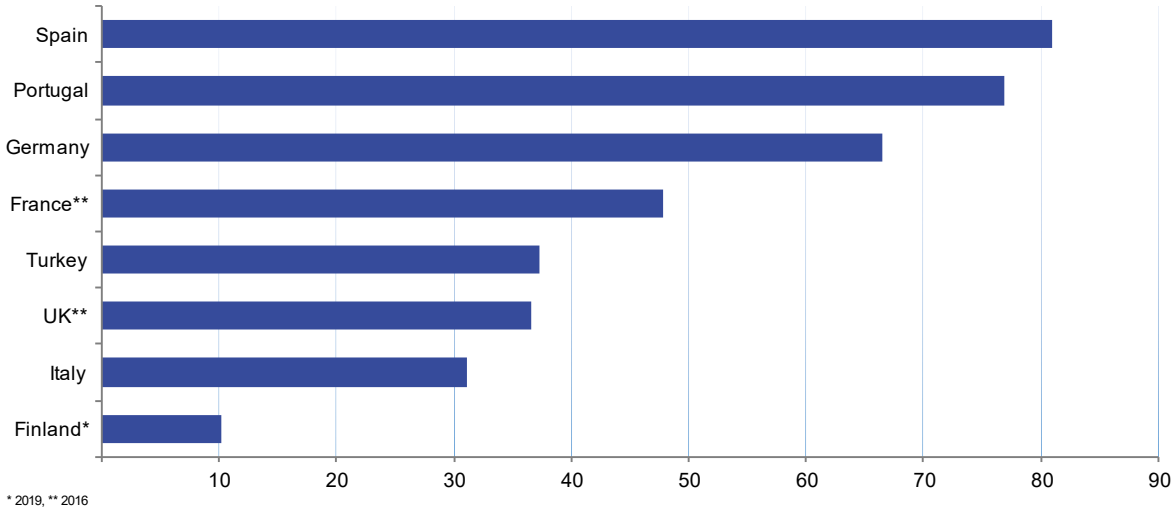
*2019, ** 2017, *** 2016

Production of Non-Ferrous Metal Castings in the European Foundry Industry 2020 (in 1.000 t)



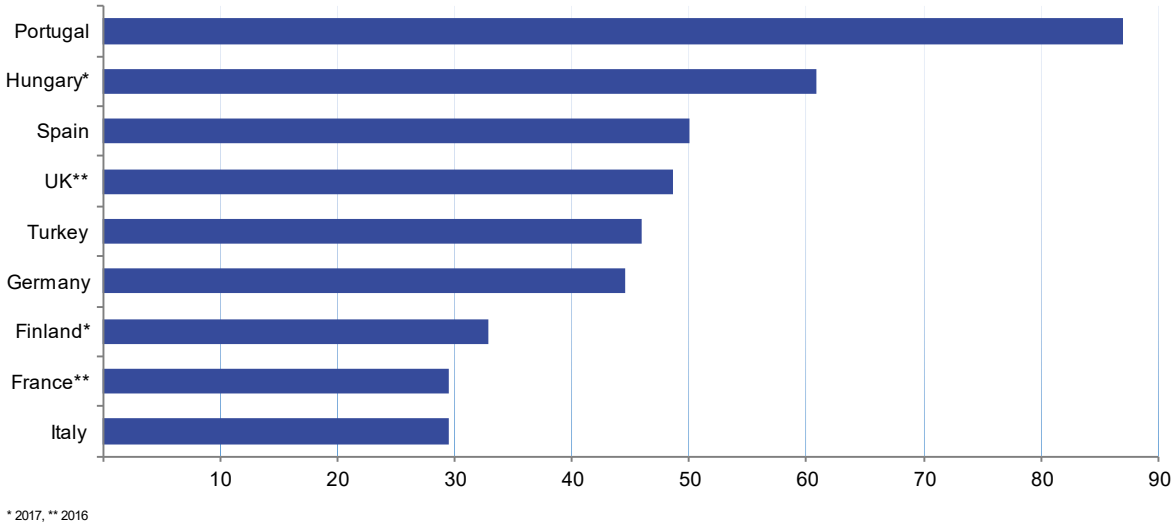
* 2019, ** 2016

Iron Castings for the Vehicle Industry
National Production Share 2020 (in %)



