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The European
Foundry Association

2018

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Preface

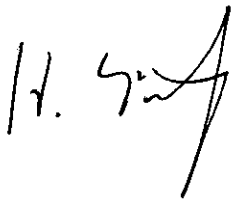
Once again, the CAEF - The European Foundry Association - Commission for economics & statistics has compiled a statistical annual entitled "The European Foundry Industry 2018" from national reports and statistical material gathered from its member countries. The main tables were supplemented by information 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 wishes to express its gratitude to all those CAEF member association representatives who helped in preparing these reports and figures.

Düsseldorf, August 2019

CAEF - The European Foundry Association



H. Lickfett
Secretary General



S. Steffen
Commission for economics & statistics, Secretary

TOTAL SURVEY

The European Foundry Industry in 2018

The Economy and the Casting Customer Industries

The Macro-economic Situation at the end of the year 2018

The economy in the euro area continued to grow moderately during the year 2018. E.g. real GDP increased by +1.1% in Q4 2018. All in all, GDP in the euro area increased by 1.8%. The euro area slowed more than expected as a combination of factors, including weakening consumer and business sentiment; delays associated with the introduction of new fuel emission standards for diesel-powered vehicles in Germany and fiscal policy uncertainty. Growing concerns about a no-deal Brexit also likely weighed on investment spending within the euro area. Private consumption grew at a higher pace compared to 2018. The euro area annual inflation rate was 1.6% in December 2018, down from 1.9% in November. A year earlier, the rate was 1.4%. In December 2018, the highest contribution to the annual euro area inflation rate came from services, followed by energy, food, alcohol and tobacco and non-energy industrial goods. The unemployment rate at the euro area level declined from 9.1% in 2017 to 7.8% in December 2018.

Forecast 2019/2020

		Gross Domestic Product (2)		Consumer Prices (2)		Unemployment Rate (2)	
		Growth Rate in%		Growth Rate in%		In%	
Country	Weighting (1)	2019	2020	2019	2020	2019	2020
Austria	2,3	2,0	1,7	1,8	2,0	5,1	5,0
Belgium	2,6	1,3	1,4	1,9	1,6	5,9	5,9
Bulgaria	0,3	3,3	3,0	2,4	2,3	5,0	5,0
Croatia	0,3	2,6	2,5	1,5	1,6	9,0	8,0
Czech Republic	1,2	2,9	2,7	2,3	2,0	3,1	3,2
Denmark	1,7	1,7	1,8	1,1	1,3	4,9	4,9
Finland	1,4	1,9	1,7	1,3	1,5	7,2	7,1
France	13,7	1,3	1,4	1,3	1,5	8,8	8,4
Germany	19,7	0,8	1,4	1,3	1,7	3,4	3,3
Hungary	0,8	3,6	2,7	3,2	3,1	3,5	3,4
Italy	10,2	0,1	0,9	0,8	1,2	10,7	10,5
Lithuania	0,3	3,2	3,0	2,3	2,3	6,3	6,2
The Netherlands	8,0	1,8	1,7	2,3	1,6	3,7	3,6
Norway	2,1	2,0	1,9	1,9	1,7	3,7	3,7
Poland	2,9	3,8	3,1	2,0	1,9	3,6	3,5
Portugal	1,2	1,7	1,5	1,0	1,7	6,8	6,3
Slovenia	0,3	3,4	2,8	1,4	1,6	4,8	4,9
Spain	7,0	2,1	1,9	1,2	1,6	14,2	14,1
Sweden	2,7	1,2	1,8	1,9	1,7	6,3	6,3
Switzerland	3,5	1,1	1,5	0,8	0,9	2,8	2,8
Turkey	3,8	-2,5	2,5	17,5	14,1	12,7	11,4
United Kingdom	14,0	1,2	1,4	1,8	2,0	4,2	4,4
CAEF	100,0	1,2	1,6	2,1	2,1	6,5	6,3

(1) Source: Worldbank GDP 2018, (2) Source: IMF World Economic Outlook April 2019

The Economic Situation in the Major Casting Customer Industries

The chief client sectors of the foundry industry

Vehicle construction

The automotive markets developed differently around the world in 2018. The European passenger car market (EU28+EFTA) maintained the high level from 2017, while the US actually recorded a slender increase. The markets in Brazil and Russia demonstrated strong growth. India also expanded. China recorded its first market contraction, although the volume remains very large.

In Europe, a total of 15.6 million passenger cars were newly registered in 2018, equaling the number in the previous year. In December car sales in Europe just exceeded 1.0 million units, which was a loss of 9%. In many countries December had fewer working days than it had in 2017. There were increases in the year's accumulated figures on the large volume markets in France (+3%) and Spain (+7%), while Germany matched its 2017 level. Results were down in Italy (-3%) and the United Kingdom (-7%).

The US market for light vehicles finished last year on 17.2 million units sold, which was 78.800 more than in 2017 ($\pm 0\%$). Here the sales of passenger cars contracted by 13% while the light truck segment added 8%. In December 1.6 million light vehicles were sold (+1%).

In China the passenger car market lost almost 4% of its volume in 2018, falling to 23.3 million new vehicles. This was the first decrease for decades. The main factor behind the slump was the trade conflict with the US. In December the sales volume came to 2.4 million units, i.e. around 16% below the previous year's level.

In India the total sales volume for 2018 increased by 5%. In all, 3.4 million units were sold. In December 2018 the market matched the figure from December 2017 (238.700 units). In Japan, business in new vehicles showed solid development in 2018. The 4.4 million passenger cars sold equaled the previous year's result. December sales came to 319.700 newly registered passenger cars – a 3% fall. The market in Russia continued to recover last year and totaled 1.8 million new vehicles, which was 13% up on the volume in 2017. Sales of light vehicles in December expanded by 6% to 175.200. The Brazilian market for light vehicles recorded keen growth for 2018 as a whole. Sales of new vehicles rose by 14% to nearly 2.5 million. In December the increase amounted to 10% (225.400 vehicles) and resulted in the twentieth month of growth in succession.

Mechanical engineering

According to estimates by VDMA economists, in 2018, the world machinery turnover rose by 4% in nominal terms to 2.6 trillion euros in an environment characterised by unfavourable trade policy conditions and domestic crises. With a turnover volume of 856 billion euros in 2018, China continued to occupy the top position in the country ranking which it has held since 2009. At almost 7%, the increase in turnover was slightly higher than in the previous year. There were no changes in the following positions neither: The USA followed on rank 2. Here, turnover was increased by 2% to 334 billion euros. Germany confirmed its position as the third-largest machinery producer with nominal turnover of 297 billion euros, an increase of almost 4% on the previous year. The TOP-5 countries account for 72% of global machinery turnover, the ten largest even for 83%.

The mechanical engineering production in Germany increased by 2% in 2018. This missed the VDMA forecast – a plus of 5%. Incoming orders in the mechanical engineering sector had originally signaled a much more dynamic growth in production. In 2018 as a whole, machine builders recorded a 6% increase in domestic orders, while orders from abroad rose by 4%. However, capacity bottlenecks led to weaker than expected production.

Global machine turnover could increase by 2% in price-adjusted terms in 2019. But the experts from the German Mechanical Engineering Industry Association (VDMA) are not expecting that the 2019 figures exceed those of the previous year and have reduced their forecast for real machine production for the second time within just a few months to minus 2%.

Building industry

In 2018 total construction output in the Euroconstruct area grew by 3.1%. But, the outlook for the forecast period up to 2021 shows a slower development, in a context of a weakening economic expansion. New construction continues to be the leading force of the expansionary cycle (+4.3% in 2018, resulting in an overall cumulated increase by 17.5% compared to 2014), with new civil engineering approaching a 6% annual growth. New residential construction is estimated to pass a 5% increase in 2018 compared to the previous year.

2017 was the year with the best construction development in the EC-19 region during this recent economic recovery. At that time the strongest annual increase for more than 20 years (+4.2%) could be observed. In 2018 the first signals of a new slowdown appeared in some regions (like in UK and several Nordic countries) where production growth in some areas stopped.

Nevertheless, total construction output in 2018 increased and summed up to a total volume of 1.610 billion Euro in the Euroconstruct region. After five years of continuous growth it is still far below peak level, with significant different regional dynamics. Seven countries already exceeded pre-crisis levels, six others had in 2018 the same market capacity as in 2007, while there remaining six, including three of the five major countries, still have a negative gap of more than 10% that has to be filled.

The new short term outlook defines a slowing and more moderate growth path: European construction output is forecasted to increase by less than 2% in 2019, and by less than 1.5 percentage points within the next two-year period. Some of the downward risks already materialised since the autumn conference, adding elements of concerns and uncertainty to an overall scenario characterised by structural factors, like demographic pressure, market saturation, a slow realisation process among other bottlenecks.

The leading market in the next three year period will be infrastructure. It is expected to sustain the European construction market with an average annual growth of more than 3%, compared to weaker performing building sector (+1%). At country level, the positive development will be sustained by strong growth of about 6% in Eastern European countries, except in Slovakia. A similar strong increase is forecasted for Ireland, even if the trend is decelerating within the forecast period. A more moderate progress is forecasted in countries like Netherlands, Portugal and Spain with growth rates close to 4%. The latter is the best performing one among the big five countries. Germany and France face in opposite to that a stagnating construction market, while in UK and Italy an increase in output by less than 2% on average is likely.

Steel industry

Global crude steel production reached 1,808.6 million tonnes (Mt) for the year 2018, up by 4.6% compared to 2017. Crude steel production increased in all regions in 2018 except in the EU, which saw a 0.3% contraction.

Asia produced 1,271.1 Mt of crude steel in 2018, an increase of 5.6% compared to 2017. China's crude steel production in 2018 reached 928.3 Mt, up by 6.6% on 2017. China's share of global crude steel production increased from 50.3% in 2017 to 51.3% in 2018. India's crude steel production for 2018 was 106.5 Mt, up by 4.9% on 2017, meaning India has replaced Japan as the world's second largest steel producing country. Japan produced 104.3 Mt in 2018, down 0.3% compared to 2017. South Korea produced 72.5 Mt of crude steel in 2018, an increase of 2.0% compared to 2017.

The EU produced 168.1 Mt of crude steel in 2018, a decrease of 0.3% compared to 2017. Germany produced 42.4 Mt of crude steel in 2018, a decrease of 2.0% on 2017. Italy produced 24.5 Mt in 2018, up by 1.7% on 2017. France produced 15.4 Mt of crude steel, a decrease of 0.7% on 2017. Spain produced 14.3 Mt of crude steel in 2018, a decrease of 0.1% on 2017.

Crude steel production in North America was 120.5 Mt in 2018, 4.1% higher than in 2017. The US produced 86.7 Mt of crude steel, up by 6.2% on 2017.

The CIS produced 101.3 Mt, an increase of 0.3%. Russia produced 71.7 Mt of crude steel in 2018, up by 0.3% on 2017. Ukraine produced 21.1 Mt of crude steel in 2018, a decrease of -1.1% compared to 2017.

Annual crude steel production for South America was 44.3 Mt in 2018, an increase of 1.3% on 2017. Brazil produced 34.7 Mt in 2018, up by 1.1% compared to 2017.

The Middle East produced 38.5 Mt of crude steel in 2018, an increase of 11.7% on 2017. Iran* produced 25.0 Mt in 2018, up 17.7% on 2017.

Turkey's crude steel production for 2018 was 37.3 Mt, down by 0.6% on 2017.

The Foundry Industry

In 2018, the iron and steel foundries of the CAEF member states produced 12.3 million (m.) tons of castings. Compared to the year before, this corresponds to a 1.3% increase in production weight. (For Bulgaria and Croatia a positive growth rate of 1.3% compared to the average plus was calculated because of partly missing data.) The six countries that dominate the industry in terms of weight, namely Germany, Turkey, France, Italy, Spain and Poland, account for 84.6% of the production of ferrous metal castings, the same share as in 2017. The production was up in most countries. The exceptions are Finland, Slovenia and Turkey.

In 2018, non-ferrous metal foundries in the CAEF member states booked a production increase of 5.1% to roundabout 4.5 m. tons. (For Belgium and Croatia a production growth of 5.0% compared to the average plus was calculated because of partly missing data.) In the countries that dominate the production of non-ferrous metal castings, namely Germany and Italy, the output was down for Germany by 2.4% and slightly up by 0.8% for Italy. Together, these two countries account for 48.3% of the total volume of non-ferrous metal castings produced in the CAEF member states. In the reporting year of 2018 all countries with the exception of Denmark, Finland, Germany and Spain booked positive growth rates.

The number of employees in iron and steel foundries increased in Finland, Germany, Italy and the United Kingdom. In the Czech Republic and Poland the employment was stable. All other countries logged in a decreasing number of employees.

In 2018 the non-ferrous metal sector was again dominated by positive employment trends. A negative development was logged in for Hungary, Italy, Norway and Slovenia.

In Slovenia, Switzerland and Turkey new foundries have started their business. In Austria, Hungary, Italy, Norway, Spain and the United Kingdom foundries were closed.

The share of cast iron with lamellar graphite in the output total of iron and steel castings was 50%, a smaller share than in the three years before. Correspondingly, the share of ductile cast iron was slightly higher (43.7%). The steel sector logged a share of 6.4%.

The production of castings made of non-ferrous metal alloys is still dominated by light metals. The share was unbroken 87.7%. Furthermore, the share of copper alloys holds the level of round about 6.2%. Therefore, not surprisingly, the share of components made of zinc alloys was nearly stable (5.2%).

From the data available it appears that the export quota of the iron and steel foundries decreased from 45.5% last year to 40% in 2018. Calculation base is the foreign trade report of ten member countries. Germany is still the country that dominates the export trade in castings with a volume of almost 1.7 m. tons (plus 2.4%). The second place in volume, the ninth year in a row, was logged for Turkey: Turkey reported an export volume of more than 1.0 m. tons (plus 6.5%). Spain logged in a volume of 0.75 m. tons (plus 6.1%) and is placed the third place the fourth year in a row. The fourth place is booked for Italy (520.900 tons, plus 10%). France has to deal for another year with a decrease of 4% (433.200 tons).

If we consider only those CAEF member states with current figures for the previous year, the value of the iron and steel castings produced increased by 1.1%, in doing so the weight of castings was up by 1.2%.

From the data that was available for a year-on-year comparison, it appears that in the non-ferrous metal sector the value of production was stable whereas the weight of castings produced was 5% higher.

For all countries with missing data the data gap were filled with the average growth rates of the available data to get approximations.

The Situation in the Casting Material Sectors

Iron

At 6.1 m. tons, the output of the CAEF member states was down by 1.1%. Missing data for Bulgaria and Croatia were calculated with the average growth rate of available data from the other nations. A negative growth rate was logged for Bulgaria, Finland, Hungary, Slovenia and Turkey. The production was stable in Austria, Czech Republic and Poland. All other countries can deal with a growing production for the year 2018. 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 (83.4%), Germany (68%) and Turkey (38.6%) respectively. For the mechanical engineering industry the highest shares in the output were posted for 2018 by Italy (46.8%), Finland (25.3%) and Turkey (34.8%).

The number of persons employed in iron foundries (incl. ductile cast iron) was up in Finland, Germany, Italy and Portugal. In Spain and Turkey the employment decreased.

Ductile Cast Iron

The producers of ductile cast iron reported an increase of output by 3.9% to 5.3 m tons. Missing data for Bulgaria and Croatia were calculated with the average growth rate of available data from the other nations.

Belgium, France, Portugal and Switzerland logged a downturn in production. In Finland and Poland the production level was stable. All other countries reported an increasing production.

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, France, Turkey, 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 90.6%, Turkey at 45.1% and Germany at 40.4%. The mechanical engineering industry holds the highest shares in output in Finland (56.4%), Italy at 53.5% and Germany at 32.9%. Unfortunately, it is impossible to present the share of the building industry.

Steel

In the year 2018 the output of steel castings increased by 2.1% to 797.000 tons. Missing data for Bulgaria and Croatia were calculated with the average growth rate of available data from the other nations. Turkey, now the leading producer, logged a production volume 13.2% higher than the year before. For Germany, second in line, the production was up by 5.1%. For the Czech Republic, Hungary, Portugal and Slovenia a decreased production was reported. Production in Poland and France remained stable. All other nations increased their steel production.

In those member countries for which data for a year-on-year comparison was available, the value of the output of steel casting components increased by 4.8%.

The number of persons employed in steel foundries was stable only in Poland, Spain and Turkey. In all other countries the employment decreased.

Non-ferrous metal castings

The output of non-ferrous metal casting components in the CAEF member countries was up by 5.1% to 4.5 m. tons. Missing data for Croatia was calculated with the average growth rate of available data from the other nations. As before, the non-ferrous metal sector is dominated by Germany, Italy, Turkey, France and Poland. The share of the first three countries slightly decreased from 62.0% to 60.41% in 2018. In Denmark, Finland, Germany and Spain a decreasing production volume was logged. Poland reported a stable production volume. All other countries had registered positive growth rates.

Traditionally, the production of non-ferrous metal castings is dominated by light metals. The motor vehicle industry is the foremost customer. In the year 2018 the output of light metal castings (aluminium and magnesium) increased by 2.1% compared to 2017, reaching nearly 4 m. tons. Missing data for Bulgaria and Croatia were calculated with the average growth rate of available data from the other nations. Together, Germany and Italy, the two major producers, account for 47.8% of the light-metal castings. The production for these leading countries went down by 8.7% for Germany and increased slightly by 0.8% for Italy. Denmark, Finland and Spain reported a negative development. Belgium and Poland logged an unchanged production volume. Among the light metal alloys, magnesium plays a subordinate role in terms of output weight. Germany is the major producer with 18.200 tons followed by Italy (8.000 tons) and the United Kingdom (2.600 tons). Austria (no data available) and Sweden are additional important players.

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 2018 the level was up by 1.7%. The reported volume in 2018 reached a level of more than 281.000 tons. Because of the missing data of some countries it is difficult to estimate the real market volume. For the Czech Republic, France, Sweden, Switzerland, Turkey and the United Kingdom a positive growth rate for production was logged. Denmark, Germany and Poland reported a stable production volume. All other countries achieved a production decrease.

The output of zinc castings was up by 4.1% with a volume of more than 246.600 tons. Missing data for Bulgaria, Croatia and Sweden were calculated with the average growth rate of available data from the other nations. Italy, Germany and Turkey are the major producers, together holding a share of 69.9% in output total. A stable production was logged for France and Poland. Negative growth rates were reported for Finland, Germany, Hungary and Switzerland. All other countries achieved a growing production volume in 2018.

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:

IFW Kiel, ifo Munich, Worldbank, IMF, ACEA, VDA, VDMA, gtai, Euroconstruct, Worldsteel, CAEF

REPORTS OF THE COUNTRIES

General economic situation

Review 2018 – Outlook 2019

2018 was a year marked by political and economic uncertainties. The general framework conditions for 2019 become increasingly unstable. There are several unfavourable factors for the companies in 2019: costs increase while growth is weak. Business is slowing down, forecasts are increasingly negative. In Austria, too, only a modest GDP-growth is anticipated. There is a widespread uncertainty as to the exit of the ECB from its expansionary monetary policy. Business activities in the eurozone and the USA should be stimulated by abstaining from an increase of the interest rate. Austria expects an inflation of 2.0%.

After a vigorous upswing, the Austrian production cycle passed its peak at mid-2018; industrial activity is declining now. Many companies already scaled back their investments in 2018, they did not increase their stocks and there were less imports. However, the situation should stabilize in the 2nd half-year of 2019, as the economic downturn will be partly compensated and the economic policy is introducing anticyclical measures on a global level.

The weak international trade and the reduction of the industrial production in Germany slow down currently the trend of exports and the production of Austrian goods. Still, the decrease in global trade has only a limited impact as it is due, to a significant extent, to the special effects of the trade dispute between China and the USA. Production losses in the German automotive sector, due to the backlog of certifications in autumn of 2018, affected domestic suppliers. Despite the weakening of the Austrian foreign trade, it will provide growth impulses over the year of 2019. The excellent demand for investments in the USA and the dynamic development in central Europe keep assuring a solid order situation.

Private consumption becomes a main pillar of the Austrian economy. The wage agreements, which were slightly above average in 2019, and a rather expansive fiscal policy (family bonus) increase the income of private households. Therefore the service sectors generate an impressive added value. Due to their high labour intensity, employment in the forecast period continues to show a positive trend and is only somewhat restrained by the declining industrial activity. The unemployment rate is still going down in 2019. In 2020, the rather high labour demand required for reducing unemployment will not be obtained any more. Because of a permanent expansion of employment, tax revenues are flowing in. Public spending shows only a moderate increase due to favourable developments in important areas (mainly interest expenditure, but also pension payments) and a budget surplus will be achieved.

Forecast for Austria Change compared to previous year in %	2018	2019	2020
GDP growth, real terms	+2.7	+1.7	+1.8
Consumer spending, real terms	+1.6	+1.7	+1.7
Gross capital formation, real terms	+3.3	+2.3	+1.8
Exports of goods and services, real terms	+4.4	+3.1	+3.6
Actively employed persons	+2.5	+1.6	+1.1
Unemployment, in % of actively employed persons	7.7	7.3	7.3

Source: WIFO 2019

Situation of the foundry industry

According to our own survey, production, sales and employment increased in 2018. Total production amounted to about 327.574 tons in 2018, i.e. an increase of 2,9% over 2017. Total sales of the branch increased by 4.2% over 2017 to a volume of about 1.55 billion €.

Iron castings registered in 2018 a total production volume of 164,162 tons (an increase of 4.8%). Sales figures rose by 4.6% to about 427 million €.

The production volume of ductile cast iron amounted to 109,731 tons, i.e. an increase of 6.6% over the volume of 2017.

Steel castings increased to 11,443 tons (+ 6.3% compared to 2017).

Production of grey castings went up marginally by 0.2% compared to 2017 and reached a volume of 42,988 tons.

Non-iron castings registered a production increase of 1.1%; sales went up by 4.0%.

Employment

In 2018 the branch provided employment to a total of 7,286 persons (employees and workers), i.e. an increase of 2.6% over 2017.

Fortunately, the number of industrial apprentices trained in professions related to our branch (foundry technology and metal foundrymen) increased again with regard to 2017.

Generally speaking, demand for low-skilled workers goes down; the growing shortage of skilled labour is a concern to our companies.

Incoming orders

All in all, the utilization of capacities in 2018 was positive. Only at the end of the year there was a drop in new orders.

Investment plans

The trend of investment activities remains positive.

Personnel cost

Minimum wage rises according to the collective wage agreement amount in different employment groups to 3.0% - 3.6%, an average increase of 3.46%. The minimum rise amounted to 80.- €.

Supply of commodities and energy

In 2018 commodity prices fluctuated and increased significantly towards the end of the year.

According to the Austrian Energy Agency energy prices in 2018 increased again compared to 2017.

From mid-2015 to the beginning of 2018, oil-based fuels were still below the general inflation rate but now they are clearly above it. However, current price trends have not reached the extent of 2010 and 2011.

Gas and electricity registered price increases in 2018. On the one hand, this was due to a rise in cost of fossil fuels, such as oil, gas and coal over the last few years, but the increase of prices of CO₂-certificates had an even stronger impact. From 1st October 2018, the splitting of the German-Austrian electricity price area also drove prices up.

Cost development

Our survey revealed an average cost increase of 2.97% for the whole branch.

Outlook 2019

Due to sales problems in the automotive industry, no growth is expected for 2019 and there is only hope for a sideways trend.

* * * * *

General economic situation

2018

Economic growth slowed from 1,7% in 2017 to 1,4% in 2018 as exports growth was not enough to offset the impact of weakening private consumption growth.

Export grew by 3,5%, against 4,5% in 2017. This slowdown was mainly due to weakening of the dynamics in world trade and Europeans economies.

Business investment increased by only 1,6%. They were still supported by a high degree of capacity utilization, the improvement of profitability and the low credit cost. However, business confidence eroded regularly during the year.

The growth of private **consumption** slew down in 2018, from 1,1% to 0,6%:

- household income grew by 1,2%. As in the previous years, it was backed by strong job creations. However automatic indexation, based on the so-called "health index" was slightly below the global inflation rate (where the impact of petroleum prices is higher).
- households confidence decreased in 2018, with a negative impact on their consumption.

Residential investment by remained stable in 2018. The low interest rates remain an important support for housing demand.

2019

Growth of GDP is expected to further decelerate this year, to 1,2%.

Exports should further slowdown to reach 2,7%. General business climate is deteriorating and uncertainty on international market is growing. Furthermore, gains in competitiveness are now limited.

In spite of a less strong investment climate, **business investment** are forecasted to rise by 2,7%.

The private **consumption** is expected to accelerate in 2019, and reach 1,8%. Mainly thanks to a stronger growth (2,1%) of the disposable income, supported by higher indexation and fiscal measures.

Growth of households' **housing investment** will also be supported by the growth in disposable income and by the still low mortgage rates. It is expected to reach 1,6%.

Inflation

Belgian inflation remained high in 2018, at 2,1%. This is due to specific factors regarding electricity prices, but also the impact of higher oil prices.

For 2019, it is expected that the gap with the lower level of inflation in Europe will be reduced and that Belgian inflation will settle at 1,6%.

Labour market

Employment creation remained strong in 2018, with a net increase of 58 100 jobs. In 2019, jobs in the private sector will further benefit of the high level of activity. Government employment, however, is expected to remain stable. Overall, employment should increase by 44 300 jobs.

The harmonized Eurostat unemployment rate should therefrom fall from 5.9% in 2018 to 5.5% 2019.

The situation in the major casting customer industries

	2012/ 2011	2013/ 2012	2014/ 2013	2015/ 2014	2016/ 2015	2017/ 2016	2018/ 2017	2019/ 2018
Mechanical engineering	4,0	-1,2	0,2	-0,2	3,0	2,5	1,2	3
Metal product	-2,2	-0,9	1,0	-1,9	2,3	4	2,3	2,5
Automobile	-5,9	-7,1	0,8	-10	-0,5	-0,5	-6	1

Last year, mechanical engineering unexpectedly grew by 1,2%. Given the impact of a major close down mid-2017 and difficulties to recruit qualified people, we only expected a stabilization. It turned out that the demand for the product of the sector has been higher than anticipated. For 2019, we expect the trend to remain positive. However, the business barometer for the sector is improving is more hesitant since the beginning of the year, indicating a weakening business environment.

The growth in the metal product industry is expected to remain close to its level of last year. The sector is still benefitting of the strong demand from the construction sector. Also business investment in Belgium and Europe is still at a high level.

In automobile, the demand for passengers cars and commercial vehicles in Europe remained high in 2018, supporting the activity of the sector. However, the production remained subdued by the transition of our assembly plants to new models of passengers cars. At the beginning of 2019, this transition has yet to be fully completed. Furthermore, sub-contractors for car makers are suffering from the general slowdown of the automobile sector in Europe. However, producers of commercial vehicles are still benefitting of a strong demand. In the 1st quarter of the year, the production of the automobile sector is close to its value of the 1st quarter 2018.

Developments in the foundry industry

The production of the Belgian foundry industry decreased in 2018. With about 79.600 tons, the level was 2,1% below the production of 2017. Contrary to previous years, this decline was generalized in the different types of casting productions.

Iron casting

In iron casting, the biggest sub-sector of the Belgian foundry industry, the production decreases by 1,9% to 69.894 tons. The year on year evolution was positive during the first quarter of the year, before turning negative for the next three quarters.

Steel casting

At 7.358 tons, steel casting production declined by 3,7% compared with 2017. This fall has been more limited than in 2015 and 2016, where the particular situation of the biggest plant in the sub-sector had a strong negative impact. The quarterly figures show a stabilization of the production of steel casting at the end of last year.

Non-ferrous casting

With 2.227 tons in 2018, the production in the non-ferrous casting was 3,9% below its level of 2017. After a positive evolution during the first 3 months of the year, growth was negative during the 3 following quarters.

Cost development

Energy

Electricity: According to Eurostat statistics, Belgian electricity market prices for industrial users increased in 2018 (before VAT). During the 2nd half of the year, prices (before taxes) for consumers between 2000 and 20000 Mwh were 4,5% higher than during the second half of 2017. For consumers between 20000 and 70000 MWH, the (before VAT) price increase reached 9,8%. Prices before VAT remain in Belgium 13% lower than in the EU and 13,4% lower than in the euro area.

Gas: Belgian market price for industrial consumer of natural gas also increased in 2018. The growth of 9,7% in the 2nd semester compared with the 2nd semester 2017 was of about the same magnitude than in EU (+10,8%) and the euro area (+9,3%). The difference in prices remains high : -19,7% compared with the EU and -21,7% compared with the euro area.

Wagecost

Average wage in 2018 was 1,5% higher than in 2017. This growth is due to the automatic indexations in July 2017 of +1,69% and 2018 of +1,44%.

For 2019, we expect an automatic indexation of 1,9% in July. As no increase above inflation is expected, nor a further reduction in social contribution foreseen, this should result in an increase of labour cost of 1,8% for the whole year.

Outlook for the coming months

For the coming months, business surveys in the foundry industry produced signals of a slight improvement at the beginning of the year.

This is the case for the assessment of the order book: in April 2019, the proportion of foundries regarding their orders as being "lower than normal for the period of the year" is stable, between 25% and 30%. In April, about 1/4 of the participating plants were judging their order book at a "high" level.

Furthermore, the average secured duration of activity also improved since January. In April, it was at its highest level since end 2011 (3,9 months). This is another sign that the business climate of the sector is consolidating.

However, the assessment of capacity utilization has been deteriorating during the last quarters. It is now below its long term average (75%).

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The Finnish Technology Industry as a whole

The turnover of technology industry companies in Finland grew by 6 per cent in 2018 from 2017. Growth was steady in all the main sectors. About half of the increase was attributable to volume growth and half to increase in sale value due to rising world market prices of raw materials and components. In 2018, the turnover amounted to EUR 77 billion. In 2008, prior to the financial crisis, the turnover of technology industry companies in Finland totalled EUR 86 billion. At the end of December, the value of order books was 3 per cent higher than at the end of September, and 10 per cent higher than in December 2017.

The number of personnel employed by technology industry companies in Finland grew by almost 4 per cent in 2018 from the 2017 average. The industry employed some 311,000 people, up 11,000 from 2017. Technology industry companies' recruitment activities also decreased towards the end of the year. They recruited a total of 50,000 new employees in 2018. In 2017, total recruitments came to 42,500. Sixty-seven per cent of these employees were hired by SMEs. Some companies were increasing their personnel, while others were hiring new employees due to retirements and employee turnover.

Mechanical Engineering in Finland

The turnover of mechanical engineering companies (machinery, metal products and vehicles) in Finland increased by 6 per cent in 2018 from 2017. In 2018, the turnover amounted to EUR 31.7 billion. In 2008, prior to the financial crisis, the mechanical engineering industry's turnover in Finland totalled EUR 33.3 billion. At the end of December, the value of order books was 3 per cent higher than at the end of September, and 12 per cent higher than in December 2017.

The number of personnel in mechanical engineering companies in Finland grew by 4 per cent in 2018 from the 2017 average. The industry employed some 133,000 people, up 5,000 from 2017.

Metals Industry in Finland

The turnover of metals industry companies (steel products, non-ferrous metals, **castings** and metallic minerals) in Finland grew 7 per cent in 2018 from 2017. Most of the turnover growth is attributable to higher sales prices. These are due to the rising world market prices since 2016. In 2018, the turnover amounted to EUR 10.8 billion. In 2007, prior to the financial crisis, the metals industry turnover in Finland totalled EUR 11.1 billion.

The number of personnel employed by metals industry companies in Finland grew by less than 2 per cent in 2018 from the 2017 average. The industry employed some 16,400 people, up 250 from 2017.

The Foundry Industry in Finland

Foundry industry as a whole

In the year 2018 the total production of castings in Finland were about the same level as in the year 2017. The production of iron and steel castings was 64.645 tons which is 2,5% less compared to year 2017. Iron and nodular iron casting production decreased about 2,2%, and steel casting production decreased about 5,2%. Metal castings production was 5.526 tons, which is about 6,3% less than the previous year. In the other hand the value of the casting production of Finnish foundries was 265 m€, which is 16% more compared to year 2017.

Grey cast iron sector in Finland

Overview of the Finnish grey cast iron production, year 2018:

	2018	2017	%
• Number of GJL foundries	11	11	
• GJL production	18.390 t	19.523 t	- 6%
• Value of the GJL production	37,73 m€	37,47 m€	+ 1%
• Export of GJL castings	3.599 t	5.182 t	- 31%
• Employees in iron foundries	800	741	+ 8%

Ductile cast iron sector in Finland

Overview of the Finnish ductile cast iron production, year 2018:

	2018	2017	%
• Number of GJS foundries	11	11	
• GJS production	36.161 t	36.251 t	0%
• Value of the GJS production	89,21 m€	76,68 m€	+ 16%
• Export of GJS castings	14.893 t	18.656 t	- 20%
• Employees in iron foundries	800	741	+ 8%

Steel castings sector in Finland

Overview of the Finnish steel casting production, year 2018:

	2018	2017	%
• Number of steel foundries	7	7	
• Steel casting production	10.094 t	10.643 t	- 5%
• Value of the GS production	76,08 m€	66,30 m€	+ 15%
• Export of GS castings	2.945 t	1.471 t	+ 102%
• Employees in GS foundries	563	577	- 2%

Non-ferrous casting sector in Finland

Overview of the Finnish non-ferrous casting production, year 2018:

	2018	2017	%
• Number of non-ferrous foundries	14	14	
• Non-ferrous production	5.526 t	5.896 t	- 6%
• Value of the non-ferrous production	62,10 m€	62,48 m€	- 1%
• Export of non-ferrous castings	2.591 t	2.469 t	+ 5%
• Employees in non-ferrous foundries	413	413	0 %

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Macroeconomic developments

	% in 2018	% in 2019 (excepted)	% in 2020 (excepted)
GDP	+1.6	+1.3	+1
Inflation	+1.9	+1.4	+1.7
Unemployment rate	8.8	8.8	8.9
Industrial production	+1	+0.8	1

In an international context which remains uncertain and marked by protectionist tensions, the economic activity in the Eurozone and in France is showing signs that it is fading.

In Q4 2018, the French economy is likely to improve at only 0.2%. Then growth is expected to recover at the beginning of 2019 (+0.4% in Q1 2019, then +0.3% in Q2 2019) in line with domestic demand and in particular households' consumption.

In terms of annual averages, carry-over effect of growth in France is likely to stand at +1.0% at mid-2019 (after +1.5% forecasted for 2018 as a whole). The annual carry-over effect of purchasing power (measured at a global level) will probably increase to +2.0% at mid-2019 (after a growth of 1.4% in 2018 as a whole).

The growth of the French economy reached +1.6% in 2018. At the same time, GDP grew by +1.5% for Germany and +1.8% for the euro area. The increase is limited to +0.8% for the Italian economy. The evolution of the global context accompanies the slowdown of French growth; the latter is mainly supported by the good orientation of the investment of companies. Household consumption grew by +1.1% compared to +1.8% in 2017. The unemployment rate is reduced to 8.8% at the end of 2018 against +9.1% at the end of 2017. With regard to prospects, 2019 growth could be limited in magnitude. According to the Rexecode Institute, the macroeconomic Outlook reflects a slowdown. French GDP growth is expected to decrease to +1.3% in 2019 and +1% in 2020.

In this global macroeconomic context the evolution of inflation remains relatively moderate, because after a price increase of +1.9% in 2018, inflation is expected to rise only by +1.4% in 2018 and +1.7% in 2019.

Situation of the foundry industries

The activity of the foundry industries, all sectors continue to grow:

- Total production increased by +3.4% (in tons).
- Total billings also increased by +1.7%

This growth benefited both the ferrous smelting sector (+0.7%) and the non-ferrous smelter (+12.6%).

As for the customer market analysis, the good business conditions of the major customers contributed to the overall growth of the Foundry sector. This situation is very favorable for the building and the public works. The transport equipment and automotive sectors recorded a strong increase in the first half of 2018, followed by a brake in the third quarter 2019. The economy is still favorable for mechanics. Orders from these sectors are growing throughout the year 2018.

In total, ferrous and non-ferrous smelters produced 1,781,000 tons in 2018, compared with 1,722,000 tons in 2017 and 1,628,000 tons in 2016.

The total production value of the foundry industries is estimated to reach 5.7 billion euros in 2018, up +1.7% compared to the previous year.

Evolution of employment

The French foundry industry's workforce was maintained in 2018 (+0.01%) after. The number of employees is estimated at 30 025 persons at the end of December 2018. The number of companies in the Foundry sector remained at 380 in 2018 (< 10 persons included).

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The German Economy and the Casting Customer Industries

Macroeconomic developments

The economic situation in Germany was characterised by moderate economic growth in 2018. According to first calculations of the Federal Statistical Office (Destatis), the price adjusted gross domestic product (GDP) was 1.5% higher in 2018 than in the previous year. The German economy thus grew the ninth year in a row, although growth has lost momentum. In the previous two years, the price adjusted GDP had increased by 2.2% each. A longer-term view shows that German economic growth in 2018 exceeded the average growth rate of the last ten years (+1.2%).

Positive contributions to growth came mainly from domestic demand in 2018. Both household final consumption expenditure (+1.0%) and government final consumption expenditure (+1.1%) were up on the previous year. However, the growth rates were markedly lower than in the preceding three years. Total price-adjusted gross capital formation rose 4.8% year-on-year. Gross fixed capital formation in machinery and equipment was up 4.5% on the previous year. Gross fixed capital formation in construction grew by 3.0% and a particularly significant year-on-year increase was recorded for gross fixed capital formation in public civil engineering. Gross fixed capital formation in other fixed assets, which includes expenditure on research and development, was 0.4% higher than a year earlier. In addition, inventories increased in 2018, which also contributed to growth.

German exports continued to increase on an annual average in 2018, though at a slower pace than in the previous years. Price-adjusted exports of goods and services were up 2.4% on 2017. There was a larger increase in imports (+3.4%) over the same period. Arithmetically, the balance of exports and imports had a slight downward effect on the German GDP growth (-0.2 percentage points).

On the production side of the gross domestic product, almost all sectors contributed to the positive economic trend in 2018. For the first time in five years, short-term economic growth in industry was lower than in the services sector. Total price-adjusted gross value added rose 1.5% in 2018 on the previous year.

Above-average growth rates were recorded for information and communication (+3.7%) and construction (+3.6%). In trade, transport, accommodation and food services, the growth in price adjusted gross value added was above average, too (+2.1%). In industry (excluding construction), which accounts for just over a quarter of the total economy, the relevant growth rate was below average (+1.0%) in 2018.

On an annual average in 2018, the economic performance in Germany was achieved by 44.8 million persons in employment whose place of employment was in Germany. According to first calculations, that was an increase of roughly 562.000 on the previous year. This 1.3% increase was mainly due to a rise in employment subject to social insurance. Higher labor force participation and the immigration of foreign workers offset age-related demographic effects, as had been the case in the preceding years.

General government achieved a record surplus of 59.2 billion euros in 2018 (2017: 34.0 billion euros). At the end of the year, central, state and local government and social security funds recorded a surplus for the fifth time in a row, according to provisional calculations. Measured as a percentage of the gross domestic product at current prices, this was a 1.7% surplus ratio of general government for 2018.

Short term outlook (Results of the July 2019 Ifo Business Survey):

The mood in German C suites is growing uneasy. The Ifo Business Climate Index fell in July from 97.51 to 95.7 points. Companies were less satisfied with their current business situation and are also looking ahead with increased skepticism. The German economy is navigating troubled waters.

In manufacturing, the business climate indicator is in freefall. The situation index took a serious tumble; such a major decline was last seen in February 2009. No improvement is expected in the

short term, as businesses are looking ahead to the next six months with more pessimism. Capacity utilization fell from 85.3 to 83.9 percent and is now just slightly above the long-term average.

In services, the business climate has clouded over. Service providers were somewhat less satisfied with their current situation. Their expectations are slightly pessimistic for the first time since July 2009.

In trade, the index has slid sharply. Companies are assessing their current situation as considerably less positive, and their outlook for the coming months is markedly more skeptical. The decline in the business climate indicator was more pronounced in wholesale than in retail.

Construction proved to be the positive exception this month, with an increase in the business climate index. Although companies assess their current situation as somewhat less positive, they are still looking to the coming months with optimism.

The situation in the major casting customer industries

In 2018 more than 3.4 million new passenger cars were registered in Germany, which is a stable level compared to the previous year. After reaching the highest number of new registrations this decade in 2017, the German passenger car market decreased last year: The car manufacturers produced 5.1 million passenger cars, which is a decrease of 9%, and delivered almost 4 million cars (-9%) from Germany to customers all over the world. Hence, 76% of all passenger cars built in Germany were exported. Accumulated foreign orders over the year almost equaled the level from 2017 (-1%).

New registrations of commercial vehicles increased by 5% to 386.300 units in 2018, thus setting a new record. Sales of light commercial vehicles up to 6 tons rose by 5% in 2018 to reach 291.100 units – also a new record. The German Association of the Automotive Industry (VDA) expects a rise of 1% for 2019. Therefore, in 2019 the volume of the segment will even slightly exceed the result of the previous year. The market for commercial vehicles over 6 tons exceeded the 2017 figure. A total of 88.461 heavy trucks were newly registered (+2%). But in 2019 the growth is expected to decrease by 1%.

The demand for buses in 2018 showed a stabilisation over the previous year. In total, 6.700 buses were newly registered (0%). This is still the highest figure since 1993. In 2018, sales of trailers stabilised as well and 307.000 trailers were newly registered. Nevertheless, within this group demand for semi-trailers was dynamic and grew by 11% to 40.600 units.

German production of mechanical engineering in 2018 exceeded the previous year's result by 2.1%. In particular, the first ten months of 2018 were stronger with production growth of 3.6% than the closing months, which were significantly weaker and even negative in December. The production value for the past year is estimated at 224 billion euros. Capacity utilization in mechanical engineering was 91% until July. This represented the highest level of capacity utilization since 2009. As a result of declining incoming orders, the capacity utilization rate has fallen slightly since July, although it remained at a high level. Overall, the incoming orders were 5% higher than in 2017.

In 2018, German machinery exports rose by nearly 9 billion euros (+5.3%) to 177.8 billion euros despite an uncertain international environment. Exports to European markets showed a slight acceleration in growth: German machinery exports to the Euro-partner countries rose by 6.3%, while those to the EU-28 increased by 6.6%. Exports to some important overseas markets expanded even faster: Exports to China rose by 9.6%, exports to the USA by 7.1%.

In 2018, the output of crude steel in Germany was registered with a volume of 42.4 million tons, 2.0% lower than in 2017. The World Steel Association (worldsteel) forecasts a plus in steel demand of 0.3% (170.2 million tons) for the EU in 2019.

After a good year 2017 with a growth rate of plus 3% the residential building sector grew by 2.8% in 2018. Public building investments increased by 1.1%. Other sectors (e.g. Investments in civil engineering) were also stable in the black. All in all, the volume of the building industry increased by 2.4% in 2018.

Developments in the foundry industry

In 2018, Germany's iron and steel foundries received orders for around 4.1 million tons of castings. Compared to 2017, this marks a decrease of 1.6%. Orders from the biggest customer industry, motor vehicle engineering, were 3.3% lower than the year before (2.26 million tons). At 1 million tons, the volume of orders from the mechanical-engineering industry was up by 0.4% compared to the previous year. Circa 0.8 million tons of parts for miscellaneous applications were ordered, a level that is 0.8% higher than in the preceding year.

Germany's foundries focused on non-ferrous components received an order volume of 1.2 million tons. The demand went down by 4.5% compared to 2017. With approximately 77% of incoming orders the vehicle industry is dominating the non-ferrous sector. The nominal demand dropped by 6.9% (950.000 tons). The foundries related to mechanical engineering received orders with a volume of 9.650 tons (-1.6%). Nearly 270.000 tons of miscellaneous parts were ordered, which is an increase of 5%.

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 2018, the weight of castings produced by Germany's iron and steel foundries amounted to 4.25 million tons. Compared to 2017 this corresponds to a 1.7% increase. By looking at the two major customer industries, casting production for the motor vehicle industry declined by 0.3% to 2.3 million tons, while production for the mechanical engineering sector rose by 1.1% to 1.1 million 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 820.000 tons, 8.8% more than the previous year.

Non-ferrous foundries registered a production decrease of 2.4%, correlating with a volume of 1.18 million tons of castings. While almost 80% were produced for the vehicle industry (940.800 tons), this output dropped by 2.5%. The casting of non-ferrous components for all other customer industries fell by 2.2% and therefore had a volume of almost 235.800 tons.

In 2018, 33.5% of the total production volume was exported directly. All in all, 1.82 million tons were sold to costumers abroad, representing a 2.3% increase.

By the end of 2018, orders in stock equaled a weight of more than 1.6 million tons of ferrous castings, 4.2% lower than at the end of 2017. The non-ferrous back orders had a volume of approximately 283.000 tons (-22%).

Capacity utilization in the iron (grey and nodular) foundry industry amounted to 90.9% in 2018. In comparison to 2017, this means an increase of 6.3 percentage points. Steel foundries have reported a capacity utilization of 81.9%, 2.5 percentage points more than in 2017. Capacity utilization in the non-ferrous foundry industry is calculated as 87.7% in 2018 (plus 9.3 percentage points). Capacity utilization in ferrous-, steel and non-ferrous foundries cannot be compared.

The employment situation

As of December 2018, Germany's foundries (ferrous and non-ferrous) employed circa 78.900 persons, 1.4% more than at the end of 2017. This figure corresponds with 396 foundries (survey cut-off at <50 employees per company).

At the end of 2018, 577 foundries (ferrous and non-ferrous, no cut-off!) were operating in Germany.

Investment plans

In 2018, a volume of 625 million euros was invested by German foundries. The investments were constant compared to the previous year (the data of 2017 was revised).

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.

For 2018 it should be further noted: Compared to the previous year, the development was very different. While prices in 2017 experienced not only considerable fluctuations but also significant price developments, both momentum and increases in 2018 remained within reasonable limits. In principle, however, the observed fluctuations reveal that prices in spring and summer are slightly above the prices at yearend.

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.

Lower price fluctuation compared to previous years facilitates planning in many respects. Nonetheless, no foundry can "absorb" major price changes since production can virtually not be delayed. The costs of raw materials can thus only be calculated separately and on a daily basis. After all, price increases of raw materials of only 10% results in additional 2.5% prime costs. In many cases, this alone would completely erode the often meager return on sales in our industry. Fortunately, this risk was much lower in 2018 than in previous years.

Raw material prices are subject to pronounced economic fluctuations. As far as the current economic cycle is concerned, prices bottomed out at the turn of 2015/2016. Since then, they have tended to be much firmer. In 2017, they were dampened by the 15% appreciation of the Euro against the US dollar, whereas the 5% Euro depreciation in 2018, among other factors, caused prices to rise by around 9 to 17%. On the other hand, Aluminium prices fell slightly or remained at least almost constant. Copper prices also fell slightly by around 5%, while Zinc even recorded a discount of around 17%. For German prices, the further development of the external value of the Euro will be of fundamental importance.

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 personnel costs: the agreements of the collective bargaining partners (employer and employee representatives) deserve special recognition. Their agreement was particularly high for 2018; a further increase in personnel costs of 4.1% in 2019 is expected to result from the already negotiated collective agreement. Although only half of German companies are still covered by collective agreements, the shortage of skilled workers tightens the situation in the nexus of correspondingly rising wage expectations. In addition, the statutory additional costs (from social insurance) must be mentioned, too. Finally, absences due to illness, the number of public holidays, overtime and shift bonuses as well as voluntary benefits have an influence on the annual development

of personnel costs. Of all these factors, only a few are known and published. For others, assumptions have to be made, particularly emphasizing the different legal systems across CAEF member states.

For 2018, the following can be summarized:
Employee salaries were raised by 4.3% on 1 April 2018.

At the same time in 2018

The pension insurance was reduced from 18.70% to 18.60%, half of which to carry by employers, and The levy of insolvency money was reduced slightly from 0.09 to 0.06% of the gross remuneration subject to allocation.

These changes result in an increase in personnel costs of 4.5% in 2018 (viewed from the extremes).

Since the existing collective agreement provides for a one-off payment of EUR 400 in addition to the agreed 27.5% of the average monthly salary in 2019, a total increase of 4.1% is expected for 2019. Moreover, the additional health insurance contribution of 0.90% (parity) will be reintroduced.

With personnel costs accounting for 30% of sales cost, an increase of 4.5% results in a rise in cost of goods sold of 1.35% in 2018. If the change in personnel costs, with a share of about 41%, is related to production costs (i.e. cost of goods sold excluding raw material costs), these rose by 1.84% in 2018.

If personnel costs increase by a further 4.1% in 2019, this will result in an increase of 1.23% in cost of goods sold and 1.68 % in production costs.

Energy

Measured against the peak prices for (crude) oil from summer 2014, prices in 2018 remained below this level. Nevertheless, 2018 was the second consecutive year in which oil prices rose (by around 3%). On US dollar basis the price is yet still almost 10% lower than in 2014. One of the decisive factors was the weakening Euro, which has made the US dollar-based energy source oil respectively more expensive to import.

Electricity prices are primarily determined through individual company conditions. The timing and duration of energy contracts, in addition to the demanded quantity, grid fees and granted peaks, substantially influence not only the level but also the evolution of electricity costs. At the same time, country-individual regulations considering renewable energy sources have had and will increasingly have an impact on electricity prices. In this respect, the 4% increase in electricity prices reported by the German Federal Statistical Office in 2018 should definitely be subject to internal reviews, particularly at the background of country-specific regulations.

Coke prices increased until June 2018 compared to December 2017. Prices fell again in the course of the year and stayed below the previous year's level on average in 2018, even though December 2018 showed a significant increase of around 12% compared to November.

At around 1%, gas prices in 2018 hardly increased at all.

Foundries which melt in a crucible with gas are likely to have experienced a particular relief. Conversely, foundries using electricity as melting energy had to bear significant cost increases. In 2019, the development of costs is thus likely to be again determined by melting energy and changing political circumstances.

Energy costs account for 13% of production costs.