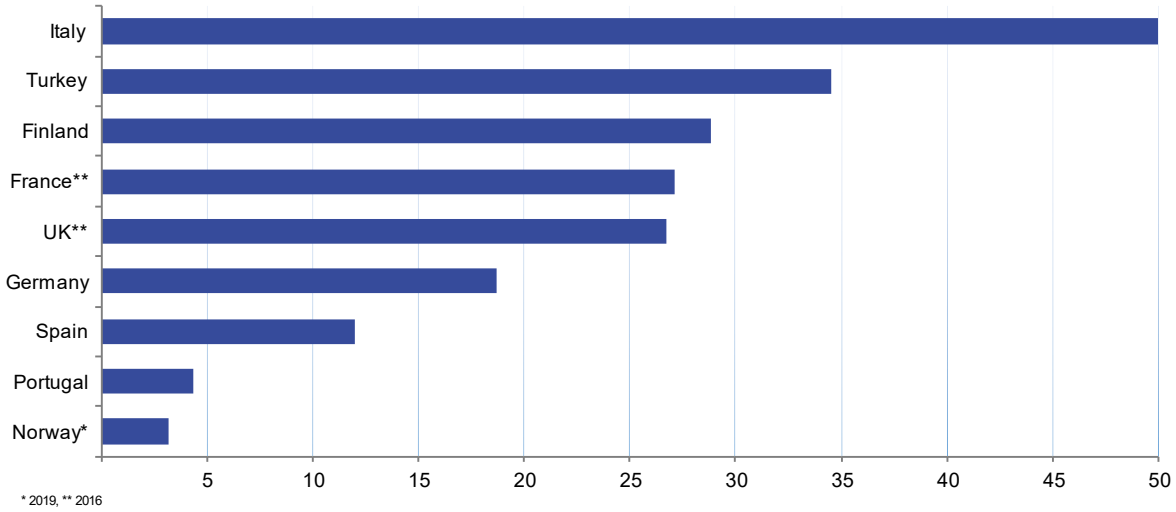
* 2019, ** 2016

Ductile Iron Castings for the Vehicle Industry
National Production Share 2020 (in %)



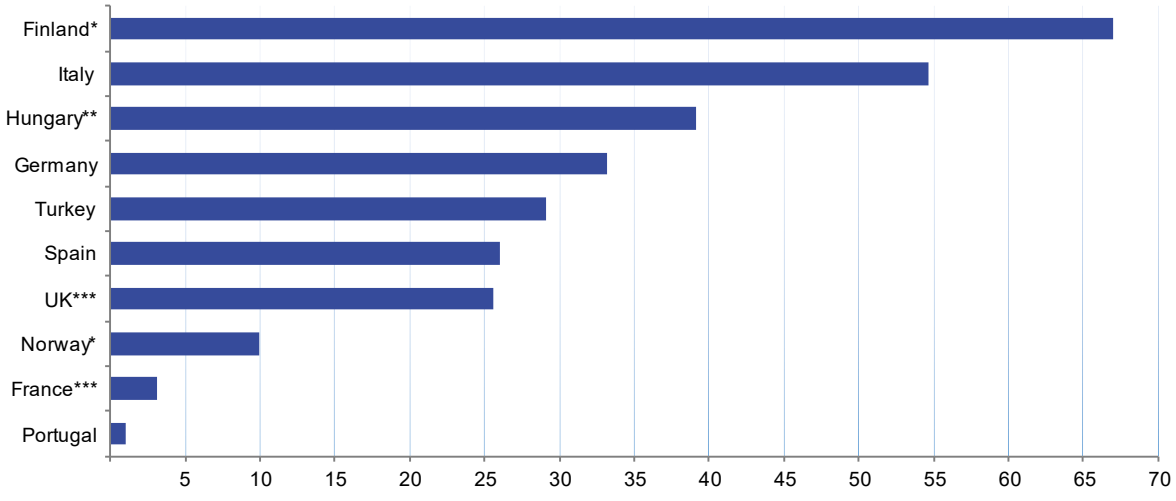
* 2017, ** 2016

Iron Castings for Engineering Plant and Machinery
National Production Share 2020 (in %)



* 2019, ** 2016

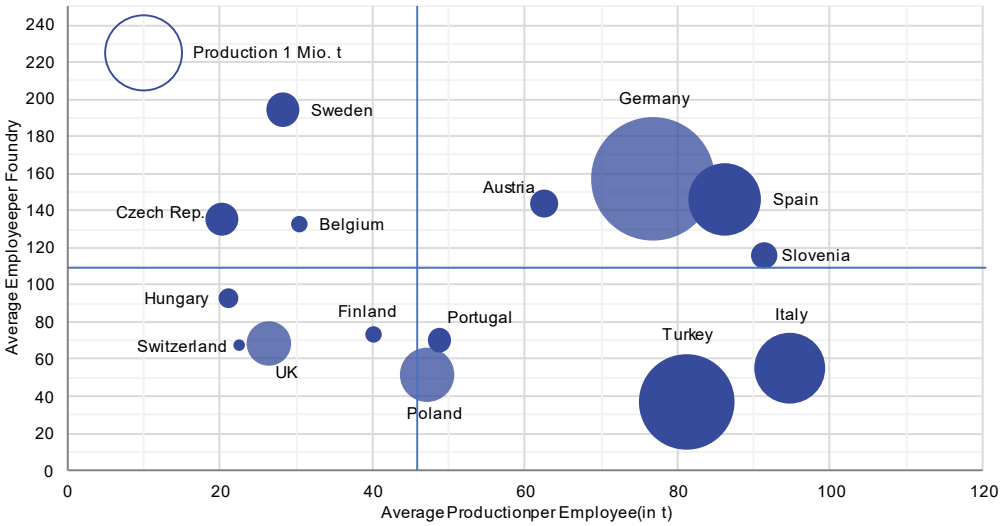
Ductile Iron Castings for Engineering Plant and Machinery
National Production Share 2020 (in %)



* 2019, ** 2017, *** 2016

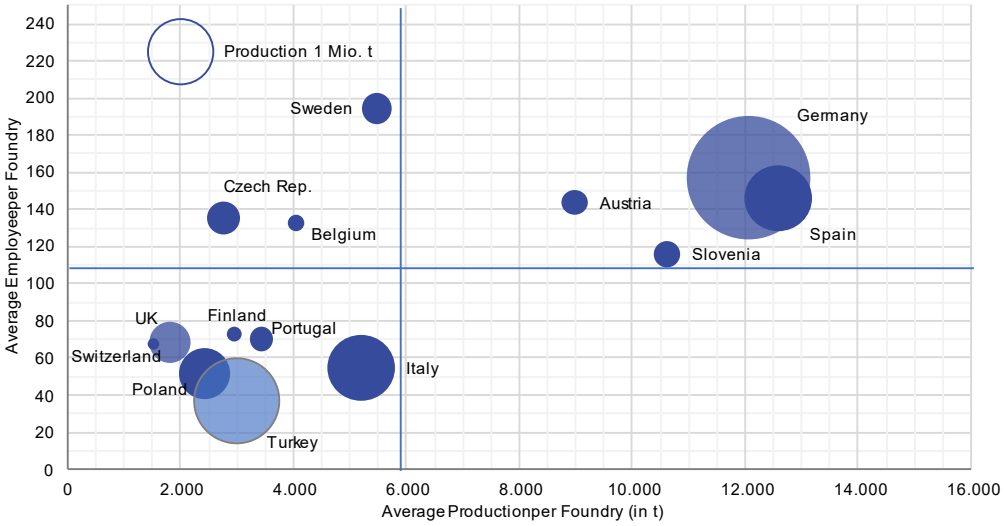
Average Production per Employee – Iron, Steel and Malleable Iron Castings

Production of Iron, Ductile Iron and Steel Castings in the European Foundry Industry 2020 (in t)