Miscellaneous

2017 was characterized by significant price increases for some foundry-specific input materials (e.g. furan resin and abrasives), which altered their direction in 2018. With such major changes, forecasts

are always difficult and subject to high degrees of uncertainty. It can therefore neither be ruled out that the price increase will continue nor that the situation will return to normal in 2019.

Summary

On the basis of our calculations, it was shown how the developments described in 2018 would have affected cost prices in very different ways in some cases. The increases in wage and salary costs and the prices for operating materials had a major impact in 2018. However, the dynamics of energy costs, not least electricity and rising oil prices, furthermore resulted in considerable additional costs. As in many years, the greatest cost increases were consequently incurred by foundries with labor-intensive processes such as hand-molded castings.

If the cost of raw materials is excluded and only the increase in production costs is considered, then a cost increase of around 2.6% can be expected in 2018

The Situation in the Material Sectors

Grey cast iron

Throughout 2018, production increased slightly by 0.6% to 2.435 million tons. The output of motor vehicle components fell by 0.2% to less than 1.660 million tons. The volume of casted parts for mechanical engineering decreased by 2.4% to 517.600 tons. Other grey iron components (including moulds and railway parts, fittings and components for the steel industry) reached an output volume of 262.000 tons (+12.7%).

Iron foundries received orders for approximately 1.428 million tons of castings from the motor vehicle industry, which is a 7.4% decrease. The demand of the mechanical engineering industry reached a volume of 496.000 tons. Thereby, the orders fell by 2.4%. Orders for parts for miscellaneous applications made of cast iron reached a volume of 221.000 tons, 2.1% less than in the preceding year.

At the end of December 2018, the order backlog amounted to nearly 870.000 tons, 11.8% lower compared to the end of December 2017.

Ductile cast iron (nodular and malleable)

At 1.64 million tons, the production of ductile iron castings was increased by 3% compared to the year before. A separate calculation of nodular and malleable castings is not possible anymore, because of the low volume of malleable castings. Nonetheless, malleable castings have their specific markets. The output of motor vehicle components fell by 0.7% to 661.700 tons. The volume of casted parts for mechanical engineering grew by 3.9% to 539.000 tons. Other components reached an output volume of 436.000 tons (+8.1%).

At the ductile iron sector the volume of incoming orders reached 1.782 million tons (+3%). Ductile iron foundries received orders for nearly 824.500 tons of castings from the motor vehicle industry, which is an increase of 4.4%. With plus 2.4% compared to the order volume received the year before, the demand of the mechanical engineering industry reached a volume of 520.500 tons. Orders for parts for miscellaneous applications made of ductile cast iron reached a volume of 436.800 tons, 1% more than in the preceding year.

At the end of December 2018, the order backlog amounted to 731.500 tons, 4.6% more compared to the end of December 2017.

Steel

Throughout 2018, production of steel castings grew by 5.1% (184.700 tons). The output of motor vehicle components increased by 5.2% to 13.300 tons. The volume of casted parts for mechanical engineering rose by 10% to 47.700 tons. Other components reached an output volume of 123.700 tons (+3.3%).

At 192.000 tons, the volume of orders received by the producers of steel castings in 2018 was increased by 6.5% compared to the year before. Steel foundries received orders for 14.400 tons of castings from the motor vehicle industry, an upturn of 6%. The demand of the mechanical engineering industry reached a volume of 52.500 tons (+9.2%). Orders for parts for miscellaneous applications made of steel castings reached a volume of 125.000 tons, 5.5% more than in the preceding year.

At the end of December 2018, the order backlog amounted to 71.000 tons. The order cushion was 25.1% higher compared to the end of December 2017.

Non-ferrous Metal Castings

In 2018 the production of aluminium castings decreased by 2.4% (1 million tons). For the magnesium sector the production reached a level of more than 18.000 tons (stable). The output of copper castings fell by 1.2%. The level was more than 79.000 tons. 59.200 tons of zinc castings were produced, marking a decrease of 4.8%.

Aluminium foundries received orders for 1 million tons (-5%). 89.7% of the demand (935.200 tons) came from the vehicle industry. Down by 36.8% compared to the order volume received the year before, the demand of magnesium castings reached a volume of 17.500 tons. Orders for parts made of copper castings reached a volume of 93.4000 tons, 4.2% higher as the year before. Foundries producing casted parts from zinc logged an order level of almost 70.000 tons (+5.2%).

Source: BDG, Stat. BA, VDA, VDMA, IFO, WV Stahl

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General Situation

The economy data are based upon the report of Economy Research Institute (GKI), Hungary

The economic expansion is forecasted to slow gradually in the next years. Private consumption will be supported by real-wage gains and record-high employment, while investment will be boosted by housing construction and corporate activity, as well as disbursements of EU structural funds, albeit at a slower rate. Tight labour market conditions will raise inflation, projected to reach 4% in 2019. As capacity constraints bite, demand is increasingly met by imports, and growth will gradually lose momentum. Fiscal and monetary policies are expansionary. Tax cuts and public spending increases were introduced in 2018, and further tax cuts are scheduled for 2019. The central bank has maintained policy rates on hold although headline inflation exceeds its central target of 3%. Macroeconomic policies should be tightened gradually to prevent the economy from overheating. This would also help the authorities to meet their target of reducing public debt below 50% of GDP in the medium term.

Percentage of manufacturing firms pointing to labour shortages as a factor limiting production.

Source: Eurostat Industry database; and OECD Main Economic Indicators database

The unemployment rate has fallen to a historically low level. Labour shortages have emerged, accompanied by strong and broad-based wage increases helping to preserve a high level of income equality, and restarting income convergence.

Strong economic growth is projected to continue

% change	2018	2019	2020
Gross domestic product (GDP)	4.6	3.9	3.3
Private consumption	5.4	4.6	4.0
Gross fixed capital formation	17.7	10.6	4.8
Exports	4.9	4.8	5.9
Imports	7.3	6.9	6.3
Unemployment rate	3.7	3.5	3.4
Consumer price index	3.0	4.0	4.0
Current account (% of GDP)	0.8	-0.9	-1.2

Inflation is projected to continue to rise towards the central bank's upper bound of the 3% inflation target with a +/-1% tolerance band.

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 relative low.

Population ageing will accelerate over the coming decades, leading to an old-age dependency ratio that is just above EU's. Ageing is increasing spending pressures.

Percentages of GDP	2020	2040	2070
Total public pensions	9.0	9.4	11.2
Health Care	5.1	5.6	5.7
long-term care	0.7	0.9	1.1
Memo: Old-age dependency ration	31.3	41.6	52.0

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.

The Foundry sector

The tendencies of the Hungarian foundry industry in 2018 showed again a small but still significant average growth of the total Hungarian foundry Industry than in 2017. Some sectors especially iron and steel (even the two biggest iron foundries have increased the performances were forecasted before) and castings of copper based alloys in average have reduced the production in 2017, even in 2018.

For the Hungarian foundries all together 2018 was successful year again. It is visible that the Hungarian foundry industry is in a moderate growth and together is stabil supplier for the automobile and vehicle industry of EU – first of all in the sectors of aluminium and iron casting businesses. Together with the above mentioned situation of the iron and steel foundries' production the group of companies are involved at investment castings is slowly increased year after year. The productions of steel, heavy metal, zinc and magnesium castings are stagnating or even a little bit reduced like during the last years. The foundry supplier companies at the sector increased their activities. The biggest problem is constantly the missing well-educated skilled workers (foundrymen) and university level educated trained foundry engineers. After 10 years in 4 different regions have started again the skilled foundry man education in secondary school so from 2018 some 40-45 students will finish every year the foundry-man secondary schools. At the Miskolc University the so called dual BSc education has started in 2015 with a large interest of students and foundries too - the dual MSc education is already under developing too.

Hungarian casting productions, 2017 - 2018 - Value in tons

Denomination	2017	2018
Grey iron casting	24 210	21 616
Nodular iron castings	37 783	38 468
Compacted graphite iron castings	16 740	26 969
Alloyed iron castings	389	401
Malleable iron castings	10	7
Total iron castings	79 132	87 452
Unalloyed steel castings	2 216	1 361
Alloyed steel castings	911	1 452
Total steel castings	3 127	2 813
Aluminium gravity die castings	61 328	57 410
Aluminium pressure die castings	61 450	78 962
Aluminium sand castings	124	146
Total aluminium castings	123 902	136 518
Bronze castings	417	230
Brass castings	1 305	475
Zinc castings	1 717	1 610
Other heavy metal castings	76	93
Total heavy metal castings incl. investment cast.	3 515	2 408
Magnesium castings	327	273
TOTAL	210 003	228 462
Investment casting all together in total	753	762

The basically export orientated Hungarian foundries still have relative steady market position. It is more than average that the budgets for 2019 are created on an optimistic basis because of the very strong Hungarian export dependence at the foundry sector: everything is depending of the market situation of the countries to where appr. 85% of the Hungarian casting export is stationary fulfilled.

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Macroeconomic developments

GDP expanded by 0.9 percent in 2018 as a whole, slowing compared with 2017. The slight decline in the final quarter of the year (-0.1 per cent) is attributable to the change in stocks, which shaved almost half a percentage point off GDP growth. Output was supported by the favourable performance of foreign trade, though world trade contracted. Growth in gross fixed investment and household consumption was barely positive.

According to the latest data based on the Bank of Italy's forecasting models, Italy's GDP may have increased by around 0.1 per cent in the first three months of 2019. It is estimated that, during the first quarter, economic activity expanded on average in industry excluding construction, but remained weak in the service and construction sectors. Instead, goods transport flows decreased sharply. In manufacturing, the indicator of firms' confidence diminished further as did the purchasing managers' index (PMI), remaining below the threshold compatible with expansion for the second consecutive quarter.

Industrial production

According to the available indicators, industrial production returned to growth in the first three months of this year, although business surveys indicate that firms are still cautious in their assessments of demand and of the general state of the economy.

The first cyclical indicators for 2019 and the business surveys point to weaker investment plans, which could be the result of the uncertain global outlook and reductions in tax incentives. After falling in the last part of 2018, industrial production increased compared with the previous month both in January (by 1.9 per cent) and in February (by 0.8 per cent), mainly owing to growth in the consumer goods sector.

Qualitative indicators

The qualitative indicators are less favourable overall. Business confidence in the manufacturing sector declined in March, reflecting the deterioration in the assessment and expectations for orders and production levels. The purchasing managers' indices (PMI) for manufacturing firms were still below the level indicating an expansion; the situation was better for services, for which indices rose above this level in March. The firms interviewed for the Survey on Inflation and Growth Expectations reported negative assessments of the present economic situation but slightly more positive ones in relation to expected demand for their own products in the next three months, especially foreign demand.

Planned investment

Investment increased by 0.3 per cent in the fourth quarter, after declining last summer, buoyed by the recovery in investment in capital goods. Uncertainty over the renewal and size of tax incentives for this year may have induced firms to bring forward their investment spending to before the end of 2018. The reduction in the incentives for this year and the growing uncertainty about the economy appear to have put a brake on investment in the winter months, as suggested by the indicators currently available.

Foreign demand

Italian exports rose at a steady pace in the fourth quarter of 2018, despite the drop in international trade; nevertheless, uncertainty stemming from global conditions weighs on the outlook. During last year, the gradual improvement in exports and international tourism inflows helped Italy maintain a large current account surplus despite the increase in the energy deficit. In the first two months of 2019 as a whole, foreign investors started purchasing Italian portfolio securities again.

In the fourth quarter of 2018, the volume of exports of goods and services grew by 1.3 percent quarter on quarter. Exports of goods (up by 1.0 per cent) were stronger outside the European Union, owing in part to the improvement in price competitiveness under way since last spring; exports within the EU instead recorded weaker growth. The expansion in exports was driven mainly by the pharmaceutical sector and by some of the traditional 'made in Italy' sectors (food, clothing and leather products); by contrast, exports of transport equipment and electrical machinery fell significantly. Exports of goods and services grew by 1.9 per cent in 2018.

Labour market

The number of persons in employment increased by 0.9 per cent on average in 2018; after rising in the first half of the year, it stabilized in the summer months and declined slightly in the autumn (-0.2 per cent on the previous period). Employment instead remained practically unchanged in industry excluding construction and continued to grow in other private services. The number of hours worked fell in all the main sectors except construction.

Price developments

In 2018, the average annual rate of change of consumer prices was +1.2% and excluding energy and unprocessed food, core inflation was +0.7%, the same as in 2017 for both. Inflation declined in the first quarter of 2019. Contributory factors included the weak cyclical conditions and the slowdown in the prices of energy products recorded between the end of 2018 and January of this year. Firms, households and analysts revised down their inflation expectations.

Developments in the foundry industry

In 2018, the performance of Italian foundries was positive overall (+1.2% and a production volume of 2,262,949 tonnes), but decidedly slower in comparison with 2017, when the growth rate was higher than +7%. More specifically, the statistics indicate that there was a discontinuous economic trend over the year not only for the different fields of specialisation, but also within the same sector.

Some market segments, such as cast iron and non-ferrous metal castings, experienced a good start in 2018 thanks to a positive trend continuing from the previous year that was, however, destined to gradually weaken; and, over the months, the annual growth estimates had to be revalued downwards.

In the case of cast steel, instead, the beginning of the year was still strongly conditioned by the economic weakness of the sector over the previous three years, but the negative trend then gradually reversed to follow a path of recovery. Leaving aside the situation of the steel foundries, the economic cycle of which can often be more volatile than that of other market segments, the end of 2018 was extremely negative for cast iron and non-ferrous metal foundries. The decline in production activity recorded by these sectors left a negative statistical legacy for the first months of the current year, which did not begin with particularly thrilling prospects.

The production of castings in Italy in 2018: an overview

Production (tonnes)	2018	% variation on 2017
<i>Iron castings</i>	1,196,200	+1.3%
<i>Steel castings</i>	56,896	+5.1%
<i>Investment castings</i>	1,758	+2.3%
Total ferrous castings	1,254,853	+1.5%
<i>Aluminium castings</i>	856,016	+0.9%
<i>Zinc castings</i>	73,303	+1.8%
<i>Brass, bronze and copper castings</i>	69,729	-1.8%
<i>Magnesium castings</i>	8,065	+0.8%
<i>Other non-ferrous castings</i>	983	+40.5%
Total non-ferrous castings	1,008,095	+0.8%
Total castings	2,262,949	+1.2%

Foreign demand for ferrous castings

In 2018, foreign demand helped to ensure a good level of production: the export value of ferrous castings (cast iron and steel), according to ISTAT foreign trade data, amounted to 1.8 billion euros, up 10% on 2017, while imports amounted to 1 billion euros, 4.2% more than in 2017. The balance of trade was positive and amounted to 774 million euros. The volume flows of ferrous castings (cast iron

and steel) showed an annual export growth of +10% (521,000 tonnes), while imports amounted to 544,000 tonnes and increased at a rate of +6.9% compared to 2017. The balance in this case was therefore negative for around 23,000 tonnes. Considering the main macro-classes into which exports are subdivided, there was a growth of 22% in volumes of exports of castings under a general tariff heading, including cast-iron, iron or steel products not recognised as parts of machinery or appliances and not otherwise classifiable. The export of valves, on the other hand, remained much the same as in 2017, while the export of parts of agricultural machinery was down (-2%) and transport was fractionally up at +1%. Compared to the results of last year, the signs for 2019 from the foreign channel are however more negative, due in particular to the current weakness of the main market for Italian foundries, which is suffering due to the decline in world demand for investment goods and the car crisis caused by the change in diesel car regulations.

Cast Iron

Despite a very positive 2017 (+7.8%), the evolutionary dynamics for cast iron foundries in Italy proved unsatisfactory last year due to particular weakness of the sector also within Europe.

After a first four-month period of significant expansion with production growth rates around 5 per cent, the end of the summer holidays marked the first signs of a slowdown in production which gradually led to a real downturn that fully manifested itself in the October-December period with a tendential drop of 1.8% compared to the same period of the previous year.

Thanks to the positive growth achieved in the last part of 2017, 2018 nevertheless saw production increase by +1.3%, with different trends for the various destination sectors.

Customer industries

The production of castings destined for the mechanical industry, after the strong progress of 2017 (+10.5% in volume), remained at +1.9% in 2018. This production sector constitutes the first outlet market for cast iron castings and absorbed 49.2% of total volumes, equal to around 589,000 tonnes. More specifically, 359,200 tonnes of grey iron castings (+1.9% compared to 2017) and 229,230 tonnes of ductile (malleable and spheroidal) cast iron were destined for the mechanical industry with an increase of +2% on the previous year.

The reduced growth was also due to the volumes produced by automotive foundries which felt the repercussions of the sharp slowdown in a market that in recent years had given decisive impetus to the industry of ferrous and non-ferrous castings. According to the preliminary data by ANFIA, the number of cars produced in 2018 was around 671,000, 10% less than in 2017, with 57% destined for export. The total number of vehicles produced in 2018 was 1.06 million units, down 7% compared to 2017 and with 66% destined for export. Before the downturn, the production of motor vehicles had steadily grown since 2014 with an average annual production in the last five years exceeding one million vehicles, 32% more than the production of the five-year period 2009-2013 which, when the economic crisis was in full swing, recorded an annual average production of 760 thousand motor vehicles.

The transport industry in 2018 absorbed 388,295 tonnes of cast iron, or 32.5% of the total output, including 257,223 tonnes of grey cast iron and 131,072 tonnes of ductile cast iron. For this production segment, the year ended with an increase of +1.8%, considerably lower than that in the period 2013 - 2017, when the compound annual growth rate (CAGR) was +4.5%, with annual peaks in double figures. The decline in sales in Germany, the main destination market, had a significant impact on this sector.

Last year's results presented a similar dynamic between the production of ductile and grey cast iron for the transport industry, with the former slightly higher (+2.2%) than the latter (+1.6%).

In general, the poor trend was due to a contraction in domestic demand and a slowdown in the export channel, which however showed a better performance, at least until the end of 2018. In the international context of 2019 the evolution of the automotive sector has progressively worsened, with recessionary dynamics that are increasingly worrying and extended worldwide. According to ANFIA, the significant investments in the development of cleaner powertrains and in the sale of less polluting vehicles as imposed by the regulations currently under discussion would become difficult to sustain if market volumes were to drop to levels similar to those recorded in the worst period of the economic

crisis.

Also negative was the figure for the production of castings destined for the construction sector (-3.6%) which, despite the improvement recorded in 2017, continued to maintain the negative trend that had characterised the sector for over a decade. The output produced was just over 87,000 tonnes and the production gap compared to pre-crisis levels grew to -66%. The main productions classified in this category are manhole covers, grids, trapdoors and inspection hatches, all products that suffered the aggressive competition of Eastern European countries in the 90s and subsequently that of Asian countries: a dynamic that led to drastic rationalisation of Italian companies, now reduced to very few production units. Last year's volumes represented 7.3% of the total of iron castings, or one third of the incidence that characterised the sector less than twenty years ago. The situation of castings destined for the steel industry, instead, followed a dichotomous trend: the production of ingot moulds grew by +7% compared to 2017, while cylinders experienced a marked slowdown, equal to -6% compared to the brilliant performance of the previous year (+30%). Overall, 33,524 tonnes of castings were destined for the steel industry. Finally, the push induced by production in the "other castings" category, which accounted for 8% of the total, was rather weak (+1%).

Evolution of the various types of cast iron

<i>Production (tonnes)</i>	<i>2018</i>	<i>% variation on 2017</i>
Grey cast iron	767,602	+1.6%
Ductile cast iron	428,598	+0.8%

Steel castings

The economic evolution of steel castings for 2018 was not easy to read due to the sheer volatility of the results achieved by individual companies, even within the same sector of specialisation.

The average growth in the sector of +5.1% resulted in an output of steel castings of around 57,000 tonnes.

After the production rebound in 2011 (+15% trend), which allowed for partial recovery from the 2009 collapse (-30%), the production of steel castings between 2012 and 2018 showed a condition of economic weakness, with an average decline in the CAGR of -4%. For this reason the result of last year should be seen in a positive light, as a sign of reversal in the sector.

Evolution of the various types of steel

<i>Production (tonnes)</i>	<i>2018</i>	<i>% variation on 2017</i>
Alloy steel	35,332	+7.0%
Stainless steel	10,583	+5.7%
Carbon steel	10,981	-1.1%

Customer industries

Among the various production destinations, negative results were registered for steel castings destined for the mining industry (-2.1% compared to 2017) and the steel industry (-1.9%). Under the first category come castings for quarries, mines, and construction and earthmoving machinery, while demand for steel castings is fed both by new investments in machinery for the steel and metallurgical industry in general, and by spare parts for certain components of machines.

The quantities produced grew by +15.1% for the automotive industry, by +5.9% for the railway industry and by +14% for the naval industry. Steel castings for the construction industry also achieved a positive result (+6.2%). This category includes castings destined for cement production machinery and castings directly used in the construction of public works. Finally, the production of castings destined for the mechanical industry was very positive, ending 2018 up +11%.

The end of 2018 therefore offered steel foundries some cause for optimism, which seems to have been confirmed in the first few months of 2019. Achieving the best results are, in particular, the

foundries with mechanised systems for the production of small castings mainly for the mechanical industry, while foundries that produce large castings destined for plants for the production of energy and oil & gas are still affected by critical issues and uncertainty.

A study conducted by the Assofond Study Centre on a sample of associated companies indicates a recovery in the sector, at least in the short term. The number of orders is growing and companies have also expressed greater satisfaction with the orders placed. The companies also predict, for the first half of 2019, an increase in production volumes both as a whole and for allocation to foreign markets: once again, exports should therefore be driving the sector.

Non-ferrous castings

In 2018, for the first time since 2014, the production rate of non-ferrous metal foundries suffered a major slowdown. The results observed last year were still positive, but with a growth in volume of 0.8% and an overall output that settled at just over one million tonnes. (1,008,095 tonnes).

In the last three years the automotive sector helped to boost the production of non-ferrous metal foundries, primarily aluminium, almost 60% of the total output of which was destined for the sector. From 2015 to 2017, the average annual growth of the sector was +5.4%, and in 2017 there was an increase on the previous year of +7%.

The slowdown in 2018 affected all non-ferrous metals and caused some to follow a negative trend. Aluminium output stood at 856,016 tonnes, with a growth rate of +0.9% compared to the previous year. Slightly more sustained was the production rate of zinc and alloy castings (73,303 tonnes), with an increase of +1.8%, while the category of red metals (copper, brass and bronze) fell on average by 1.8% compared to 2017. The production level of the latter stood at around 69,729 tonnes. With a growth of just 0.9%, the production of magnesium castings reached instead a volume of 8,065 tonnes.

Evolution of non-ferrous castings

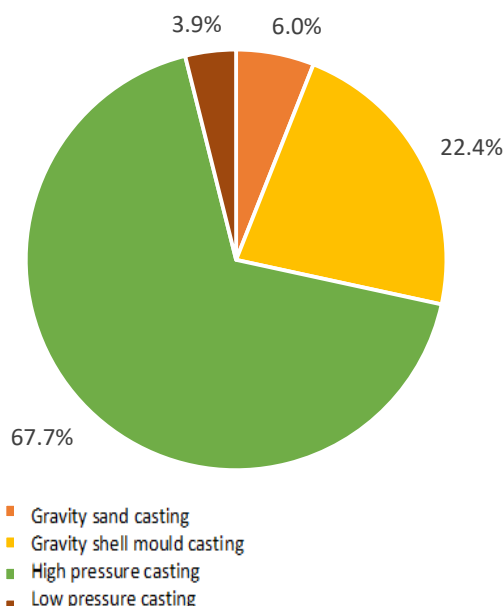
<i>Production (tonnes)</i>	<i>2018</i>	<i>% variation on 2017</i>
<i>Aluminium castings</i>	<i>856,016</i>	<i>+0.9%</i>
<i>Zinc castings</i>	<i>73,303</i>	<i>+1.8%</i>
<i>Brass, bronze and copper castings</i>	<i>69,729</i>	<i>-1.8%</i>
<i>Magnesium castings</i>	<i>8,065</i>	<i>+0.8%</i>
<i>Other non-ferrous castings</i>	<i>983</i>	<i>+40.5%</i>

Production for casting technology

Production for diecasting technology achieved the best result, with a growth rate of +1.9% and a volume of 682,481 tonnes.

Incidence (%) on production in 2018

Non-ferrous production (tonnes) x casting technology



Growth was more modest for gravity sand casting: +0.8% with a volume of 60,486 tonnes. There was a negative trend, instead, for the production of shell castings, which stood at 225,813 tonnes (-1.8%) and low pressure casting, at 39,316 tonnes, down by -2.9%.

Customer industries

The incidence of transport in the context of light alloys grew further. Compared to 2017, the percentage by weight of the total went from 57% to 57.5% in 2018.

Almost 579,655 tonnes were destined for this outlet market in 2017 and growth was +1.6% compared to the volumes of the previous year. Among the other production sectors, electrical engineering, which absorbed 9.5% of the production of non-ferrous castings, increased by +3.6%. The contribution to sectoral development of the mechanical industry, with a weight of 8.7% of the total, was equal to +3.1%.

The other two production categories, i.e. construction and durable goods, for which 136,093 and 82,204 tonnes of castings were made respectively, decreased by around -0.4% for construction and -9.6% for durable goods (household appliances, etc.).

Structural business statistics of Foundry Industry (year 2016)

	enterprises	turnover	production value	value added at factor cost	gross operating surplus
	N.				(thousands)
245: foundries	1.044	6.168.896	6.234.049	1.800.373	638.701
2451: iron foundries	147	1.546.469	1.602.581	477.519	169.200
2452: steel foundries	38	448.564	452.793	160.784	53.985
Totale ferrous	185	1.995.033	2.055.374	638.303	223.185
2453: light non ferrous foundries	512	2.556.989	2.573.265	782.469	297.512
2454: Other non ferrous foundries	347	1.616.874	1.605.410	379.601	118.004
Total non ferrous	859	4.173.863	4.178.675	1.162.070	415.516

	personnel costs	personnel costs	wages and salaries	gross investment in tangible goods	persons employed	employees	hours worked by employees
	of euros)				N.	N.	(thousands)
245: foundries	4.461.519	1.161.678	813.593	360.598	27.569	26.246	42.997
2451: iron foundries	1.107.576	308.323	207.849	98.410	6.994	6.864	10.961
2452: steel foundries	292.340	106.798	74.454	20.196	2.260	2.225	3.708
Totale ferrous	1.399.916	415.121	282.303	118.606	9.254	9.089	14.669
2453: light non ferrous foundries	1.806.070	484.952	345.858	139.310	11.926	11.206	18.550
2454: Other non ferrous foundries	1.255.533	261.605	185.432	102.682	6.389	5.951	9.778
Total non ferrous	3.061.603	746.557	531.290	241.992	18.315	17.157	28.328

Production costs trend

The first part of 2018 showed a generally fluctuating trend for the prices of raw materials of ferrous metals (scrap and pig iron) but with a growth lower than the inflation recorded in 2017.

In particular, for scrap, an average increase of around +12% (+25% growth in 2017) is observed, and for pig iron an increase between +7% and +10%, in relation to the category (+20% / +24% in the average 2017 vs 2016).

In 2018, the total inflation of the index of Direct transformation inputs (DTI) of the "Electric furnace" and "Cupola furnace" was:

- +5% (Electric Furnace)
- +4% (Cupola Furnace)

The contribution to the total inflation comes from all three aggregates in which the index has been conventionally broken down with the following intensities:

- (+10%) (Ferroalloys ... carburizing graphite)
- Energy consumption
- +4% "cupola furnace"
- +6% "electric furnace"
- Auxiliary materials (+2%) (sands, binders, filters, ..)

General Economic Development

The moderate upturn in the Norwegian economy continues. Even lower growth prospects internationally or a marked long-term fall in the oil fund may, nevertheless, create problems for businesses and fiscal policy.

	2013	2014	2015	2016	2017	2018	2019E
GDP	0,6	2,2	1,6	1,0	1,8	1,4	2,0
-Mainland Norway	2,3	2,3	1,1	0,8	1,8	2,2	2,4
Unemployment rate	3,5	3,5	4,4	4,7	4,2	3,8	3,7
Consumer prices	2,1	2,0	2,1	3,6	1,8	2,7	2,3
Investment in the Oil-sector	17,1	-3,2	-15,0	-14,7	-4,0	3,3	12,9

Weaker growth trajectory internationally

The international economic upturn is expected to continue for the seventh consecutive year in 2019. With the prospect of a weaker international business cycle, continued uncertainty in global trading conditions and internal turmoil, particularly in Europe, we envisage that the growth trajectory will be weaker than was forecast in our last projection. Furthermore, the downside risk is still high, especially with regard to the course of the real economy. The further escalation of ongoing trade conflicts is still a possibility.

Balanced development in the Norwegian economy

Much of the upturn that is behind us in the Norwegian economy was characterised by expansionary fiscal policy, low interest rates and wage moderation. During the course of last year, fiscal policy became more neutral, wage growth picked up slightly and Norges Bank increased interest rates for the first time in more than two years. In the years ahead, it is assumed that these driving forces will yield a neutral or contractive impetus. The picture is reversed for investments in the petroleum industry, where marked growth is expected in 2019. Overall, it appears that the Norwegian economy will be almost cyclically neutral throughout the period up to 2022.

Neutral fiscal policy

Fiscal policy has gradually become more cyclically neutral following the highly expansive fiscal policy that was implemented in the period 2014 – 2016 in order to mitigate the negative impetus from the fall in oil prices in 2014. We assume that the fiscal policy will remain almost cyclically neutral and the petroleum revenue spending will be just over 2 per cent of the value of the oil fund in 2022. This moderate petroleum revenue spending is reasonable based on the economic situation up to 2022, the desire to secure a buffer to meet any major changes in the value of the oil fund and the need to finance the higher expenditure as a result of the ageing population.

Petroleum investment has reached a turning point

Starting in 2013, petroleum investment fell for four consecutive years. At the start of 2018, the trend shifted to a slight upturn, and we expect the investments to grow markedly in 2019. The development projects Johan Sverdrup phase 2 and Johan Castberg are the main drivers of this development. Lower costs and an assumed oil price of just over USD 60 per barrel also make many other projects profitable. In the period 2020 – 2022, the investment level is expected to remain close to the level in 2019, which is around 19 per cent lower than the record level of 2013.

Moderate growth expected in business investment

Higher interest rates, moderate growth in the Norwegian economy and considerable uncertainty about international developments are set to dampen investment growth going forward. We estimate that

growth in business investment will fall from just over 3 per cent this year to between 1 and 2 per cent towards 2022.

Moderate consumption growth expected

The consumption is driven by the course of household income, wealth and interest rates. Wage earnings, which are the main source of income for households, are expected to increase in the years ahead, both as a result of higher annual wage growth and employment growth. The ageing of the population will also push up welfare benefits. Conversely, the weak development in real house prices and higher interest rates are expected to curb consumption growth. Overall, this means that growth in consumption in the years ahead will be just over the trend growth in mainland Norway, but nevertheless considerably lower than in earlier upturns.

Wage growth continues to increase

After a peak of just over 5 per cent at the start of 2016, unemployment was 3.7 per cent on average from November 2018 to January 2019, according to Statistics Norway's Labour Force Survey (LFS). As a yearly average, we expect unemployment to fall to 3.6 per cent towards the end of the projection period. Going forward, an improved economic situation, lower unemployment and lower energy prices will provide the basis for higher wage growth, both nominally and in real terms. In 2022, the nominal annual wage growth is expected to rise to around 3.5 per cent. Consequently, the labour cost share in manufacturing in the years ahead will be approaching the average for the past 30 years.

Considerable uncertainty concerning exchange rate developments

Interest rates are now higher in Norway than in the euro area, which, based on the theory of uncovered interest parity, suggests that the krone is set to weaken. At the same time, the krone is at a weak level in relation to the historical relative price development between the euro area and Norway. This signifies a stronger krone. The considerable uncertainty surrounding the exchange rate developments going forward coupled with the unclear direction of the sum of the economic driving forces has led us to assume an unchanged exchange rate throughout the projection period. This means that one euro will cost around NOK 9.7. Compared with our projection in December 2018, this indicates a weaker krone.

Inflation

The CPI and CPI-ATE growth rates are both estimated at 2.3 per cent for 2019. Higher power prices and a weaker krone have pushed up the projections for price growth since our last projection. With a somewhat more tightened labour market, it appears that wage growth, and thereby domestic cost growth, will increase. Underlying inflation is expected to increase from around 1.5 per cent in the past two years to just over 2 per cent in the years ahead.

About one percentage point higher interest rates up to the end of 2022

Norges Bank's operational goal is for the annual growth in consumer prices to reach almost 2 per cent over time. In addition, monetary policy shall help stabilise production and employment at around the highest possible level that is consistent with price stability over time. The upturn in the Norwegian economy seems set to continue at a moderate pace and it is expected that Norges Bank will increase the key policy rate further. We have assumed four interest rate hikes of 0.25 percentage points by the end of 2022. The interest rate on credit lines is therefore expected to reach around 4 per cent in 2022.

The Norwegian Foundry Industry

In 2018 the Norwegian foundries had higher turnover than they had budgeted for. There was also a slight increase in volume.

This positive development is expected to continue in 2019 as well, both regarding volume and incoming orders. The foundries expect stable or increased profit in 2019.

Main macroeconomic indicators in Poland in 2018

- In 2018 GDP in Poland increased by 5,1%, with domestic demand as a main growth driver.
- A growth in sold industrial production amounted to 6.7%.
- In the manufacturing section, production grew by 6,4%.
- Construction and assembly production grew by 8,4%.
- Consumer Price Index was higher by 1.0%.
- The number of registered unemployed amounted to 1,016.7 thousand (down by 9,8%).
- Registered unemployment rate amounted to 6.1%.
- The Monetary Policy Council did not change the interest rates.
- The Polish currency weakened against both the US dollar and euro.

Foundry industry in Poland

The number of foundry plants in Poland at the end of 2018 is estimated at around 400 foundries (including small craft enterprises with small production and employment).

According to statistical data, 60% of foundry plants in Poland are independent foundries. The remaining 40% are usually the departments of larger companies in which the casting department supplies the castings to their final products.

According to statistics, the number of foundries employing more than 250 people constitutes 5.5% of the total number of foundries, and total employment in this group is estimated at 10,750. The remaining 94.5% are foundries employing less than 250 people (total 13 550 employees), the SME sector. Employment in the SME sector amounts to 55.8% of total employment and production of 38.5% of total cast production.

The production of castings including ferrous and non-ferrous alloys in 2018 - calculated on the estimated data was 1,036,500 tons.

Castings from grey and alloy cast iron have the largest share in the total castings production, although over the last decade their share in total castings has been declining. In 2018 it amounted to 48%.

Ductile iron castings account for 15% of total castings. Malleable iron castings have the smallest share, 1.0% of total casting production. For several years there has been a downward trend in the share of cast iron production in malleable cast iron in total production.

In 2018 the share of steel castings amounted to 5% of the total cast production.

Non-ferrous metal castings accounted for 34,6% of total cast production in 2018. In the last decade, the production of non-ferrous metal castings has shown an uptrend.

The share of exports in total castings production in 2018 was higher than in previous years and amounted to 61%.

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General Economy

The external environment of the Portuguese economy has been generally favourable in 2018. The global economy has continued to expand at a solid pace against a background of continuing favourable financial and labour market conditions and relatively high levels of confidence of economic agents in the major advanced economies. However, certain previously anticipated downward risks have materialised during the year, namely an increase in trade protectionism and episodes of financial turmoil in certain more vulnerable emerging economies, in a context of monetary policy normalisation in the USA and lower risk appetite by international investors.

According to the latest results of the INE (National Statistical Institute) in 2018, Gross Domestic Product (GDP) registered a real growth of +2,1 % in real terms, in relation to the previous year (+2,2% in 2017 and +1,5% in 2016).

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 2018, with a total export value of 87,9 billion euros (61,6 billion euros in goods and 26,3 billion euros in services), represents growth of 3,7% over the previous year of 2017. The exports component reached a weight in GDP of 43,6%, and contributed 1,7% to the economic growth. In the next two years, exports are expected to record annual average growth between 3.5% and 4%, which translates into a deceleration from the very sharp growth pace recorded in 2017 (7,8%).

According to current projections, GDP is expected to slow down gradually over the projection horizon, from 2,1% in 2018 to 1,8% in 2019, 1,7% in 2020 and 1,6% in 2021, approaching the average of available estimates for potential output growth. The recovery period subsequent to 2013 was characterised by the continued increase in the weight of exports in GDP, a trend that extends to all components, with emphasis on tourism, which presented the greatest cumulative growth. Corporate Gross Fixed Capital Formation (GFCF) accelerated significantly during this period, and is expected to reach at the end of the horizon a level 8% higher than that observed in 2008. In contrast, public and housing investment remain below the average observed prior to the international financial crisis. The weight of private consumption in GDP remained relatively unchanged during this period. The current projections prolong these trends, which are consistent with a more sustainable growth profile for the Portuguese economy. Net of import content, the profile projected for GDP reflects a progressively lower contribution of exports in 2019-21. The contribution made by domestic demand net of import content to GDP growth is also projected to decrease slightly over the projection horizon 2019-2021.

Over the projection horizon, the Portuguese economy is expected to maintain a net lending position towards the rest of the world, as observed since 2012. The combined current and capital account balance is expected to stand at 1.3% of GDP on average in 2018-20, relatively unchanged from 2017, increasing to 1.6% at the end of the horizon. However, a change in composition is anticipated given that a decrease in the goods and services balance is projected to be offset by developments in the primary income and capital accounts.

The employment situation

Following the dynamic growth in 2018, employment is expected to return to growth rates that are, on average, more in line with its historical relationship with activity over the projection horizon 2019-2021, which implies that the unemployment rate will continue to fall, although more slowly than in recent years. The unemployment rate achieved in 2018 was 7% of the active population, and should decrease for the upcoming years (6,2% in 2019, 5,5% in 2020, 5,3% in 2021).

Total and working age population developments remain a structural supply constraint of the economy. Despite the projected deceleration trend, employment is expected to remain the main factor contributing to growth of GDP per capita on average over the projection horizon 2019-2021.

Rising productivity is the crucial factor for further Portuguese economic growth. The projected evolution of GDP and employment is expected to translate into the apparent work productivity in the period 2019-21, after the approximately zero in 2018 and negative changes in the period 2014-2017.

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 70% of the global Portuguese production.

The Portuguese foundry sector exports 91,3% of the total production (in weight) mainly to the European market.

Production

In 2018, the outcome of the Portuguese foundry industry was roughly 202 thousand tons, 145,4 thousand tons from the ferrous sector and 56,6 thousand tons from the non-ferrous sector.

The steel foundries had a decrease production for the second consecutive year. Although the steel and the nodular iron foundries decrease the production from 2017 to 2018 the ferrous foundries sector grew 0,6% as a total. The non-ferrous production improved 4,6%, mainly due to the aluminium (die casting) and zinc (die casting). The copper-based alloys decrease the production from 2017 to 2018.

Ferrous Production

Cast Iron

The cast iron globally increased 4,6% due to new business for the iron foundries.

Ductile Cast Iron (Nodular)

The nodular iron castings globally decreased 0,5%, mainly due to unexpected deceleration in the market needs in last quarter of 2018, especially in the automotive industry.

Steel Castings

The steel castings foundries faced a reduction of 10,2% in production, due to the global contraction of the market since 2017. The steel foundries were facing market uncertainty (gas & oil) that had a big impact in the annual output.

Non Ferrous Casting Production

In 2018, the non-ferrous metal castings production, as a whole, registered an improvement of 4,6%. The light castings (aluminium pressure diecasting) increase the production 7,5% comparing to the previous year, this improvement was mainly due to the increase of the automotive industry needs. The zinc alloys (pressure diecasting and gravity die casting) increased the production 8,4% comparing to 2017. The copper castings alloys decreased 1,8%, mainly due to the slowdown of the market needs of the shipbuilding industry (ship propellers).

New casting plants and investments

In 2018 no new foundries was installed in Portugal, although during the year occurred several investments in the existing foundries to increase the plant output capacity.

Global investments in the non-ferrous sector during 2018 was around 25 M€, mainly in aluminum foundries. In 2019, the planned investments will decrease for a total amount of 14 M€.

Global investments in the ferrous sector during 2018 was around 7 M€, mainly supported by iron casting. In 2019, the planned investment will go up to 16 M€.

Industrial Cost

In 2018, the price of most raw materials on the ferrous sector was constant throughout the year.

In the non-ferrous sector, the price of raw materials reflected a decrease on aluminium, zinc and copper alloys along the year.

Electricity – in 2018 there was an increase in the electricity cost. Although 2018 showed a decrease of the network access and use tariffs, the increase in the energy price provoked the increase of the electricity bill for the industrial consumers. For 2019 is expected a decrease of the electricity cost.

The gas price decreased from 2017 to 2018 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 2019 this tendency of decrease of gas price will continue.

Due to the economic situation of the country, most of the foundries expect an increase of the wages close or above the inflation for 2019.

Incoming orders

The needs of automotive sector suffered a decrease in the last quarter of 2018. For 2019, a slow recovery of the market needs is foreseen, especially for the high pressure aluminium castings. Incoming orders and production for general engineering also decreased in last quarter of 2018. For 2019, the overall tendencies are positive for the non-ferrous and for the ferrous activities.

Foundry vocational training

The Portuguese Foundry Industry has its own training and vocational center, CINFU, a joint 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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Slovenia – economic trends and foundry production in 2018

Summary

With the easing of economic activity in the international environment, GDP growth will gradually slow this year (3.4%) and in the next two (3.1% and 2.8%); the importance of domestic consumption will increase. Economic growth will continue in 2019–2021, marked by two trends that started last year: the slowdown of economic growth and the changing of its structure towards a larger contribution of domestic consumption and a smaller contribution of exports. *Export* growth will ease further over the forecast period (largely on account of slower GDP growth in Slovenia's trading partners), with the exception of 2020, when it will be slightly higher owing to more working days. Growth in *private consumption* will accelerate somewhat this year amid the continuation of favourable labour market conditions, and gradually slow thereafter amid lower growth in employment. The still strong growth of *investment* will also ease somewhat, especially in the machinery and equipment segment, owing to slower growth in foreign demand. Vigorous growth in construction investment will continue, partly also on account of the increased absorption of EU funds. As the slowdown of *import* growth will be less pronounced owing to relatively robust domestic consumption, the *contribution of international trade to GDP growth* will be slightly negative. The moderation of economic growth will be somewhat faster than predicted in the autumn forecast, primarily owing to less favourable developments internationally.

Export growth will continue to moderate particularly this year and will be lower than import growth over the forecast period; the current account surplus will be down somewhat relative to GDP, though still around 6%. The easing of *export* growth, especially this year, will be a consequence of a pronounced deceleration of *import* growth in Slovenia's trading partners and the absence of one-off domestic factors, which had a favourable impact on growth in the previous two years. Rising labour costs will also be gradually weighing on export growth through deterioration in export competitiveness. Import growth will ease more slowly than the growth of exports, as it will be underpinned by further growth in domestic consumption. The contribution of *net exports* to GDP growth will be slightly negative. The narrowing of the trade surplus in goods, together with the increase in the deficit of primary and secondary incomes, will reduce slightly the current account surplus as a share of GDP in 2019–2021, but it will remain around 6%. The trade surplus in services will continue to rise.

Private consumption growth will strengthen this year under the impact of higher growth in household disposable income, before slowing in the next two years due to a gradual deceleration of employment growth. This year's stronger growth of *private consumption* will be underpinned by accelerated growth in earnings and social transfers and a continuation of relatively robust growth in employment. Household consumption growth will be somewhat lower over the next two years primarily on account of more moderate growth in disposable income amid lower growth in employment. *Employment* will thus continue to rise over the forecast period, albeit more and more slowly amid a contraction in the number of working-age people, lower and lower *unemployment* and more moderate growth in economic activity. The impact of demographic trends on the decline in labour supply will be mitigated slightly by the expected gradual strengthening of net migration inflows and the increase in the labour market participation rate. *Wage growth* will strengthen particularly this year and also, slightly, in the next two, affected not only by the shrinking labour market, but also agreements with the public sector trade unions and legislative changes.

Investment growth will remain relatively robust in 2019–2021. Construction investment will continue to rise at the fastest pace. The growth of *investment in civil-engineering works* will continue, boosted by other public projects and the absorption of EU funds. *Investment in commercial buildings* will also grow further, driven by relatively rapid growth in the service sector. Growth in *residential investment*, whose volume is still low, will pick up. With high capacity utilisation, *investment in machinery and equipment* will also continue to increase, albeit at a more moderate rate owing to the slowdown of economic activity in the international environment and increased uncertainty.

The growth of final government consumption will decline. The gradual slowdown of growth in the 2019–2021 period following last year's increase will be mainly related to lower employment growth

amid the shortage of an appropriately skilled workforce in some sectors and lower expenditure on goods and services.

Inflation will remain moderate, amid somewhat higher growth in prices of services and non-energy commodities. A gradual strengthening of price pressures will influence *inflation*, but it will remain similar to that in 2018 this year amid the assumed lower prices of oil. In the next two years inflation will rise moderately (around 2%). This year we expect a further strengthening of price growth particularly in the service segment, while in the next two years a more pronounced increase is also expected for non-energy industrial goods.

The estimates of the output gap and the majority of non-financial indicators indicate a mature phase of the economic cycle, with growth moderating particularly owing to international developments. The *output gap* will remain positive over the forecast period, peaking in 2020. Several other, particularly non-financial, indicators also indicate a mature phase of the economic cycle, with growth moderating particularly under the impact of the international environment. Indicators pointing in the same direction as the output gap include the still rapid price growth in the property market and the high levels of capacity utilisation and high labour shortages. Other financial and price indicators still record moderate rates of growth. In addition to prices, the volume of bank loans is also rising at a slow pace (in enterprises, it even fell slightly last year).

Among the risks that could lead to different economic growth than forecast in the central scenario, negative risks in the international environment predominate. In circumstances of significant uncertainties, downside risks are associated with risks in the global and European economic environment, which have heightened somewhat since the time of the autumn forecast. Global risks are mainly related to: i) a possible intensification of US protectionist measures and retaliatory counter-measures by its trading partners, ii) a faster easing of economic growth in China than predicted by international institutions, and iii) a faster-than-expected tightening of global financial conditions. In Europe, risks are related to the uncertainty about the time and manner of the UK's withdrawal from the EU and their economic relations in the future (the risk of an unregulated or a so-called hard Brexit), economic policies of some countries (for example, Italy) and – especially over the medium term – political changes. Factors in the domestic environment are largely positive and could lead to somewhat higher economic growth than in the central scenario, particularly higher private consumption in the event of the adoption of economic policy measures (for example, in the area of pensions, wages or tax policy) that would mean higher growth in household disposable income.

Foundry production in the year 2018 was 198.254,50 tons of complete castings. The production was almost the same as in the year 2017. The problems are the same as in the whole Europe's foundry industry. We export more than 80% of the whole production, mostly in Germany, Austria, Italy...

UMAR, Institute of macroeconomic analysis and development

Chamber of Commerce and Industry of Slovenia

Slovenia Foundrymen Society

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Overall Economy and Metal Sector in particular

Spain's GDP have recorded a growth of 2,4% in the last quarter 2018 and an annual growth of 2.5% for 2018 (3.1% in 2017). The perspectives points to a very gradual deceleration in 2019. The European Commission revised one tenth downwards, to 2.1% Spanish GDP for 2019. By 2020, the real GDP variation remains at 1.9%, without changes with respect to previous forecasts.

The Industrial Production Index (IPI) for the year has had a slight increase of 0.8% compared to 2.9% of the previous year. It is worth highlighting the intense deceleration of industrial production in December (in December a variation of -6.6%).

The Business Turnover Index in the Industry maintained a year-on-year growth. In December had -5.3% (0.5% in November). The average variation in the year 2018 of the Business Turnover Index in the Industry is 3.9%.

In the month of December the Industry's New Orders Index decreased by 2.7% compared to the same month of the previous year. The New Orders Index closes 2018 with an increase of 3.7%.

Regarding the labor market, in relative terms, a growth of 2.9% year-on-year is recorded, one tenth less than that registered in December. The Employment grew 2.8% in the fourth quarter of the year, which means that the Employment grew by 566,200 people (2.98% in the last 12 months). In 2018 there has been a decrease in the industry of 3,000 jobs.

The number of Social Security affiliates in the Metal Industry was 768,346 people in December 2018 (13,216 more than in December 2017). In relative terms, an increase of 1.8% year-on-year is recorded.

The average of the year 2018 reached a total of 49,800 unemployed people throughout the metal industry, representing an increase of 7.3% over the previous year.

Foundry Sector

Iron Casting Section. Automotive Casting

In the automotive sector, Spanish foundries, in general, have remained at high levels of occupation throughout the year and some foundries closed the year with increases in production. However, there are other foundries that haven't worked so good, stopping production for a few days.

Looking to the 2019, there is uncertainty in the European automotive sector.

Some foundries have been affected significantly by diesel, while all foundries give great importance to the next evolution of the electric vehicle.

Iron Casting Section. Mechanical Molding

The Wind Sector, for small parts, is weak and is expected to fall in 2019.

The steel sector is a little convulsed.

Iron Casting Section. Manual Molding

The Wind Energy Sector for big-sized parts has had a very good level of occupation and orders throughout the year. 2019 is expected to be a very good year.

In general, most of the Spanish foundries started the year somewhat stronger than they have finished it.

The Machine Tool Sector continues to be weak, with volumes much lower than what was manufactured a few years ago.

The Die Sector is not very good. In October and November, it has been weak. At this moment there is an "impasse", with much uncertainty for 2019.

There is also tremendous concern about the use of substances that have been classified as carcinogenic (respirable crystalline silica and formaldehyde).

In general, maintenance of the production is expected for 2019, although there is uncertainty.

Stainless Steel

The Hydraulic Sector is working with ups and downs.

The Marine Sector is stable and with an upward trend.

The Oil & Gas Sector is well and the Naval Sector is also in good condition.

There is much uncertainty for 2019, although some foundries believe that they will remain or grow by a small percentage.