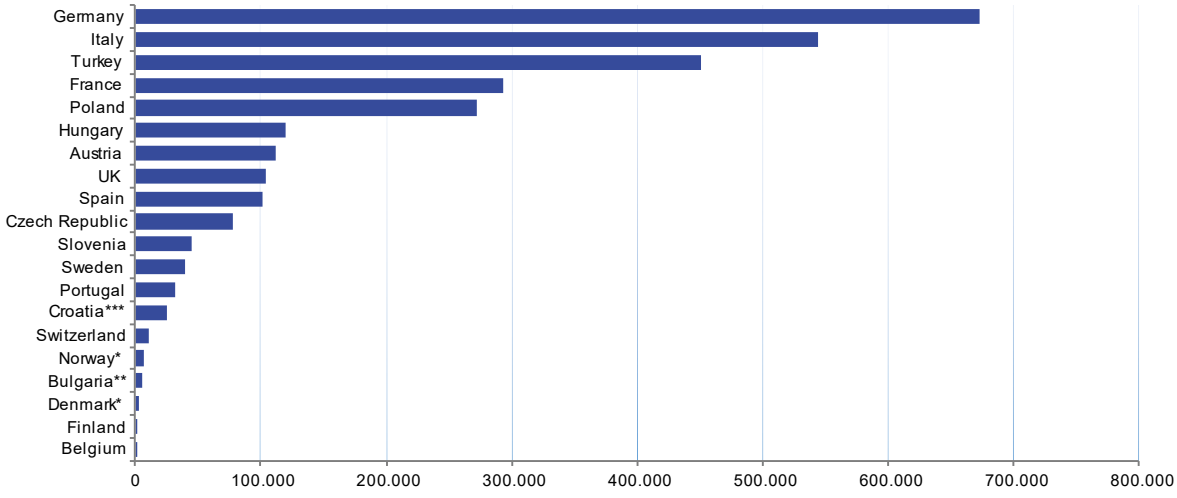


Average Production per Foundry – Iron, Steel and Malleable Iron Castings

Production of Iron, Ductile Iron and Steel Castings in the European Foundry Industry 2020 (in t)

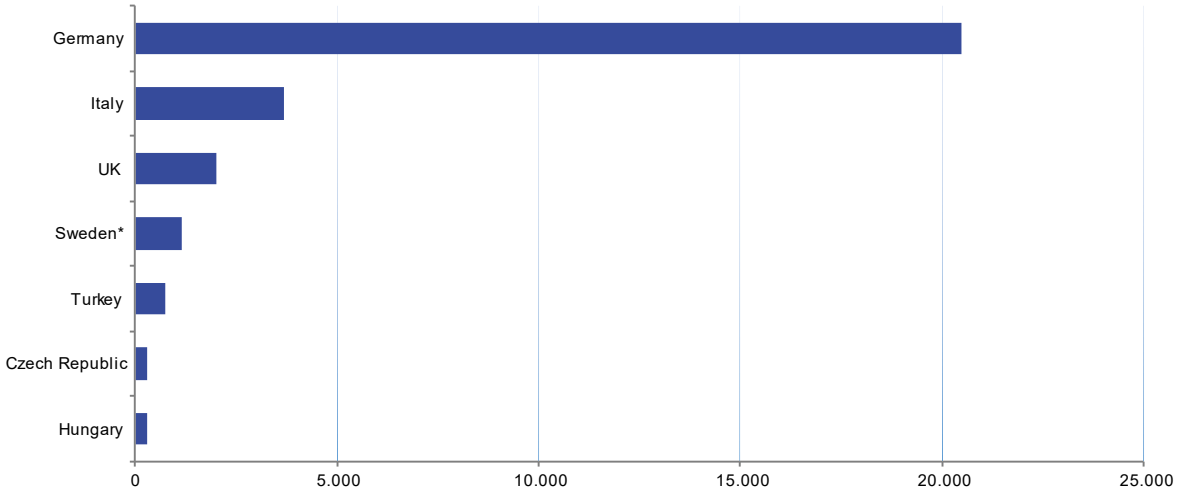


Production of Light and Ultralight Castings in the European Foundry Industry 2020 (in t)