Steel Castings

The Railway Sector is reasonably well and a good year 2019 is expected. It is working in the medium and long term.

The Die Sector is in good condition, with good volumes at the end of 2018.

The Oil & Gas market is working well. Mining is having ups and downs. Public Work is in a bad situation.

Uptrend in Naval Sector. The Naval Sector has been growing during 2018.

2018 has been a volatile year and there is uncertainty for 2019.

Non Ferrous Castings

Aluminum foundries have decreased their production by around 10%.

For the Zamak there has been a small increase in 2018 compared to 2017.

Raw Materials and Auxiliaries

Analysis of the Evolution of Raw Materials Prices And Auxiliaries in 2018

Scrap prices ended 2018 with prices slightly lower than those of the previous year (-5.66%). The FeMo has undergone a strong increase during the last year (+ 16.56%), while the Nickel has evolved downwards (-5.49%). The FeCr has also evolved downward during the last year (-16.00%). Ferrosilicon stone has evolved downwards too (-14.11%).

Ingot prices have evolved upwards, reaching the end of 2018 above the prices of a year earlier (+10.51% in the case of pig iron ingot and +15.46% in the case of nodular ingot, between December 2017 and December 2018). Scrap has ended the year at the same price as the previous year. Graphite has risen 35% since March 2018 and has remained that way throughout the year.

Sands: They have risen 2.50%.

Shot: It has risen 7%.

Resins: Similar prices or a little lower than those at the end of 2017. The phenolic-alkaline resins and the silicate-ester have remained stable.

Energy costs: In general they have risen by 5% on average in the last year, even when there are companies with different fees of access to networks.

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Economic situation and main indicators

Sweden now has about 10.2 million inhabitants. The number does not increase as fast as in 2016 and 2017 due to reduced immigration. Unemployment is 6.3%, the same figure as for 2017. Unemployment among people with foreign descent is considerably higher, about 20-25%. The wages increased 1.8% for blue collar workers and 2.0% for clerks. The order intake of manufacturing decreased by about 3% in 2018. Inflation in 2018 amounted to about 2.2%. In general, the industry has great difficulties in recruiting younger and well-educated employees. However, the expected recession and continued investments in automation have reduced the need for recruitment somewhat.

The election in autumn 2018 ended in a political stalemate that lasted for several months and then resulted in a new cross-border alliance between traditional left and right parties. As a result of this agreement changes are now being made regarding tax policies and labor laws. However, there is a fundamental agreement about the fact that large investments in the climate area is necessary for the future, and focus must be on renewable energy sources, but new investments in nuclear power are also discussed.

General casting industrial structure

The number of foundries in Sweden is stable and during 2018 we had just less than 100 foundries (about 25 iron foundries, about 10 steel foundries and some 60 metal foundries, mainly aluminum). As usual the customer side is dominated of the automotive sector, and nearly 70% of the total production end up in the transport sector as components in trucks, light cars and construction equipment. In the report for 2017 we announce that the truck manufacture Scania had decided to build a new iron foundry, and it is now under construction. In this report for 2018 we can announce that the other Swedish truck manufacture, Volvo, has decided to update their iron foundry, in order to increase flexibility, productivity and, at the same time, substantially improve the energy efficiency in the foundry. The investment is about 150 Million Euro.

The transformation to electrical drive-trains will have a big influence on a huge amount of the Swedish sub-supplier industry in general, and on the foundry sector in particular. The Scandinavian Automotive Supplier Association has therefore started a national project that will support sub-suppliers who have their focus on components to combustion driven wheicles to increse their capability to change over to components for electrical drive-trains.

Production

The total foundry production has increased with 5,1% between 2018 and 2017. In table 1 below you can see the figures for the total production (tons).

Material	2018	2017	Diff (%)
Iron, total	225 700	214 931	5,0
Steel	22 900	21 750	5,3
Non-ferrous total *	67 270	63 724	5,6
Total production, all materials	315 870	300 405	5,1

Table 1. Total foundry production in Sweden, 2018 and 2017

* Al ~ 48 000, the rest is a mix of Cu, Zn and Mg
Regarding Al we estimate that approx. 75% is High pressure die casting
the rest, approx. 25%, is a mix of Gravity casting and Sand casting.

Since nearly 70% of all cast components ends up in the automotive sector, the ratio between weight and performance of the component is critical when the transport sector needs to become more sustainable. We can therefore see trends such as substitution from iron to aluminum, in a few cases from aluminum to magnesium, but most often, big efforts to optimize the design to gain light weight

properties.

Parallel to light weight challengers we also see customer needs for collecting process data and traceability increasing. This means that big efforts also are being done to install sensors and data collecting equipment on old machines as well as increase the preventive maintenance in order to get higher output from each production hour.

All circumstances described above means that we also need better educated personal in the foundries. We therefore have started several new courses for foundry employees, both traditional in a classroom, but also for distance learning and to be held on site at a foundry. This work is being done in close cooperation with RISE and Jönköping University.

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Situation of the foundry industry

The Swiss foundry industry holds its own in international competition

The Swiss foundry industry generated sales of around 600 million Swiss francs in 2018. In terms of tonnages processed, the 47 companies amalgamated in the Swiss Foundry Association (SFA) together achieved an increase of 1.1% to 53,700 tonnes. Further slight growth is expected for the current year.

Although the competitive pressure did not slacken for the Swiss foundry industry in 2018, the industry was able to benefit from the globally buzzing economic growth and win through with typically Swiss qualities. The specialisation in developing technologically highly complex cast parts combined with increasing automation ensured customers a maximum of pooled innovative drive at advantageous terms and conditions. In addition, the more flexible working time models operating in this country enabled the Swiss foundries to satisfy tailored customer requirements frequently faster and more individually than in foundries in the EU. As suppliers of ready-made, ready-to-install cast parts in the cycle of internationally operating production chains, the Swiss foundries' reliably high level of adherence to delivery deadlines likewise played a major role. All in all, through this the Swiss foundry industry gained lucrative new orders and succeeded in extending existing customer relations worldwide.

In particular, the demand from the automobile, commercial vehicle and aircraft industries evolved encouragingly. New business was also generated in plant construction and mechanical engineering as well as in energy technology. Tonnages delivered by the iron and steel foundries in 2018 was up 0.6 per cent on the previous year at 36,700 tonnes. In the same period, the Swiss light metal foundries achieved an increase in tonnages processed of 3.1 per cent to 13,800 tonnes. Only copper alloys saw a reduction, of 0.8 per cent to 3,200 tonnes compared to the previous year. Across all material groups the Swiss foundry industry production was up on the previous year by 1.1 per cent at 53,700 tonnes. These figures prove that the industry is still growing increasingly, even with reduced added value. Altogether, in 2018 the 47 companies amalgamated in the Swiss Foundry Association achieved total sales of roughly 600 million Swiss francs.

Positive outlook

The SFA is expecting slight growth for 2019, unless the ongoing trade dispute or other political influences result in an economic downturn. To maintain the innovative drive, multi-million investments are constantly being made at practically every location; good skilled workers are likewise being trained or sought at full speed. The Swiss foundry industry offers attractive careers with good future prospects.

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A. Macroeconomic Developments

Following several years of strong growth, the Turkish economy achieved another strong GDP increase by 7,4% in the first quarter and by 5,3% in the second quarter of 2018. While Turkey became the second fastest growing economy among major developing economies in the first quarter, the downward trend in unemployment continued; improvement in inflation remained limited due to the fluctuations in food and energy prices; and steady depreciation of the exchange rate since mid-2017 was intensified during this period. Strong domestic demand, which was one of the major fuels for the previous years' strong growth, this time, became the major reason of the expansion in the current account deficit, together with the commodity prices.

The macroeconomic developments and the political tensions with the US caused intense market volatility in August 2018, which led to a further depreciation of Turkish Lira around 40% in a very short period. Thereafter a recovery process commenced. Expansion in the current account deficit stopped with a strong performance in tourism. Turkey's economy posted a successive current account surplus for the first time after many years. In the last quarter, inflation was slightly improved thanks to the measures taken by the government, the decline in oil prices, relative normalization of the exchange rates and the slowdown in domestic demand; which led to a narrower seasonally and calendar adjusted GDP growth rate of 2,6% in 2018.

GDP has increased by 19% in 2018 at current prices but due to the increasing value of the dollar against lira by 38%, Per Capita GDP in USD contracted by 9% and fell below ten thousand level.

As the economic growth slowed down sharply in Q4, the employment growth stopped and unemployment started to increase. This limited the improvement of the annual labour market figures obtained in 2017 which was below 10% level for the first time since 2013. In 2018, seasonally adjusted data shows that the employment rate dropped 1,6 points to 46,3%; unemployment and youth unemployment rates sharply rose to 12,7% and 23,2% respectively. The presence of around 4 million refugees also adds to social inclusion challenges.

The excessive market volatility in August resulted in significant real sector impacts, including a sharp acceleration in inflation which was already elevated. Year-over-year consumer prices increased by 6 points and reached 25% in September, which has not been seen since 2001 in Turkey. Another financial effect of the volatility in Q3 was widening of the gap between consumer and producer price inflation, caused by the inability of suppliers' to pass on price increases to consumers due to declining demand and more direct exposure of producer prices to exchange rate shocks.

In Q4, declining demand and oil prices, relative normalization of the exchange rates and positive effects of the other measures taken by the government contributed to the first monthly deflation since June 2017. As a result, the deterioration in the annual inflation rates has been limited.

Suppressed domestic demand, declined investment and weakened Turkish Lira has contributed to a sharp deceleration in import demand, whilst exports have accelerated. As a result of export growth outpacing that of imports, the annual export to import ratio increased from 67,1% to 75,3% in 2018, which was the highest ratio in a decade.

These developments, together with the good tourism revenues during the high-tourist season (summer months) helped shift the current account deficit to surplus in the third and fourth quarters of 2018, for the first time after many years. As a result, the current account deficit has narrowed from 5,6% of GDP in 2017 to 3,5% in 2018.

Non-tradable sectors have significantly contracted in 2018 Q4 due to higher costs and credit rationing, which had already started in August with sharply rising commercial lending rates. The sharp drop in credit growth also had an effect on containing current account imbalances going forward. Because

credit to the private sector has been one of the main drivers of Turkey's current account deficit in recent years.

Tradable sectors, on the other hand, grew significantly as exchange rate depreciation has boosted external competitiveness together with the sustained external demand. Therefore, this compensating effect aided the calendar adjusted industrial production index to remain positive for 2018.

Contraction of the industrial production index in the second half of the year was also consistent with the easing in the manufacturing purchasing managers' index (PMI). However, it bottomed out in September and sustained its level just below 45%. In manufacturing, the PMI shows a much stronger outlook for new export orders compared to domestic orders.

Furthermore, the increase in the real sector confidence index continued since September and reached 97,7% in December.

The weakening of economic activity in Turkey became more pronounced in the fourth quarter along with global trends. It is considered that domestic demand may remain under pressure for a while due to the delayed effects of the increases in interest rates and exchange rates in 2018.

Together with the volatility in the world economy and capital flows, the growth rate of Turkey is anticipated to be around 2% in 2019.

B. The Situation in the Major Casting Customer Industries

In 2018 total motor vehicle production decreased by 9% and domestic sales by 35%. The decrease in passenger car production and market (10% and 33% respectively) were the main reasons for the decline in the vehicle industry. Commercial vehicle production fell by 5%, whilst tractor production by 30%.

The domestic machinery market is presumed to be declined by 20%. But a 15% increase in export volume is expected to compensate, to some extent for the loss in domestic demand. The export volume grew by nearly 30% in earth-moving machinery production where a 60% contraction was observed in the domestic market. The agricultural machines industry is also estimated to shrink by 35%.

Falling demand for housing deeply impacted the construction sector. The annual drop in building permit floor area reached 49%, and the total house sales fell by 2,4%. The annual production, domestic sales and export volume of the cement industry all declined, by 10, 11 and 6%, respectively.

Steel production was stable as compared to the previous year.

The installed capacity in electricity production increased by 4% in 2018, where the driving force was the investments in renewable energy resources.

Production in the white goods sector was stable in 2018; the growth was only by 0,4%.

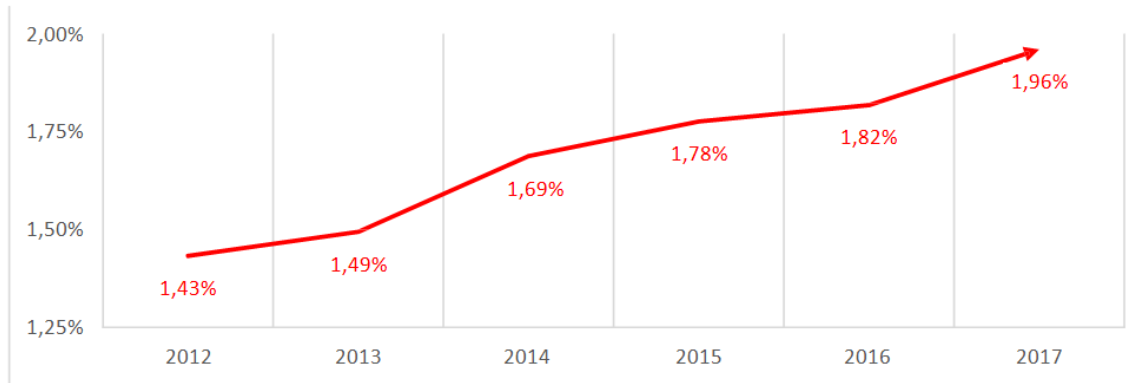
C. Developments in the Foundry Industry

1. Industry Overview

According to the most recent statistics (i.e. AFS's 52nd Census of World Casting Production, which was published in December 2018), in terms of total casting production volume Turkey secured its position as being Europe's 3rd biggest producer; and in terms of ferrous casting production volume as being 2nd. Turkish foundry industry sustained its positive growth and increased its share in global

casting production to nearly 2% level (Figure 1).

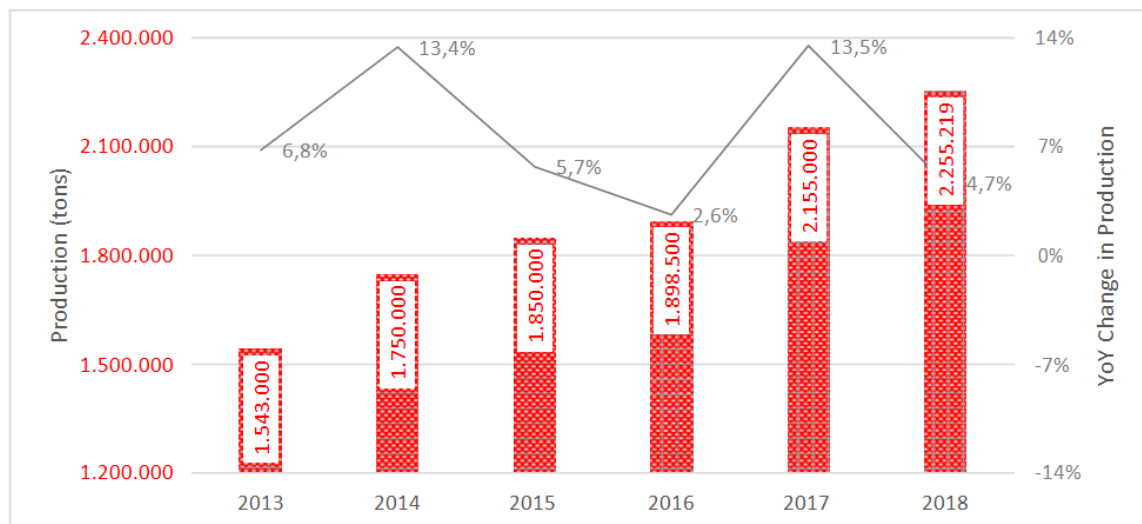
Figure 1: SHARE OF TURKEY IN GLOBAL CASTING PRODUCTION



Source: AFS 52nd Census

In 2018 the total production of the Turkish foundry industry reached 2,3 million tons, 4,7% above 2017 level (Figure 2), with an export volume of around 1,4 million tons.

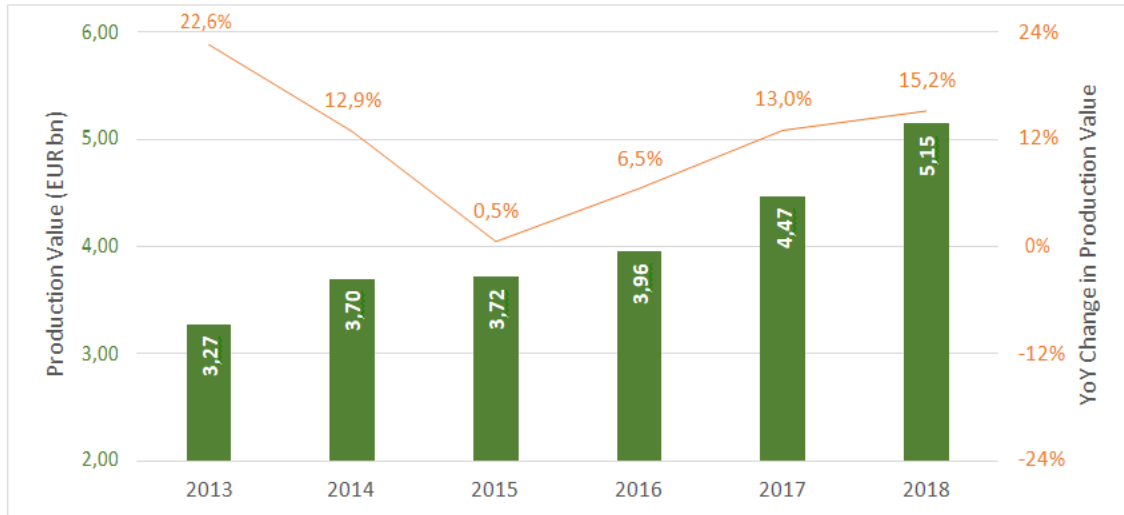
Figure 2: METAL CASTING PRODUCTION



Source: TUDÖKSAD - Turkish Foundry Association

The deceleration is mainly due to the decrease in the production of grey iron castings.

However, the increase in the production value of castings against last year continued with a slight loss of acceleration in growth and reached 5,2 billion Euros (Figure 3).

Figure 3: PRODUCTION VALUE OF METAL CASTINGS

Source: TÜDÖKSAD - Turkish Foundry Association

In 2018, the total production of iron and steel foundries remained constant as it was in 2016. The weight of castings amounted to 1,7 million tons.

On the other hand, the production of non-ferrous foundries was up by 24,3%, which makes more than 100 thousand tons of additional production volume as compared to the previous year in 2018. Nearly 90% of it was enrolled by aluminium foundries and the remaining 10% was by the foundries producing other non-ferrous castings.

Capacity utilization in ferrous foundries declined by around 10 points as compared to 2017 and was recorded as 65,1%. Whereas non-ferrous foundries reported a sustained capacity utilisation of 91,3% in 2018.

2. Investments

Despite the volatile macro-economic conditions in 2018, the investment amount of Turkish foundry industry reached 173 million Euro with a significant, 44% increase as compared to 2017. Investments were mainly on moulding lines, sand reclamation, simulation software and energy efficiency projects.

Compared to 2018, it is not presumed to have an expansion in investments in 2019.

D. The Situation in the Material Sectors

1. Iron Castings

The sharp drop of 16% in grey iron castings production has been compensated by 11% increase in nodular castings; thus the iron castings production declined by 1,9% in total with a production volume of 1,52 million tons in 2018. The contraction in the domestic demand was the primary reason for this decline. Share of iron castings in total production dropped from 72% to 67% in Turkey.

Over the past years, iron foundries have been allocating their capacities on nodular castings. Consequently, for the grey iron castings, capacity utilization was stable at 74% although the production volume has declined sharply. Iron foundries in total reported a capacity utilization of 64% in total.

2. Steel Castings

Except for 2017, steel castings production has been increasing with accelerating growth since 2013. In comparison with 2017, production volume reached 192.372 tons, registering an increase of 13,2%. Capacity utilization has also reached 70%.

3. Non-Ferrous Castings

The investments in capacity increase, especially in HPDC foundries in 2017 yielded a strong growth in aluminium castings in 2018. Production volume increased by 25,3% as compared to the previous year and peaked at 476.253 tons.

Other non-ferrous foundries produced 70.734 tons, up by 17,9% in comparison with 2017.

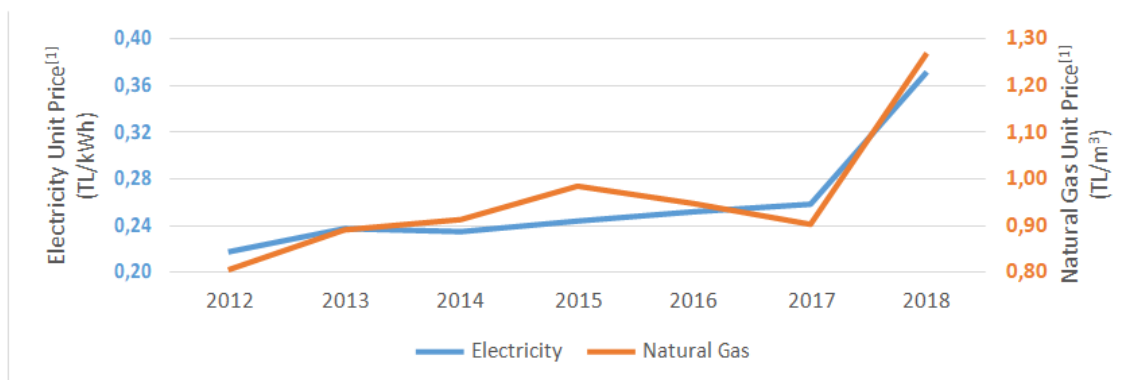
E. Cost Development

Manufacturing costs of foundries are mostly based on foreign exchange rates due to the import of raw materials. 38% YoY increase in TL/USD and a 33% increase in the TL/EUR exchange rates yielded a profound effect on cost development. On the other hand, the increase in domestic PPI in the casting industry again surpassed the overall domestic PPI year-over-year change in 2018.

1. Energy

Both energy and gas prices in industrial consumption rose sharply in 2018. In comparison with the previous year, the electricity market price was up on both TL and Euro basis, by 43,7% and 8,4% respectively. The unit price of natural gas has increased by 40,5% in Turkish Liras and 6,0% in Euros (Figure 4).

Figure 4: ELECTRICITY AND NATURAL GAS PRICE DEVELOPMENT



Source: Turkish Statistical Institute

[1] Average prices paid by industrial consumers for 1 kWh electricity / 1 m3 natural gas including all taxes.

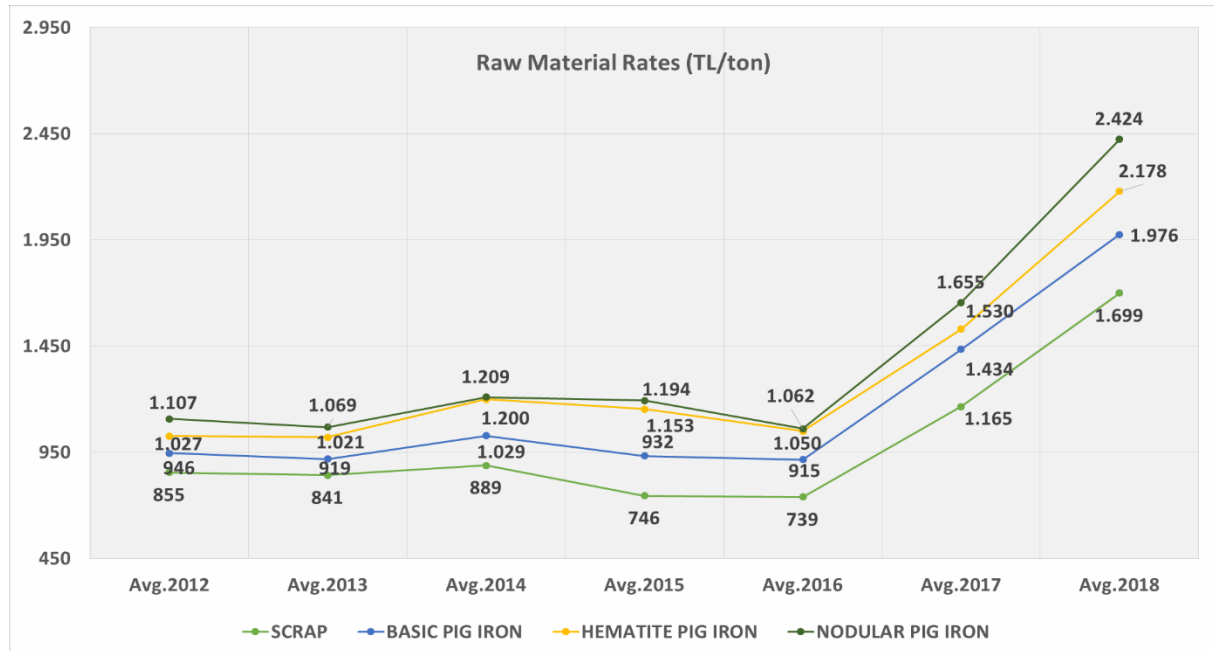
The energy cost of foundries was reported to increase by 53% in TLs and by 9% in Euros.