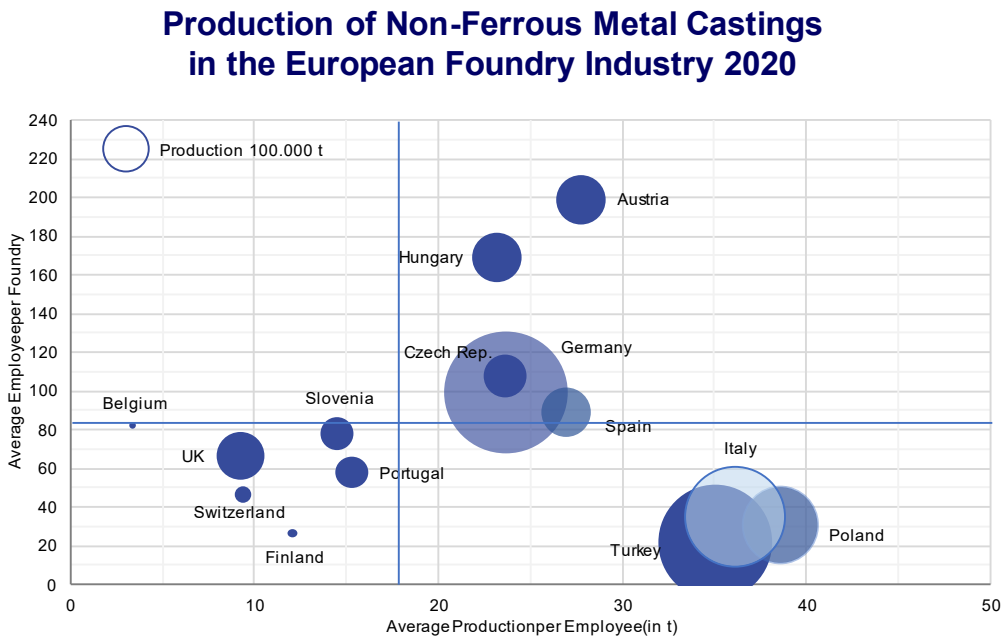
* 2019, ** 2017, *** 2016

Major Producers of Magnesium Castings in the European Foundry Industry 2020 (in t)