2. Raw Materials

The acceleration in the prices of the raw materials maintained in 2018. The average increase in prices reached around 130% in two years (Figure 5).

Foundries reported a 44% increase in TLs and a 3% increase in Euros in total raw materials costs.

Figure 5: RAW MATERIALS PRICE DEVELOPMENT



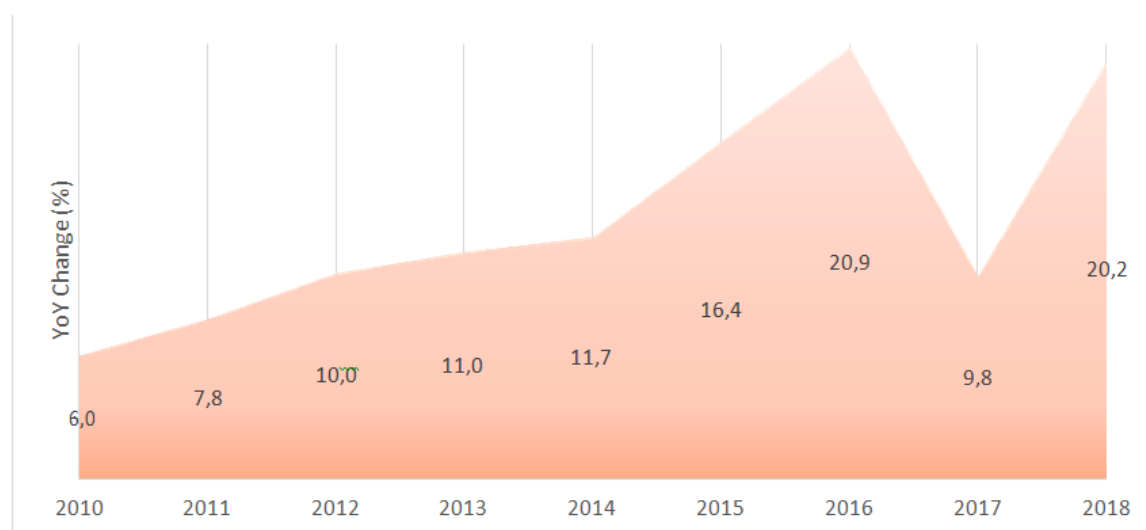
Source: TÜDÖKSAD - Turkish Foundry Association

3. Wages

The year-over-year change rate of the industrial production hourly labour cost index had dropped below the 10% level in 2017. But it accelerated again and increased by 20,2% in 2018 (Figure 6).

The 2-year collective agreement concluded between the employer and employee unions in the metal industry, effective as of Q3 2017 resulted in about a 30% increase in wages in 2018, including the inflation bonuses.

Figure 6: HOURLY LABOUR COST INDEX YEAR OVER YEAR CHANGE IN INDUSTRY



Source: Turkish Statistical Institute

Labour cost is the cost incurred by the employer in relation to employment as earnings and labour cost excluding earnings. Hourly labour cost is calculated by dividing the labour cost by the number of hours worked. The annual average of seasonally and calendar adjusted indices are used for calculation (2015=100).

Economy

UK gross domestic product increased by 1.4% between 2017 and 2018, which was slightly lower than the 1.8% growth seen between 2016 and 2017. Growth was at 0.2% in the three months to January 2019.

The services sector was the main driver of GDP growth while there was contraction in the production and construction sectors. The last three months of the year (to January 2018) saw falls in the manufacture of metal products, cars and construction, but there was an increase in monthly production and manufacturing output in December 2018, for the first time since mid-2018.

UK productivity also remained low compared with most of the G7 nations and business investment fell in every quarter of 2018. The UK's total trade deficit widened to £32B between 2017 and 2018, due mainly to an increase in services imports and falls in exports of cars, machinery and aircraft.

The annual inflation rate was running at over 2% throughout 2018 but fell in January to 1.8, and 1.9% in February and March. Consumer price inflation was at just over 2% at the end of 2018 and at 1.8% in March 2019.

In August the Bank of England raised its interest rate to 0.75%. Sterling has been relatively weak since the UK voted in the referendum to leave the EU and exchange rates have been low but not at the all-time low recorded in August 2017.

In terms of employment, at the end of 2018 the working age employment rate was at 76.2% for England (76.1% for the whole of the UK) and unemployment was around 3.9%. The percentage of workless working households for the UK was 14.5%. The number of vacancies in the UK has been increasing since 2012, and was at 852k at the end of 2018.

Net migration continued to add to the population of the UK as an estimated 283,000 more people moved to the UK with an intention to stay 12 months or more than left in the year ending September 2018. Over the year, 627,000 people moved to the UK (immigration) and 345,000 people left the UK (emigration).

Excluding bonuses, average weekly wages for Great Britain were estimated to have increased by 3.5% before adjusting for inflation and by 1.5% after adjusting for inflation.

Continued uncertainty related to the UK's decision to exit from the EU is expected to continue to affect confidence and investment levels in manufacturing.

Sources

Office for National Statistics, <https://www.ons.gov.uk/economy/>
MTA Economic Report for 2018, www.mta.org.uk/

Foundry Industry

For the UK foundry industry, 2018 was generally a positive year, with most foundry sectors seeing an increase in turnover and orders and most foundries being busy or very busy.

The non-ferrous sector was also strong although those companies supplying the automotive market suffered from a slowdown in the production and sales of passenger vehicles with some leading brands experiencing falling sales due to reduced demand from China and a move away from diesel cars. Some OEMs also had planned shutdowns at the end of March/beginning of April 2019 due to failing sales and concerns around the possibility of a no deal Brexit negatively affecting delivery schedules. The commercial vehicle market remained strong. One third of foundries who responded to the 2018 production survey reported capacity utilisation at less than 70% whilst 30% reported capacity at over 90%.

The ferrous sector saw increases in enquiries and orders with delivery times stretching out. The aerospace sector has improved with increases in orders, and the defence sector also remained strong. However, offshore oil and gas projects which saw some slow recovery during 2018, is now slowing once more.

The investment casting sector in particular remains strong with the UK being responsible for 50% of the market share for the EU.

UK foundries invested in new equipment and increased capabilities to improve their efficiency and competitiveness. 75% of those responding to information requests reported investment of some kind with many foundries investing in new furnaces, improved lighting, plant and automation and robotics as well as additive manufacturing technologies. Some investments were put on hold due to political uncertainty.

With regards to castings production in 2018 compared with 2017, the estimated output trends for each material were: -

Grey Iron –	increase of 5%
Ductile iron –	Increase of 12%
Steel –	Increase of 10%
Light Alloy –	Increase of 10%
Non Ferrous –	increase of 5%

Overall business costs had been increasing at around 9% during late 2017 and early 2018, but this decreased to around 3.5% for the last quarter of 2018, with the cost of some raw materials being stable. Prices of imported materials and fuels was the largest driver of input price growth. The results of surveys of wages and salaries was inconclusive but in general there were reports of some increase (of around 2 to 2.5%) between 2017 and 2018.

Comparing changes in the Producer Prices index, for light alloy castings the index fell by 2 points during the latter half of 2018, whilst for ferrous casting there was a steady increase throughout 2018 of some 6 index points.

Skills shortages and challenges with recruitment remains one of the main challenges for the UK industry and shortages in the availability of trained individuals and competition from other sectors remains of concern. Staff recruitment and skills was reported to be an issue of concern by 47 per cent of firms who responded to a recent industry census, carried out by the Cast Metals Federation, CMF, the Trade Association for the UK casting industry, with regulations/red tape reported by 28 per cent of firms and issues around taxation, VAT etc. reported by 21 per cent of firms. Finance, premises and pensions were issues for fewer than 1 in 10 firms.

To try to address the shortages in skilled employees, the UK castings industry has collaborated to develop a new qualification for apprentices and technicians, that can attract financial support through the Apprenticeship Levy on businesses that the UK government has introduced; this is a levy of 0.5% of pay bill on all companies with a pay bill over £3M per annum. This money can only be used to fund apprentice training through registered providers (and the company must still pay the apprentice a salary that meets the legal minimum wage requirements).

In addition, the UK industry has a new National Foundry Training Centre. Opened late in 2018, the facility is a fully-equipped foundry with moulding and melting facilities, pattern-shop, laboratories and classrooms and is now being used to train individuals of all abilities, including new recruits and apprentices. New training programmes are being written and business development activities are ongoing to deliver the training that the UK industry requires, through a new training company, Foundry Training Services Ltd, set up by the UK's professional members' organisation, ICME.

The UK industry, through the CMF, has also embarked upon a project to look at increasing the re-use of spent foundry sand and waste investment casting refractory shell either back into the sector or for use in other sectors, with the aim of reducing waste to landfill, as well as saving disposal costs to industry.

The UK also held its first conference for many years, CASTcon 2018, in April 2018, alongside an exhibition and social/networking events, and this was an opportunity for the industry, and its suppliers, to come together and hear about the latest developments in the industry.

OUTLOOK

The political uncertainty of the last 3 years, resulting from the UK's decision to exit the EU, has been a distraction and frustrating for businesses, but foundries continue to work as before. Some sectors have been affected more significantly, with EU customers stocking up during the first three months of 2019, and uncertainty for suppliers thereafter.

Almost 70% of those foundries responding to the 2018 CMF production survey expressed concern around the outlook into 2019, compared with only 17% who were anticipating some improvement or who were very positive about the future.

Government initiatives, towards greater recognition of the importance of a more balanced UK economy, through work on a UK Industrial Strategy, with the setting up of Catapult Centres (including a High Value Manufacturing Catapult) to provide greater links between academia and industry have, unfortunately, been side-lined to some degree.

The UK Governments' Industrial Strategy for the UK includes 4 Grand Challenges: Artificial Intelligence and Data, Ageing Society, Clean Growth and the Future of Mobility. These provide the focus for investment in innovation, alongside a desire to increase UK productivity. An 'Industrial Strategy Challenge Fund', established by government, aims to bring together the UK's leading research base with the best businesses to transform how citizens live, work and move around. The fund is being delivered by UK Research and Innovation but is at an early stage.

In addition, a £246M Faraday Battery Challenge has been established to invest in research and innovation projects and establish new facilities in battery production, use and recycling. Finally, the Foundation Industries Challenge Fund, covering glass, metals, cement, ceramics, chemicals and paper, aims to co-invest (with equivalent funding from industry) up to £66M to transform these foundation industries - to make them internationally competitive, secure more jobs and facilitate greater sector growth by 2025. These all offer opportunities for the industry but industry engagement and investment are required and it is recognised that it is hard for smaller companies, which make up the majority of the UK foundry industry, to resource engagement.

The Automotive sector saw reductions during 2018 and into the early part of 2019, with SMMT reporting that 'An eleventh successive month of decline in engine production for domestic vehicle assembly shows the underlying weakness of UK automotive manufacturing given the political instability and erosion of confidence.' Source: www.smmmt.co.uk/2019/04/british-engine-manufacturing-down-6-3-in-march-as-production-for-domestic-market-falters-in-q1/.

The SMMT sustainability report (www.smmmt.co.uk/reports/sustainability/) also states that 'Innovation is increasing at a faster pace than ever before. Manufacturers are delivering a range of electrified and alternatively fuelled vehicles, while simultaneously developing the technologies for connected and autonomous vehicles. The latest petrol and diesel engines deliver enhanced emissions performance, improving air quality solutions and lowering CO2.' This is likely to continue to have an effect on the foundry sector in the UK with changes in the volumes and design of parts being required.

For the aerospace sector, the outlook for the industry as a whole is generally positive, with recent growth in output expected to continue as demand for aircraft increases around the world.

The Oil and Gas sector was more positive during 2018, but there has been some reduction in confidence early in 2019 and slowing in orders.

However, the industry remains buoyant and there are some clear opportunities; UK labour laws and low inflation also mean that the UK is not necessarily now seen as a high cost country for manufacturing, and this has led to some reshoring. Plus there are some significant infrastructure projects such as High Speed Rail and plans for house building that could offer some opportunities to the sector.

TABLES

IRON, DUCTILE IRON AND STEEL CASTINGS

Table 1

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

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria	155,4	155,9	154,8	156,6	164,2	1,1	4,8
Belgium	76,5	71,6	51,5	42,9	85,2	-16,6	98,6
Bulgaria				49,8			
Croatia	43,5		42,9				
Czech Rep.	293,5 a)	289,0 a)	270,8 a)	295,0 a)	295,5 a)	8,9	0,2
Denmark	78,9	77,9	72,8	83,5	91,5	14,7	9,6
Finland	63,3	59,0	57,9	66,4	64,6	14,7	-2,7
France	1.393,6	1.328,5	1.263,7	1.330,9	1.339,9	5,3	0,7
Germany	4.150,9	4.120,4	3.919,0	4.184,9	4.256,2	6,8	1,7
Hungary	86,6	92,1	83,4	82,3	88,3	-1,4	7,3
Italy	1.164,0 b)	1.130,7 b)	1.152,4 b)	1.235,0 b)	1.253,1	7,2	1,5
Lithuania							
The Netherlands							
Norway	40,1	33,7	30,1	29,4	31,2	-2,2	5,8
Poland	700,0 a)	709,0 a)	696,0 a)	690,0 a)	690,0 a)	-0,9	0,0
Portugal	121,5	137,9	140,6	144,6	145,4	2,8	0,6
Slovenia	153,1		202,6	195,1	137,4	-3,7	-29,6
Spain	1.006,2	1.065,6	1.116,9	1.128,7	1.135,7	1,1	0,6
Sweden	231,6	261,2	230,3	236,7	248,6	2,8	5,0
Switzerland	45,1	38,1	59,1	60,4	61,0	2,2	1,0
Turkey	1.400,0	1.470,0	1.471,0	1.715,0	1.708,2	16,6	-0,4
United Kingdom	371,2	387,3	345,0	378,7	413,6	9,8	9,2
Total CAEF	11.574,9	11.428,0	11.360,8	12.105,9	12.209,8		
Belarus							
Bulgaria				49,9 c)			
Romania	44,8	40,8	32,3	30,5 c)			
Russia	3.738,0		3.200,0	3.500,0 c)			
Ukraine	1.130,0	1.130,0					

a) estimated

b) without investment castings

c) Source: Modern Casting 2017

Table 2

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

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria	479,7	390,8	395,3	408,6	427,3	3,4	4,6
Belgium					165,0		
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland	191,1	184,9	160,4	156,4	203,0	-2,5	29,8
France	2.871,0	2.584,0	2.710,0	2.767,0	2.862,0	2,1	3,4
Germany b)	7.224,8	6.985,3	6.631,8	7.151,7	7.510,5	7,8	5,0
Hungary	190,0	220,0	212,0	206,0	235,0	-2,8	14,1
Italy	2.560,0	2.540,0	2.447,0	2.608,5	2.055,4	6,6	-21,2
Lithuania							
The Netherlands							
Norway	141,0	76,0	56,8	65,8	36,0	15,8	-45,3
Poland							
Portugal	222,7	263,1	263,8	264,4	265,5	0,2	0,4
Slovenia							
Spain	1.832,0	1.862,0	1.884,0	1.922,0	1.949,0	2,0	1,4
Sweden							
Switzerland							
Turkey	2.010,0	1.985,5	1.961,3	2.410,2	2.486,6	22,9	3,2
United Kingdom			1.770,0 c)	1.800,0 c)	1.944,0 c)	1,7	8,0
Total							

a) rate of exchange: Ø 2018 or fixed

b) foundries >50 employees, turnover

c) using exchange rate 1£ -1.18€

Table 3

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

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria	28	27	23	23	15	0,0	-34,8
Belgium	16	16	15	15	13	0,0	-13,3
Bulgaria				80			
Croatia	32		32				
Czech Rep.	81	90	71	71	71	0,0	0,0
Denmark	8	8	8	8	8	0,0	0,0
Finland	19	19	18	18	16	0,0	-11,1
France	124	121	120				
Germany	254	248	243	240	239	-1,2	-0,4
Hungary	35	35	35	34	29	-2,9	-14,7
Italy	174 a)	174 a)	189 b(c)	191 b(c)	185 b(c)	1,1	-3,1
Lithuania							
The Netherlands							
Norway	9	8	9	7	5	-22,2	-28,6
Poland	216	216	216	215	215	-0,5	0,0
Portugal	37	31	31	31	31	0,0	0,0
Slovenia	15		11	57	13		
Spain	76	75	74	75	75	1,4	0,0
Sweden		40	39	38	38	-2,6	0,0
Switzerland		15	17	17	17	0,0	0,0
Turkey	561	550	544	546	546	0,4	0,0
United Kingdom	219	217	216	212	210	-1,9	-0,9
Total	1.904	1.890	1.911	1.878	1.726		

a) without 17 companies active in investment casting

b) including investment casting

c) revised data, employment statistics register

Table 4

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

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria	3.222	3.200	2.905	2.971	2.257	2,3	-24,0
Belgium	1.147 b)	1.066 b)	1.066 b)	1.193	1.757	11,9	47,3
Bulgaria				4.382			
Croatia	2.216						
Czech Rep.	18.000 d)	10.000 d)	11.000	11.000	11.000	0,0	0,0
Denmark	1.205		914	1.095	1.079	19,8	-1,5
Finland	1.428	1.354	1.242	1.318	1.363	6,1	3,4
France	14.671	13.994	13.300				
Germany a)	44.584	43.969	41.844	41.774	42.019	-0,2	0,6
Hungary	1.460	2.170	1.980	1.920	3.850	-3,0	100,5
Italy	13.603 c)	13.548 c)	14.047 e(g)	9.182 e(g)	9.248	-34,6	0,7
Lithuania							
The Netherlands							
Norway	935	783	850	640		-24,7	
Poland		16.200	16.000	16.000	16.000	0,0	0,0
Portugal	2.133	2.198	2.381	2.640	2.444	10,9	-7,4
Slovenia	1.746		1.400	1.418	1.135	1,3	-20,0
Spain	10.405	10.501	10.980	11.070	10.928	0,8	-1,3
Sweden			4.746				
Switzerland		1.198	1.116	1.070	1.058	-4,1	-1,1
Turkey	23.150	22.630	20.020	20.500	20.100	2,4	-2,0
United Kingdom	9.100	9.100	15.000 f)	14.500 f)	14.600	-3,3	0,7
Total	149.005	151.911	160.791	142.673	138.838		

a) foundries >50 employees

b) only workmen

c) without investment casting

e) including investment casting

g) revised data, employment statistics register

d) incl. non-ferrous

f) new survey, more accurate figures!

Table 5

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

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria							
Belgium							
Bulgaria							
Croatia							
Czech Rep.	108,5	190,0					
Denmark							
Finland	21,9	20,0	23,8	25,3	21,4	6,6	-15,3
France	647,1	620,8	471,4	451,3	433,2	-4,3	-4,0
Germany	1.645,4	1.621,9	1.525,7	1.630,6	1.669,8	6,9	2,4
Hungary	65,8	72,7	53,8	58,0	53,2	7,7	-8,2
Italy	391,2	406,4	488,0 a)	473,7 a)	520,9	-2,9	10,0
Lithuania							
The Netherlands							
Norway	14,7	13,9	16,8	14,8	16,1	-11,8	8,8
Poland	317,6	323,7	313,6	311,9	311,9	-0,5	0,0
Portugal	101,9	125,0	121,4	136,7	137,0	12,6	0,3
Slovenia							
Spain	575,7	638,2	681,1	704,0	746,8	3,4	6,1
Sweden			47,7				
Switzerland							
Turkey	756,5	842,5	813,5	961,5	1024,25	18,2	6,5
United Kingdom							
Total	4.646,4	4.875,0	4.556,8	4.767,7	4.934,7		

a) revised

IRON CASTINGS

Table 6

Total production in 1000 t - Iron castings

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria	40,7	40,6	42,4	42,9	43,0	1,3	0,2
Belgium	34,3	28,7	26,9	26,9	69,9	-0,1	160,3
Bulgaria				30,3	29,9		-1,1
Croatia	33,4		31,1				
Czech Rep.	160,0 a)	170,0 a)	158,0	176,0	176,5	11,4	0,3
Denmark	30,8	30,8	20,4	27,5	29,6	34,9	7,8
Finland	17,2	14,5	15,3	19,5	18,4	27,9	-5,8
France	566,2 b)	504,4 b)	531,5	574,1	597,4	8,0	4,0
Germany	2.381,1	2.369,7	2.234,9	2.421,4	2.435,6	8,3	0,6
Hungary	25,7	23,4	21,7	24,6	22,0	13,1	-10,5
Italy	702,9	694,1	714,2	755,8	767,6	5,8	1,6
Lithuania							
The Netherlands							
Norway	11,8	11,3	10,9	8,3	8,8	-23,5	6,4
Poland	489,0 a)	485,3 a)	484,0 a)	480,0	480,0	-0,8	0,0
Portugal	33,5	39,8	39,4	41,5	43,4	5,2	4,6
Slovenia	80,5		139,7	195,1	106,5	39,7	-45,4
Spain	334,7	348,2	379,9	365,7	357,6	-3,7	-2,2
Sweden	212,0	242,0	159,6	159,4	161,7	-0,2	1,5
Switzerland	14,9	12,2	35,4	36,5	36,7	3,0	0,6
Turkey	650,0	675,0	650,0	720,0	603,0	10,8	-16,3
United Kingdom	133,1	139,8	125,8	138,0	144,9	9,7	5,0
Total	5.910,9	5.789,2	5.778,7	6.200,5	6.132,6		

a) estimation

b) incl. malleable castings

Table 7

Production value in Mio. € (a) - Iron castings

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria							
Belgium							
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland	31,9	27,9	28,7	35,4	37,7	23,4	6,6
France							
Germany b,c)	5.982,2	5.785,8	5.541,2	6.048,9	6.370,0	9,2	5,3
Hungary							
Italy							
Lithuania							
The Netherlands							
Norway	48,0	13,0	10,2	10,3	11,0	1,0	6,8
Poland							
Portugal	51,7	61,9	57,6	66,3	73,6	15,2	11,0
Slovenia							
Spain b)	1.427,0	1.495,0	1.539,0	1.583,0	1.622,0	2,9	2,5
Sweden							
Switzerland							
Turkey	720,0	722,0	675,0	745,2	607,3	10,4	-18,5
United Kingdom							
Total							

a) rate of exchange: Ø 2018 or fixed

b) incl. nodular and malleable iron castings

c) foundries >50 empl., turnover

Table 8

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

Country	Year	1	2	3	4	5	6 7		8	Total iron castings
		Pressure pipes and fittings	Drain pipes and fittings	Building and domestic goods	Ingot moulds and bottoms	Rolls	Iron castings for		Any other iron castings	
							Eng. plant and machinery	Vehicle industry		
Austria	2017									42,9
	2018									43,0
	± %									0,2
Belgium	2017									26,9
	2018									69,9
	± %									160,3
Bulgaria	2017									30,3
	2018									
	± %									
Croatia	2017									
	2018									
	± %									
Czech Rep.	2017									176,0
	2018									176,5
	± %									0,3
Denmark	2017									27,5
	2018									29,6
	± %									7,8
Finland	2017		7,1			3,9	7,0	1,6	7,123	19,5
	2018		5,2			4,8	4,7	3,3	0,463	18,4
	± %					24,8	-33,5	107,7	-93,5	-5,9
France	2017									574,1
	2018									597,4
	± %									4,0
Germany	2017	a)	a)	a)	a)	a)	530,2	1.658,9	232,3	2.421,4
	2018						517,6	1.656,2	261,9	2.435,6
	± %						-2,4	-0,2	12,7	0,6
Hungary	2017					2,5	21,6		0,5	24,6
	2018									22,0
	± %									-10,5
Italy	2017	b)	b)	38,2	14,0		352,6	253,2	97,7	755,8
	2018	b)	b)	37,5		15,0	359,2	257,2	98,7	767,6
	± %			-1,8			1,9	1,6	1,0	1,6
Lithuania	2017									
	2018									
	± %									
The Netherlands	2017									
	2018									
	± %									
Norway	2017		1,7	6,5			0,1		1,6	8,3
	2018			6,5			0,3		2,1	8,8
	± %			-0,3			101,4		28,0	6,9
Poland	2017									480,0
	2018									480,0
	± %									0,0
Portugal	2017		0,8	1,6			1,8	34,8	2,5	41,5
	2018		1,3	1,7			1,3	36,2	2,9	43,4
	± %		56,7	7,1			-24,8	4,0	14,6	4,6
Slovenia	2017									195,1
	2018									106,5
	± %									-45,4
Spain	2017									365,7
	2018									357,6
	± %									-2,2
Sweden	2017									159,4
	2018									161,7
	± %									1,5
Switzerland	2017									36,5
	2018									36,7
	± %									0,6
Turkey	2017	13,0	12,0	100,0	30,0	20,0	230,0	260,0	55,0	720,0
	2018	10,0	10,0	65,0	20,0	15,0	210,0	233,0	40,0	603,0
	± %	-23,1	-16,7	-35,0	-33,3	-25,0	-8,7	-10,4	-27,3	-16,3
United Kingdom	2017									138,0
	2018									144,9
	± %									5,0

a) contained in: Pos. 8

b) contained in: Pos. 3

Table 9

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

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria	24	23	20	20	12	0,0	-40,0
Belgium	11	11	10		5		
Bulgaria							
Croatia	26		26				
Czech Rep.		63	71		56		
Denmark	8	8	8	8		0,0	
Finland	12	12	11	11	11	0,0	0,0
France	88	86	86				
Germany a)	154	149	148	151	150	2,0	-0,7
Hungary	16	16	28	27		-3,6	
Italy	149	149	140	139 b)	147 b)	-0,7	5,8
Lithuania							
The Netherlands							
Norway	6	5	6	5	5	-16,7	0,0
Poland	180	180	185	180	180	-2,7	0,0
Portugal	30	23	23	23	23	0,0	0,0
Slovenia	11						
Spain	46	45	45	46	46	2,2	0,0
Sweden		30	27	26	26	-3,7	0,0
Switzerland		14	15	15	15	0,0	0,0
Turkey	490	481	439	441	441	0,5	0,0
United Kingdom							
Total	1.251	1.295	1.288	1.092	1.117		

a) adjusted data, foundries >50 employees, end of the year

b) ISTAT

Table 10

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

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria							
Belgium	612 b)	570 b)	570 b)				
Bulgaria							
Croatia	1.820		2.125				
Czech Rep.			7.000				
Denmark	1.205		914	1.095			
Finland	847	778	768	741	800	-3,5	8,0
France	11.231	10.894	10.370				
Germany a)	36.975	36.530	35.170	35.006	35.398	-0,5	1,1
Hungary							
Italy	11.013	10.969	6.984 c)	6.869 c)	6.990	-1,6	1,8
Lithuania							
The Netherlands							
Norway	774	660	743	640		-13,9	
Poland		12.600	12.500	12.500	12.500		
Portugal	1.584	1.584	1.762	1.815	1.848	3,0	1,8
Slovenia	1.306						
Spain	8.062	8.176	8.585	8.752	8.600	1,9	-1,7
Sweden			3.477				
Switzerland			984		951		
Turkey	16.000	16.000	13.520	14.000	13.600	3,6	-2,9
United Kingdom							
Total	91.429	98.761	105.472	81.418	80.687		

a) foundries >50 employees, end of the year

b) only workers

c) ISTAT

Table 11

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

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/-	%
Austria							
Belgium							
Bulgaria							
Croatia	28,5						
Czech Rep.							
Denmark							
Finland	20,7	18,1	22,6	23,8	18,5	5,3	-22,4
France	619,4 a)	602,8 a)	450,8 a)	432,4	409,4	-4,1	-5,3
Germany	1.562,1 a)	1.544,4 a)	1.450,5 a)	1.551,4 a)	1.589,0 a)	7,0	2,4
Hungary		71,1	51,7	55,9		8,1	
Italy							
Lithuania							
The Netherlands							
Norway	13,9	13,5	16,8	14,8	16,1	-11,8	8,8
Poland	300,0	307,6	297,0	295,9	295,0	-0,4	-0,3
Portugal	96,3	118,0	115,7	132,5	133,3	14,5	0,6
Slovenia							
Spain	514,7 a)	548,2 a)	631,7 a)	655,2	696,4	3,7	6,3
Sweden			46,9				
Switzerland							
Turkey	650	750	680	833,5	875,75	22,6	5,1
United Kingdom							
Total	3.805,6	3.973,7	3.763,8	3.995,5	4.033,5		

a) incl. malleable iron castings

DUCTILE IRON CASTINGS

Table 12

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

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria	97,7	95,5	101,8	102,9	109,7	1,1	6,6
Belgium	6,7	6,9	7,2	8,4	7,8	16,8	-6,2
Bulgaria				9,2			
Croatia	10,0		11,8				
Czech Rep.	58,5	59,0	51,8	55,0	57,0	6,2	3,6
Denmark	48,1	47,1	52,5	56,1	61,9	6,9	10,4
Finland	33,1	32,1	33,5	36,3	36,2	8,1	-0,2
France	745,2	761,2	675,2	696,3	682,1	3,1	-2,0
Germany	1.563,6	1.560,1	1.509,9	1.587,7	1.636,0	5,2	3,0
Hungary	48,8	63,0	57,9	54,5	63,4	-5,8	16,3
Italy	389,9	374,6	381,2	425,1	428,6	11,5	0,8
Lithuania							
The Netherlands							
Norway	25,9	21,2	19,2	21,1	22,3	9,9	5,6
Poland	156,0	173,9	166,2	160,0	160,0	-3,7	0,0
Portugal	80,7	90,0	93,4	97,2	96,8	4,1	-0,5
Slovenia	34,2		31,0	38,6	46,6	24,5	20,9
Spain	583,5	644,8	671,4	698,1	711,6	4,0	1,9
Sweden			49,5	55,6	64,0	12,3	15,2
Switzerland	28,6	24,7	22,8	22,8	22,1	0,0	-3,1
Turkey	610,0	645,0	655,0	825,0	912,9	26,0	10,7
United Kingdom	190,1	199,6	178,5	196,0	219,5	9,8	12,0
Total	4.710,7	4.798,6	4.769,6	5.145,9	5.338,5		

Table 13

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

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria							
Belgium							
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland	73,9	71,4	70,1	54,7	89,2	-21,9	63,1
France							
Germany	b)	b)	b)	b)	b)		
Hungary							
Italy					1.602,6		
Lithuania							
The Netherlands							
Norway	68,0	53,0	46,6	55,5	25,0	19,1	-55,0
Poland							
Portugal	120,9	147,6	152,3	155,4	150,4	2,0	-3,2
Slovenia							
Spain	b)	b)	b)	b)	b)		
Sweden							
Switzerland							
Turkey	850,0	860,0	885,0	1.155,0	1.304,5	30,5	12,9
United Kingdom							
Total							

a) rate of exchange: Ø 2018 or fixed

b) 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	2	3	4	Total nodular iron castings			
		Pressure pipes and fittings	Nodular iron castings for:		Any other nodular iron castings				
			Eng. plant and machinery	Vehicle industry					
Austria	2017					102,9			
	2018					109,7			
	± %					6,6			
Belgium	2017					8,4			
	2018					7,8			
	± %					-6,2			
Bulgaria	2017					9,2			
	2018								
	± %								
Croatia	2017					11,8			
	2018								
	± %								
Czech Rep.	2017					55,0			
	2018					57,0			
	± %					3,6			
Denmark	2017					56,1			
	2018					61,9			
	± %					10,4			
Finland	2017		20,7	12,1	3,44	36,3			
	2018		20,4	13,7	2,04	36,2			
	± %		-1,4	13,2	-40,8	-0,2			
France	2017					696,3			
	2018					682,1			
	± %					-2,0			
Germany	2017	a)	518,6	666,2	403,0	1.587,7			
	2018	a)	538,6	661,7	435,7	1.636,0			
	± %		3,9	-0,7	8,1	3,0			
Hungary	2017		21,3	33,2		54,5			
	2018					63,4			
	± %					16,3			
Italy	2017	52,3 b)	224,8	128,2	19,7	425,1			
	2018	49,8	229,2	131,1	18,5	428,6			
	± %	-4,9	2,0	2,2	-6,0	0,8			
Lithuania	2017								
	2018								
	± %								
The Netherlands	2017								
	2018								
	± %								
Norway	2017		1,9		19,3	21,1			
	2018		2,2		20,1	22,3			
	± %		18,5		4,3	5,6			
Poland	2017					160,0			
	2018								160,0
	± %								0,0
Portugal	2017	5,7	1,9	87,6	2,1	97,2			
	2018	6,0	0,9	87,6	2,2	96,8			
	± %	4,8	-49,8	0,1	5,6	-0,5			
Slovenia	2017					38,6			
	2018					46,6			
	± %					20,9			
Spain	2017					698,1			
	2018					711,6			
	± %					1,9			
Sweden	2017					55,6			
	2018					64,0			
	± %					15,2			
Switzerland	2017					22,8			
	2018					22,1			
	± %					-3,1			
Turkey	2017	120,5	233,0	387,0	84,5	825,0			
	2018	123,0	263,4	412,0	114,5	912,9			
	± %	2,1	13,0	6,5	35,5	10,7			
United Kingdom	2017					196,0			
	2018					219,5			
	± %					12,0			

a) contained in: Pos. 4

b) total building industry

STEEL CASTINGS

Table 15

Total production in 1000 t - Steel castings

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria	16,9	9,5	11,3	10,8	11,4	-4,6	6,3
Belgium	35,5	36,0	17,4	7,3	7,5	-57,8	1,6
Bulgaria				10,4			
Croatia	0,1		0,05				
Czech Rep.	75,0	60,0	61,0	64,0	62,0	4,9	-3,1
Denmark							
Finland	13,0	12,5	8,4	6,2	10,1	-26,5	63,1
France	82,3	62,8	57,0	60,4	60,4	5,8	0,1
Germany	206,3	190,6	174,2	175,8	184,7	0,9	5,1
Hungary	12,1	5,7	3,8	3,1	2,8	-17,0	-10,0
Italy	71,2	62,0	57,0	54,1	56,9	-5,0	5,1
Lithuania							
The Netherlands							
Norway	2,4	1,2					
Poland	55,0 a)	49,9 a)	50,5 a)	50,0	50,0	-1,0	0,0
Portugal	7,3	8,1	7,8	5,9	5,3	-24,5	-10,2
Slovenia	38,4		32,0	30,2	2,1	-5,5	-92,9
Spain	82,4	72,6	65,6	64,9	66,6	-1,1	2,6
Sweden	19,6	19,2	21,2	21,75	22,9	2,5	5,3
Switzerland	1,7	1,2	1,1	1,1	2,3	6,3	99,1
Turkey	140,0	150,0	166,0	170,0	192,4	2,4	13,2
United Kingdom	48,0	48,0	40,7	44,7	49,2	9,8	10,0
Total	907,0	789,3	775,0	780,6	786,5		

a) estimated

Table 16

Production value in Mio. € (a) - Steel castings

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria							
Belgium							
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland	85,3	85,5	60,7	66,3	76,1	9,3	14,8
France							
Germany b)	1.242,6	1.199,4	1.090,6	1.102,8	1.140,5	1,1	3,4
Hungary							
Italy					452,8		
Lithuania							
The Netherlands							
Norway	25,0	10,0					
Poland							
Portugal	50,1	53,5	54,0	42,7	41,6	-20,8	-2,7
Slovenia							
Spain	405,0	367,0	345,0	339,0	327,0	-1,7	-3,5
Sweden							
Switzerland							
Turkey	400,0	345,0	401,3	510,0	574,8	27,1	12,7
United Kingdom							
Total							

a) rate of exchange: Ø 2018 or fixed

b) foundries >50 employees, turnover

Table 17

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

Country	Year	1	2	3	4	Total steel castings
		Steel castings castings for:		Steel castings for railways, locomotives, carriages, wagons and trams	Any other steel castings	
		Eng. plant and machinery	Vehicle industry			
Austria	2017					10,8
	2018					11,4
	± %					6,3
Belgium	2017					7,3
	2018					7,5
	± %					1,6
Bulgaria	2017					10,4
	2018					
	± %					
Croatia	2017					0,05
	2018					
	± %					
Czech Rep.	2017					64,0
	2018					62,0
	± %					-3,1
Denmark	2017					
	2018					
	± %					
Finland	2017	3,9	0,501	0,057	6,2	10,6
	2018	9,0	0,001	0,013	1,0	10,1
	± %	132,1	-99,8	-77,2	-83,3	-5,2
France	2017					60,4
	2018					60,4
	± %					0,1
Germany	2017	43,3	12,7		119,8	175,8
	2018	47,7	13,3		123,7	184,7
	± %	10,0	5,2		3,3	5,1
Hungary	2017		0,3	2,7	0,1	3,1
	2018					2,8
	± %					-10,0
Italy	2017	7,8	2,9	1,2	42,2 a)	54,1
	2018	8,6	3,3	1,3	43,6 a)	56,9
	± %	11,0	15,1	9,5	3,2	5,1
Lithuania	2017					
	2018					
	± %					
The Netherlands	2017					
	2018					
	± %					
Norway	2017					
	2018					
	± %					
Poland	2017					50,0
	2018					50,0
	± %					0,0
Portugal	2017	2,1	0,3	0,3	3,1	5,9
	2018	2,6	0,3	0,2	2,2	5,3
	± %	22,3	-4,5	-54,7	-28,3	-10,2
Slovenia	2017					30,2
	2018					2,1
	± %					-92,9
Spain	2017					64,9
	2018					66,6
	± %					2,6
Sweden	2017					21,8
	2018					22,9
	± %					5,3
Switzerland	2017					1,1
	2018					2,3
	± %					99,1
Turkey	2017	67,0	19,0	21,0	63,0	170,0
	2018	70,4	21,0	26,0	75,0	192,4
	± %	5,0	10,5	23,8	19,0	13,2
United Kingdom	2017					44,7
	2018					49,2
	± %					10,0

a) incl. mining industry, building and domestic goods and steel industry

Table 18

Number of foundries (Production units) - Steel castings

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria	4	4	3	3	3	0,0	0,0
Belgium	5	5	5		8		
Bulgaria							
Croatia	5		5				
Czech Rep.		27			28		
Denmark							
Finland	7	7	7	7	7	0,0	0,0
France	36	35	34				
Germany a)	47	46	42	41	40	-2,4	-2,4
Hungary	11	11	9	7		-22,2	
Italy	25	25	37 b)	37 b)	38 c)	0,0	2,7
Lithuania							
The Netherlands							
Norway	3	3	3				
Poland	36	36	36	35	35	-2,8	0,0
Portugal	7	8	8	8	8	0,0	0,0
Slovenia	3				5		
Spain	30	30	29	29	29	0,0	0,0
Sweden		10	12	12	12	0,0	0,0
Switzerland		2	2	2	2	0,0	0,0
Turkey	68	66	105	105	105	0,0	0,0
United Kingdom							
Total	287	315	337	286	320		

a) adjusted data, foundries >50 empl.

b) ISTAT

c) incl. Investment casting foundries

Table 19

Number of persons employed total - Steel castings

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria							
Belgium	535		496				
Bulgaria							
Croatia	168		168				
Czech Rep.							
Denmark							
Finland	581	576	474	577	563	21,7	-2,4
France	3.440	3.100	3.050				
Germany a)	7.609	7.439	6.674	6.768	6.621	1,4	-2,2
Hungary							
Italy	2.590	2.580	2.369 b)	2.313 b)	2.258	-2,4	-2,4
Lithuania							
The Netherlands							
Norway	161	123	107				
Poland		3.600	3.500	3.500	3.500	0,0	0,0
Portugal	549	614	619	825	596	33,3	-27,8
Slovenia	440				352		
Spain	2.343	2.325	2.395	2.318	2.328	-3,2	0,4
Sweden			1.269				
Switzerland			132	130	107	-1,5	-17,7
Turkey	7.000	6.500	6.500	6.500	6.500	0,0	0,0
United Kingdom							
Total	25.416	26.857	27.753	22.931	22.825		

a) foundries >50 empl.

b) ISTAT

Table 20

Direct exports total in 1000 t - Steel castings

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria							
Belgium							
Croatia	0,05						
Czech Rep.							
Denmark							
Finland	1,2	1,8	1,1	1,5	2,9	32,8	100,2
France	27,7	18,0	20,6	19,0	23,8	-7,7	25,5
Germany	83,3	77,5	75,2	79,1	80,8	5,3	2,1
Hungary		1,6	2,1	2,1		-2,8	
Italy							
Lithuania							
The Netherlands							
Norway	0,8	0,4					
Poland	16,5	15,0	15,7	16,0	16,0	1,9	0,0
Portugal	5,6	7,0	5,7	4,1	3,7	-27,5	-9,5
Slovenia							
Spain	61,1	54,0	49,4	48,8	50,4	-1,2	3,2
Sweden			0,9				
Switzerland							
Turkey	100	115	125,5	128	140,5	2,0	9,8
United Kingdom							
Total	296,2	290,3	296,1	298,5	318,1		

NON-FERROUS METAL CASTINGS

Table 21

Total production in 1000 t - Non-ferrous metal castings

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria	138,0	140,7	147,1	148,3	163,4	0,8	10,2
Belgium	1,9	2,2	0,8		2,2		
Bulgaria							
Croatia	22,3		24,8				
Czech Rep.	108,0 a)	116,0 a)	119,0 a)	122,0 a)	124,2 a)	2,5	1,8
Denmark	4,0	4,3	3,9	4,4	4,0	13,2	-9,8
Finland	7,1	8,0	4,8	5,9	5,5	22,0	-6,3
France	335,8	356,9	362,2	367,3	441,3	1,4	20,2
Germany	1.134,2 c)	1.221,3	1.248,8	1.206,1	1.176,7	-3,4	-2,4
Hungary	108,2	112,4	123,3	127,7	139,2	3,6	9,0
Italy	860,9	900,5	934,0	1.000,1	1.008,1	7,1	0,8
Lithuania							
The Netherlands							
Norway	6,6 b)	7,2 b)	6,4 b)	5,9 b)	6,5 b)	-7,7	10,9
Poland	358,0 a)	353,0 a)	348,8 a)	346,5 a)	346,5 a)	-0,7	0,0
Portugal	34,9	45,4	50,5	54,1	56,5	7,0	4,6
Slovenia	44,9		52,1	52,1	70,6	0,0	35,6
Spain	135,6	146,0	163,5	166,7	153,1	2,0	-8,2
Sweden	58,2	62,6	61,5	63,7	67,3	3,6	5,6
Switzerland	20,4	18,1	16,2	15,4	17,0	-5,0	10,4
Turkey	300,0	380,0	427,5	440,0	547,0	2,9	24,3
United Kingdom	131,0	131,0	141,7	152,1	166,3	7,3	9,4
Total CAEF	3.809,9	4.005,6	4.236,8	4.278,2	4.495,4		
Belarus							
Bulgaria				5,9 d)			
Romania	63,5	88,2	90,9	82,3 d)			
Russia	462,0		700,0	725,0 d)			
Ukraine	430,0	430,0					

a) estimated

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

c) revised figures

d) Source: Modern Casting 2017

Table 22

Production value in Mio. € (a) - Non-ferrous metal castings

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria	938,2	991,3	997,5	1.079,9	1.123,4	8,3	4,0
Belgium							
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland	76,4	60,8	55,9	62,5	62,1	11,8	-0,6
France	2.706,0	2.805,0	2.707,0	2.876,0	2.727,0	6,2	-5,2
Germany c)	5.488,9	5.743,5	5.764,9	5.962,5	6.067,6	3,4	1,8
Hungary	304,0	370,0	387,0	396,0	395,0	2,3	-0,3
Italy	4.160,0	4.460,0	4.431,0	4.856,4	4.178,7	9,6	-14,0
Lithuania							
The Netherlands							
Norway	43,0 b)	63,0 b)	61,0 b)	58,0 b)	51,0 b)	-4,9	-12,1
Poland							
Portugal	243,7	291,5	317,1	325,8	334,9	2,7	2,8
Slovenia							
Spain	763,0	853,0	896,0	960,0	951,0	7,1	-0,9
Sweden							
Switzerland							
Turkey	1.575,0	1.730,0	1.995,0	2.060,0	2.628,7	3,3	27,6
United Kingdom			826,0 d)	1.100,0 d)	1.100,0 d)	33,2	0,0
Total							

a) rate of exchange: Ø 2018 or fixed

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

c) foundries >50 employees, turnover

d) using exchange rate 1£ -1.18€

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	
	2017	2018	2017	2018	2017	2018	2017	2018
Austria	33	23						
Belgium	6	6						
Bulgaria	18							
Croatia								
Czech Rep.	37	37						
Denmark	7	7						
Finland	14	14		5		5		4
France								
Germany	337	337						
Hungary	86	31		19		9		3
Italy	862 a)	859 a)						
Lithuania								
The Netherlands								
Norway	6	3				3		
Poland	240	240						
Portugal a)	57	57		28		12		17
Slovenia	45	46						
Spain	52	51						
Sweden	61	61		35		26		
Switzerland	39	40		10		26		4
Turkey	386	390		295		59		36
United Kingdom	204	203						
Total	2.490	2.405						

a) ISTAT

Table 24

Employment in the foundry industry - Non-ferrous metal castings

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria	4.159	3.399	3.923	4.127	5.029	5,2	21,9
Belgium	258	262	262	266	496	1,5	86,5
Bulgaria				280			
Croatia	1.545						
Czech Rep.		6.000	4.000	4.000	4.000	0,0	0,0
Denmark			408				
Finland	447	376	330	413	413	25,2	0,0
France	11.900	11.800	12.000				
Germany a)	34.201	34.897	35.229	35.967	36.845	2,1	2,4
Hungary	4.870	5.190	5.490	6.076	5.650	10,7	-7,0
Italy	14.428	15.092	15.100	18.836 b)	18.312 b)	24,7	-2,8
Lithuania							
The Netherlands							
Norway	423	447	452	296	287	-34,5	-3,0
Poland		8.000	8.300	8.300	8.300	0,0	0,0
Portugal	1.724	2.356	2.399	3.400	3.461	41,7	1,8
Slovenia	2.243		2.500	4.195	4.138	67,8	-1,4
Spain	4.810	4.862	5.027	5.275	5.321	4,9	0,9
Sweden			3.157				
Switzerland		1.239	1.297	1.274	1.504	-1,8	18,1
Turkey	10.000	10.000	14.000	13.500	13.750	-3,6	1,9
United Kingdom	8.900	8.900	14.000 c)	13.000	13.650	-7,1	5,0
Total	99.908	112.820	127.874	119.205	121.156		

a) foundries > 50 empl.

b) ISTAT

c) new survey, more accurate figures!