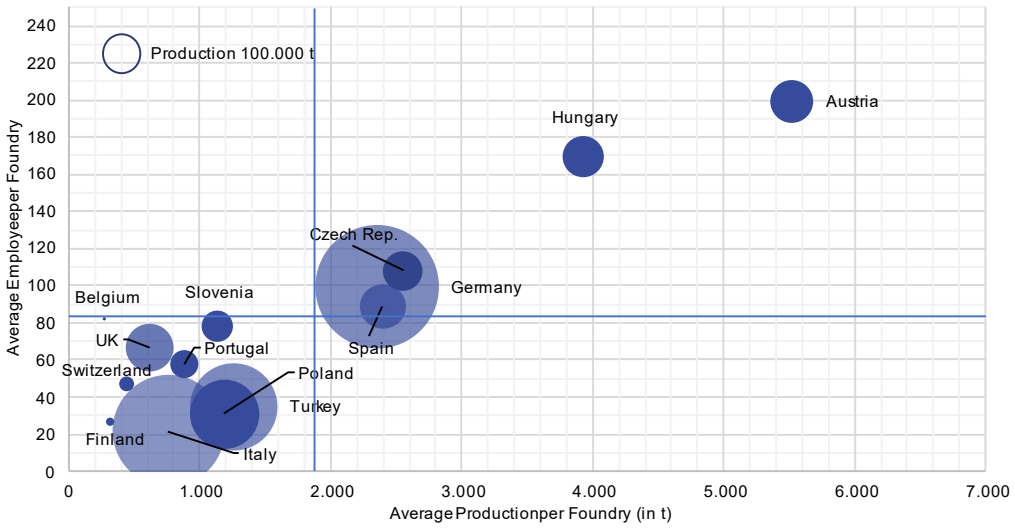


* 2017

Average Production per Employee – Non-Ferrous Metal Castings



Average Production per Foundry – Non-Ferrous Metal Castings



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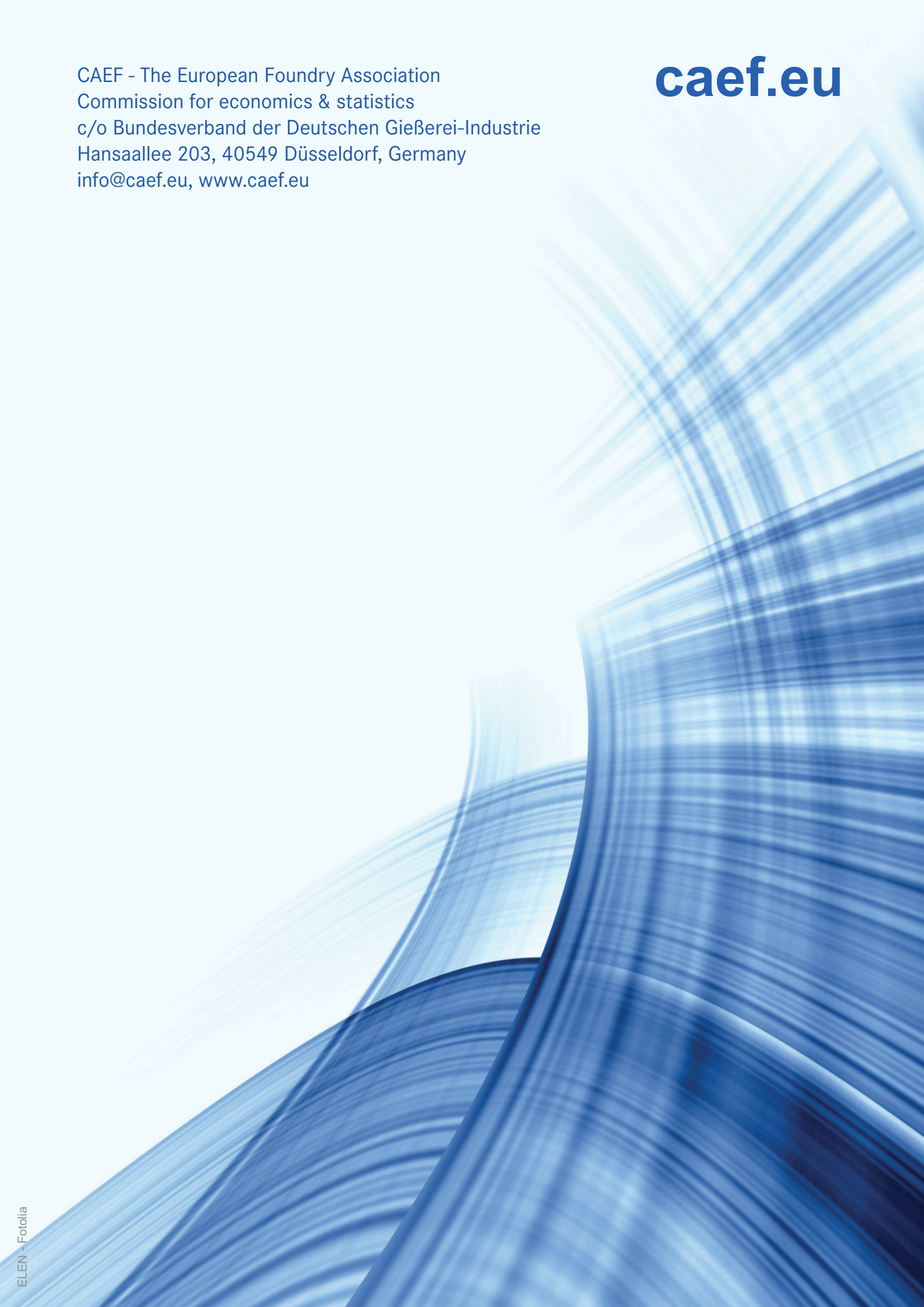

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