COPPER ALLOY CASTINGS

Table 25

Total production in t - Copper alloy castings

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria							
Belgium							
Bulgaria				292			
Croatia	183		221				
Czech Rep.	18.000 ac)	21.000 ac)	20.000 ac)	20.000 a)	20.500 a)	0,0	2,5
Denmark	1.099	1.055	779	1.292	1.285	65,9	-0,5
Finland	3.953	3.903	2.630	3.247	3.031	23,5	-6,7
France	17.864	18.344	17.724	17.877	19.307	0,9	8,0
Germany	72.064	79.403	78.471	79.192	79.278	0,9	0,1
Hungary	2.175	1.796	1.681	1.799	705	7,0	-60,8
Italy	65.855	63.752	66.081	71.007	69.729	7,5	-1,8
Lithuania							
The Netherlands							
Norway	b)	b)	b)	b)	b)		
Poland	6.000 a)	6.950 a)	6.100 a)	6.100 a)	6.100 a)	0,0	0,0
Portugal	10.464	14.152	15.967	16.800	16.496	5,2	-1,8
Slovenia	754		947	842	755	-11,1	-10,3
Spain	10.176	10.876	15.098	15.096	14.400	0,0	-4,6
Sweden			6.934	8.312	8.792	19,9	5,8
Switzerland	2.090	2.068	2.308	2.021	2.086	-12,4	3,2
Turkey	19.000	20.000	22.500	25.000	30.709	11,1	22,8
United Kingdom	8.832	8.832	8.500	8.500	8.670	0,0	2,0
Total	238.509	252.131	265.941	277.377	281.843		

a) estimated

b) only 2 foundries = no data collection

c) copper and zinc

Table 26

Production value in Mio. € (a) - Copper alloy castings

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria							
Belgium							
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland	41,4	30,7	27,2	35,4	27,5	30,2	-22,2
France							
Germany	795,1 b)	869,3 b)	863,7 b)	871,0 b)	891,5 b)	0,9	2,3
Hungary							
Italy							
Lithuania							
The Netherlands							
Norway							
Poland							
Portugal	102,2	107,7	114,7	115,2	105,5	0,4	-8,4
Slovenia							
Spain							
Sweden							
Switzerland							
Turkey	150,0	150,0	170,0	187,0	246,5	10,0	31,8
United Kingdom							
Total							

a) rate of exchange: Ø 2018 or fixed

b) copper and zinc, revised figures: foundries >50 employees, turnover

Table 27

Copper alloy castings in t

Country	Year	Total Production	thereof:							general engineering	automotive industry	other
			Sandcast and Gravity die castings	thereof:				Pressure die casting				
				Copper	Aluminium Bronze	other Bronzes	Brass	Messing Laiton Brass				
Austria	2017											
	2018											
	± %											
Belgium	2017											
	2018											
	± %											
Bulgaria	2017	291,9										
	2018											
	± %											
Croatia	2017	221,0										
	2018											
	± %											
Czech Rep.	2017	20.000										
	2018	20.500										
	± %	2,5										
Denmark	2017	1.292										
	2018	1.285										
	± %	-0,5										
Finland	2017	3.247		3.247	1.053	1.209	985		3.247			
	2018	3.031			674	1.504	905		3.031			
	± %	-6,7			-36,0	24,4	-8,1		-6,7			
France	2017	17.877										
	2018	19.307										
	± %	8,0										
Germany	2017	79.192	39.026						150	27	79.015	
	2018	79.278	37.615						287	29	78.962	
	± %	0,1	-3,6						91,3	7,4	-0,1	
Hungary	2017	1.799										
	2018	705										
	± %	-60,8										
Italy	2017	71.007										
	2018	69.729										
	± %	-1,8										
Lithuania	2017											
	2018											
	± %											
The Netherlands	2017											
	2018											
	± %											
Norway	2017	a)										
	2018	a)										
	± %											
Poland	2017	6.100										
	2018	6.100										
	± %	0,0										
Portugal	2017	16.800			2.100	360	12.340		2.000			
	2018	16.496			1.800	2.360	12.336		1.700		14.796	
	± %	-1,8			-14,3	555,6	0,0		-15,0			
Slovenia	2017	842										
	2018	755										
	± %	-10,3										
Spain	2017	15.096										
	2018	14.400										
	± %	-4,6										
Sweden	2017	8.312										
	2018	8.792										
	± %	5,8										
Switzerland	2017	2.021	2.021									
	2018	2.086	2.086									
	± %	3,2	3,2									
Turkey	2017	25.000	13.000	3.750	3.000	1.000	5.250	5.000	4.500	2.500		
	2018	30.709	15.750	4.250	3.750	1.750	6.000	6.209	5.500	3.250		
	± %	22,8	21,2	13,3	25,0	75,0	14,3	24,2	22,2	30,0		
United Kingdom	2017	8.500										
	2018	8.670										
	± %	2,0										

a) only 2 foundries = no data collection

b) estimated

LIGHT AND ULTRALIGHT CASTINGS

Table 28

Total production in t - Light and ultralight castings

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria	138.029	140.749	147.096	148.287	150.559	0,8	1,5
Belgium	742	878	783	799	799	2,0	0,0
Bulgaria				5.540			
Croatia	22.075		25.174				
Czech Rep.	90.000 a)	95.000 a)	98.000 a)	101.000 a)	102.500 a)	3,1	1,5
Denmark	2.756	3.086	3.117	3.014	2.566	-3,3	-14,9
Finland	2.854	2.240	2.114	2.548	2.395	20,5	-6,0
France	297.117	316.931	324.102	346.899	394.727	7,0	13,8
Germany	1.008.795 b)	1.087.211 b)	1.114.105 b)	1.137.096	1.038.211	2,1	-8,7
Hungary	102.388	106.873	118.637	124.229	136.791	4,7	10,1
Italy	730.338	767.815	790.075	856.381	864.081	8,4	0,9
Lithuania							
The Netherlands							
Norway	6.562	7.221	6.373	5.883	6.525	-7,7	10,9
Poland	340.000 a)	334.600 a)	331.500 a)	330.000	330.000	-0,5	0,0
Portugal	23.169	29.150	32.382	35.000	37.612	8,1	7,5
Slovenia	37.244		47.610	51.209	61.315	7,6	19,7
Spain	116.374	125.652	138.591	141.810	127.159	2,3	-10,3
Sweden			46.053	46.138	48.000	0,2	4,0
Switzerland	17.120	14.922	12.902	13.373	13.790	3,7	3,1
Turkey	300.000	325.000	370.000	380.000	476.253	2,7	25,3
United Kingdom	113.400	113.400	126.200	136.200	149.540	7,9	9,8
Total	3.348.963	3.470.728	3.734.814	3.865.406	3.942.824		

a) estimated

b) revised

Table 29

Production value in Mio. € (a) - Light and ultralight castings

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria							
Belgium							
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland	33,3	28,7	25,9	26,3	33,6	1,5	27,7
France							
Germany b)	4.693,8	4.874,2	4.901,2	5.091,5	5.176,2	3,9	1,7
Hungary							
Italy							
Lithuania							
The Netherlands							
Norway	43,0	63,0	61,0	58,0	51,0	-4,9	-12,1
Poland							
Portugal	131,8	167,6	185,5	192,4	211,0	3,7	9,7
Slovenia							
Spain							
Sweden							
Switzerland							
Turkey	1.300,0	1.450,0	1.700,0	1.748,0	2.207,4	2,8	26,3
United Kingdom							
Total							

a) rate of exchange: Ø 2018 or fixed

b) foundries >50 employees, turnover

Table 30

Light and ultralight castings in t

Country	Year	Total Production	thereof:						general engineering	automotive industry	other
			Aluminium			Magnesium					
			Sandcast and gravity die castings	Pressure die casting	Total	Sandcast and gravity die cast.	Pressure die casting	Total			
Austria	2017	148.287	70.713	70.603	141.316	15	258	300	2.048 1.845 -9,9	500 550 10,0	91.830 89.046 -3,0
	2018	150.559	25.476	119.219	144.695						
	± %	1,5	-64,0	68,9	2,4						
Belgium	2017	799									
	2018	799									
	± %	0,0									
Bulgaria	2017	5.540,0									
	2018										
	± %										
Croatia	2017										
	2018										
	± %										
Czech Rep.	2017	101.000									
	2018	102.500			101.000						
	± %	1,5									
Denmark	2017	3.014									
	2018	2.566									
	± %	-14,9									
Finland	2017	2.548	1.475	1.073	2.548						
	2018	2.395	1.682	713	2.395						
	± %	-6,0	14,0	-33,6	-6,0						
France	2017	346.899									
	2018	394.727									
	± %	13,8									
Germany	2017	1.137.096	445.905	663.953	1.118.906		18.190	18.190	8.912	1.036.331	91.830
	2018	1.038.211	394.549	616.740	1.020.013		17.921	18.198	9.691	939.451	89.046
	± %	-8,7	-11,5	-7,1	-8,8		-1,5	0,0	8,7	-9,3	-3,0
Hungary	2017	124.229	62.125	61.450	123.902			327			
	2018	136.791	57.556	78.962	136.518			273			
	± %	10,1	-7,4	28,5	10,2			-16,5			
Italy	2017	856.381			848.380			8.001			
	2018	864.081			856.016			8.065			
	± %	0,9			0,9			0,8			
Lithuania	2017										
	2018										
	± %										
The Netherlands	2017										
	2018										
	± %										
Norway	2017	5.883	5.818	65	5.883						
	2018	6.525	6.525		6.525						
	± %	10,9	12,2		10,9						
Poland	2017	330.000									
	2018	330.000									
	± %	0,0									
Portugal	2017	35.000	1.757	33.243	35.000						
	2018	37.612	1.650	35.962	37.612						
	± %	7,5	-6,1	8,2	7,5						
Slovenia	2017	51.209									
	2018	61.315			52.050						
	± %	19,7									
Spain	2017	141.810									
	2018	127.159									
	± %	-10,3									
Sweden	2017	46.138			45.000			1.138			
	2018	48.000	7.200	40.800	48.000						
	± %	4,0			6,7						
Switzerland	2017	13.373	2.492	10.881	13.373						
	2018	13.790	2.314	11.476	13.790						
	± %	3,1	-7,1	5,5	3,1						
Turkey	2017	380.000,0	205.200	174.800	3.802.000	750	500	1.250			
	2018	476.253,0	244.000	231.003	475.003						
	± %	25,3	18,9	32,2	-87,5						
United Kingdom	2017	136.200			133.560			2.640			
	2018	149.540			146.900			2.640			
	± %	9,8			10,0			0,0			

ZINC

Table 31

Total production in t - Zinc

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria							
Belgium							
Bulgaria				42			
Croatia	30		25				
Czech Rep.			1.000	1.000	1.200	0,0	20,0
Denmark							
Finland	250	86	86	101	100	17,4	-1,0
France	18.083	18.083	20.329	24.719	24.854	21,6	0,5
Germany	53.294	54.661	56.247	62.188	59.205	10,6	-4,8
Hungary	3.480	3.543	2.985	1.717	1.610	-42,5	-6,2
Italy	63.961	68.254	70.474	72.007	73.303	2,2	1,8
Lithuania							
The Netherlands							
Norway							
Poland	8.000 a)	7.540 a)	7.600 a)	7.500 a)	7.500 a)	-1,3	0,0
Portugal	1.296	2.135	2.152	2.250	2.440	4,6	8,4
Slovenia	6.889		3.494		8.510		
Spain	8.426	8.771	9.079	8.941	9.020	-1,5	0,9
Sweden			8.531	9.274		8,7	
Switzerland	1.207	1.094	989	1.209	1.118	22,2	-7,5
Turkey	31.000	35.000	35.000	35.000	40.025	0,0	14,4
United Kingdom	7.800	7.800	7.000	7.350	8.085	5,0	10,0
Total	203.716	206.967	224.992	233.298	236.970		

a) estimated

Table 32

Production value in Mio. € (a) - Zinc

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria							
Belgium							
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland	1,6	1,3	0,8	0,8	1,0	0,0	25,0
France							
Germany	b)	b)	b)	b)	b)		
Hungary							
Italy							
Lithuania							
The Netherlands							
Norway							
Poland							
Portugal		16,1	17,0	18,2	18,4	7,4	1,1
Slovenia							
Spain							
Sweden							
Switzerland							
Turkey	125,0	130,0	125,0	125,0	174,8	0,0	39,8
United Kingdom							
Total							

a) rate of exchange: Ø 2018 or fixed

b) included in table 33

Table 33

Zinc in t

Country	Year	Total Production	thereof:				
			Sandcast and Gravity die casting	Pressure die casting	general engineering	automotive industry	other
Austria	2017						
	2018						
	± %						
Belgium	2017						
	2018						
	± %						
Bulgaria	2017	42					
	2018						
	± %						
Croatia	2017						
	2018						
	± %						
Czech Rep.	2017	1.000					
	2018	1.200					
	± %	20,0					
Denmark	2017						
	2018						
	± %						
Finland	2017	101			101		
	2018	100			100		
	± %	-1,0			-1,0		
France	2017	24.719					
	2018	24.854					
	± %	0,5					
Germany	2017	62.188		62.188	407	2.054	59.727
	2018	59.205		59.252	121	1.395	57.689
	± %	-4,8		-4,7	-70,3	-32,1	-3,4
Hungary	2017	1.717					
	2018	1.610					
	± %	-6,2					
Italy	2017	72.007					
	2018	73.303					
	± %	1,8					
Lithuania	2017						
	2018						
	± %						
The Netherlands	2017						
	2018						
	± %						
Norway	2017						
	2018						
	± %						
Poland	2017	7.500 a)					
	2018	7.500 a)					
	± %	0,0					
Portugal	2017	2.250			2.250,0		
	2018	2.440			2.440,0		
	± %	8,4			8,4		
Slovenia	2017						
	2018	8.510					
	± %						
Spain	2017	8.941					
	2018	9.020					
	± %	0,9					
Sweden	2017	9.274					
	2018						
	± %	-100,0					
Switzerland	2017	1.209					
	2018	1.118					
	± %	-7,5					
Turkey	2017	35.000			4.500	8.500	22.000
	2018	40.025			6.025	10.500	23.500
	± %	14,4			33,9	23,5	6,8
United Kingdom	2017	7.350					
	2018	8.085					
	± %	10,0					

a) estimated

OTHER ALLOY CASTINGS

Table 34

Total production in t - Other alloy castings

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria							
Belgium							
Bulgaria							
Croatia	20		15				
Czech Rep.							
Denmark	102	207	128	100	89	-21,9	-11,0
Finland							
France	2.754	2.533	2.340	2.501	2.424	6,9	-3,1
Germany	13	2	1	4	5	287,2	42,4
Hungary	115	169	123		93		
Italy	697	630	654	700	983	7,0	40,4
Lithuania							
The Netherlands							
Norway							
Poland a)	4.300	3.860	2.900	2.900	2.900	0,0	0,0
Portugal							
Slovenia							
Spain	665	711	706	850	2.516	20,4	196,0
Sweden							
Switzerland							
Turkey							
United Kingdom	1.000	1.000					
Total	9.666	9.112	6.867	7.055	9.010		

a) estimated

Table 35

Production value in Mio. € (a) - Other alloy castings

Country	2014	2015	2016	2017	2018	2017 : 2016	2018 : 2017
						+/- %	
Austria							
Belgium							
Bulgaria							
Croatia							
Czech Rep.							
Denmark							
Finland							
France							
Germany							
Hungary							
Italy							
Lithuania							
The Netherlands							
Norway							
Poland							
Portugal							
Slovenia							
Spain							
Sweden							
Switzerland							
Turkey							
United Kingdom							
Total							

a) rate of exchange: Ø 2018 or fixed

Table 36

Other alloy castings in t

Country	Year	Total Production	thereof:	
			Sandcast and Gravity die casting	Pressure die casting
Austria	2017			
	2018			
	± %			
Belgium	2017			
	2018			
	± %			
Bulgaria	2017			
	2018			
	± %			
Croatia	2017			
	2018			
	± %			
Czech Rep.	2017			
	2018			
	± %			
Denmark	2017	100		
	2018	89		
	± %	-11,0		
Finland	2017			
	2018			
	± %			
France	2017	2.501		
	2018	2.424		
	± %	-3,1		
Germany	2017	4		
	2018	5		
	± %	42,4		
Hungary	2017			
	2018	93		
	± %			
Italy	2017	700		
	2018	983		
	± %	40,4		
Lithuania	2017			
	2018			
	± %			
The Netherlands	2017			
	2018			
	± %			
Norway	2017			
	2018			
	± %			
Poland	2017	2.900 a)		
	2018	2.900 a)		
	± %	0,0		
Portugal	2017			
	2018			
	± %			
Slovenia	2017			
	2018			
	± %			
Spain	2017	850		
	2018	2.516		
	± %	196,0		
Sweden	2017			
	2018			
	± %			
Switzerland	2017			
	2018			
	± %			
Turkey	2017			
	2018			
	± %			
United Kingdom	2017			
	2018			
	± %			

a) estimated

WORLD PRODUCTION

Table 37

World production 2017, selected countries - Iron and Steel castings in t

			Iron castings	Nodular iron castings	Malleable iron castings	Steel castings	Total
Austria	na		42.900	102.900	A	10.800	156.600
Belarus							
Belgium			26.900	8.400	A	7.300	42.600
Bosnia/Herzegovina *			17.500	9.100		1.350	27.950
Brazil			1.261.107	517.222		186.616	1.964.945
Bulgaria			30.300	9.200	A	10.400	49.900
Canada		**	330.841			90.091	420.932
China			21.150.000	13.750.000	600.000	5.550.000	41.050.000
Croatia *			31.100	11.800		50	42.950
Czech. Rep.			176.000	55.000	A	64.000	295.000
Denmark			27.500	56.100	A	0	83.600
Egypt			175.000	0		10.000	185.000
Finland			19.500	36.300	A	6.200	62.000
France			574.100	696.300	A	60.400	1.330.800
Germany			2.421.400	1.587.700	A	175.800	4.184.900
United Kingdom			138.000	196.000	A	44.700	378.700
Hungary			24.600	54.500	A	3.100	82.200
India			8.442.300	1.227.200	50.000	1.030.200	10.749.700
Italy			755.800	425.100	A	54.100	1.235.000
Japan			2.281.000	1.403.612	42.000	161.900	3.888.512
Korea (Republik of)			1.019.800	686.500	2.000	159.800	1.868.100
Mexico	na		892.188	526.897		373.965	1.793.050
Norway			8.300	21.100	A		29.400
Pakistan			163.000	24.730		45.550	233.280
Poland			480.000	160.000	A	50.000	690.000
Portugal			41.500	97.200	A	5.900	144.600
Romania			20.000	3.500		7.000	30.500
Russia		E	2.637.500	-		862.500	3.500.000
Serbia			26.300	3.100		18.150	47.550
Slovenia			75.100	38.600	A	30.200	143.900
South Africa			140.000	157.000		93.500	390.500
Spain			365.700	698.100	A	64.900	1.128.700
Sweden			159.400	55.600	A	21.750	236.750
Switzerland			36.500	22.800	A	1.100	60.400
Taiwan			605.081	208.293		66.193	879.567
Thailand							
Turkey			720.000	825.000	A	170.000	1.715.000
Ukraine **			400.000	120.000	30.000	580.000	1.130.000
United States			3.327.027	2.633.294	40.034	1.264.026	7.264.381

Source: Modern Casting, data can differ from CAEF data

A) Includes Malleable Iron

* 2016 Results

E) All Iron

** 2015 Results

na= not available

Table 38

World Production 2017 selected countries - Non-ferrous metal castings in t

			Copper		Aluminum		Magnesium		Zinc		Others		Total
Austria					148.287								148.287
Belarus	na												
Belgium					799								799
Bosnia/Herzegovina *					10.500								10.500
Brazil			20.811		223.359		5.458		1.154				250.782
Bulgaria			292		5.540				42				5.874
Canada			14.237	**	211.374	B							225.611
China			800.000		7.300.000	C					250.000		8.350.000
Croatia *			221		25.174				25		15		25.435
Czech. Rep.			20.000		101.000				1.000				122.000
Denmark			1.292		3.014						100		4.406
Egypt			8.000		7.000								15.000
Finland			3.247		2.548				101				5.896
France			17.877		346.899				24.719		2.501		391.996
Germany			79.192		1.137.096		18.190		62.188		4		1.296.670
United Kingdom			8.500		136.200		2.640		7.350				154.690
Hungary			1.799		124.229		327		1.717				128.072
India					1.305.400								1.305.400
Italy			71.007		856.381		8.001		72.007		700		1.008.096
Japan			75.401		1.489.700	D							1.565.101
Korea (Republik of)			25.700		629.400						13.000		668.100
Mexico			217.200		817.911				81.300				1.116.411
Norway					8.883								8.883
Pakistan			15.540		17.600								33.140
Poland			6.100		330.000				7.500		2.900		346.500
Portugal			16.800		35.000				2.250				54.050
Romania			4.500		70.000		7.000		500		250		82.250
Russia					725.000	F							725.000
Serbia			3.100		10.120		1		30				13.251
Slovenia			842		51.209								52.051
South Africa			14.000		38.000				500				52.500
Spain			15.096		141.810				8.941		850		166.697
Sweden			8.312		46.138		1.138		9.274				64.862
Switzerland			2.021		13.373				1.209				16.603
Taiwan			30.826		368.286								399.112
Thailand	na												
Turkey			25.000		380.000				35.000				440.000
Ukraine **			60.000		280.000		15.000		25.000		50.000		430.000
United States			209.369		1.679.072		138.890		325.062		51.292		2.403.685

Source: Modern Casting, data can differ from CAEF data

B) Source: Aluminum Association

* 2016 Results

C) Includes Magnesium

** 2015 Results

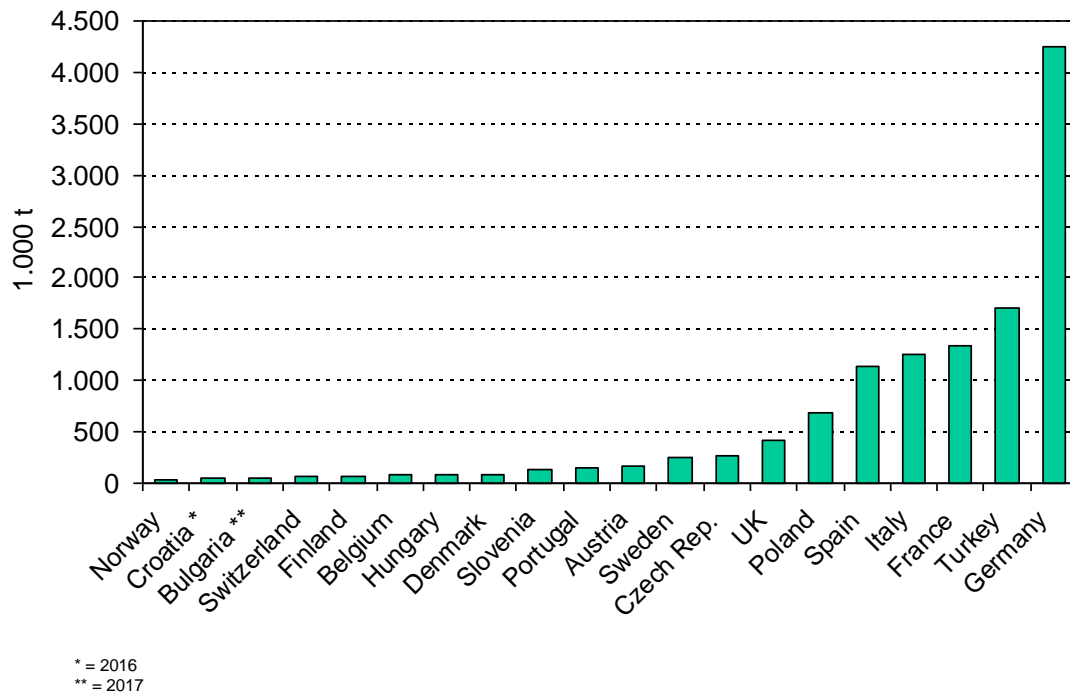
D) Includes all diecasting

na= not available

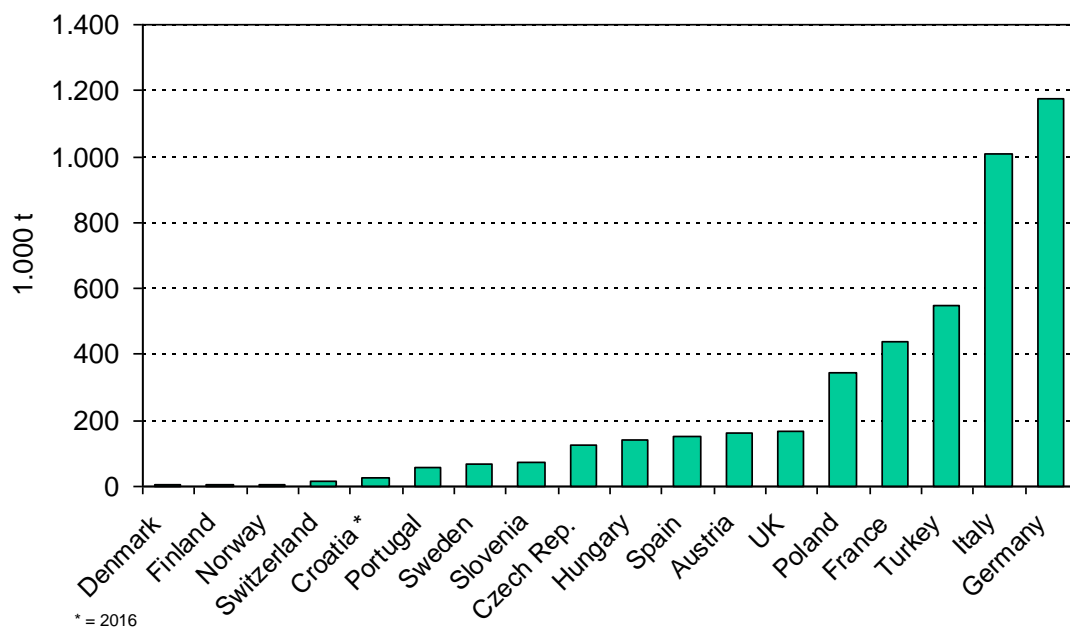
F) All nonferrous

GRAPHS

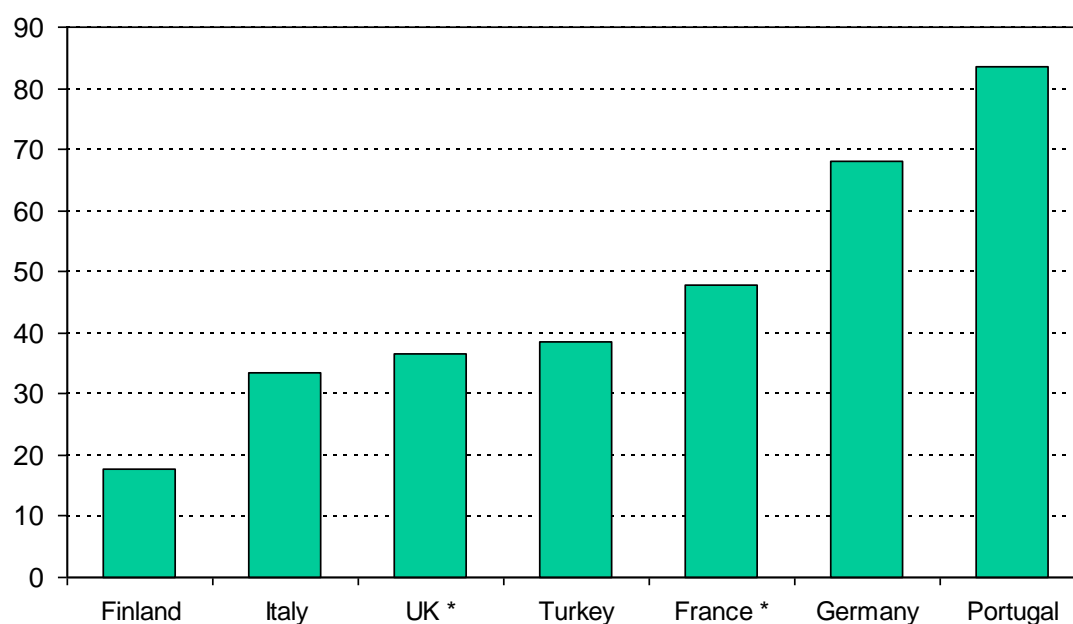
Production of Iron, Ductile Iron and Steel Castings in the European Foundry Industry 2018



Production of Non-Ferrous Metal Castings in the European Foundry Industry 2018

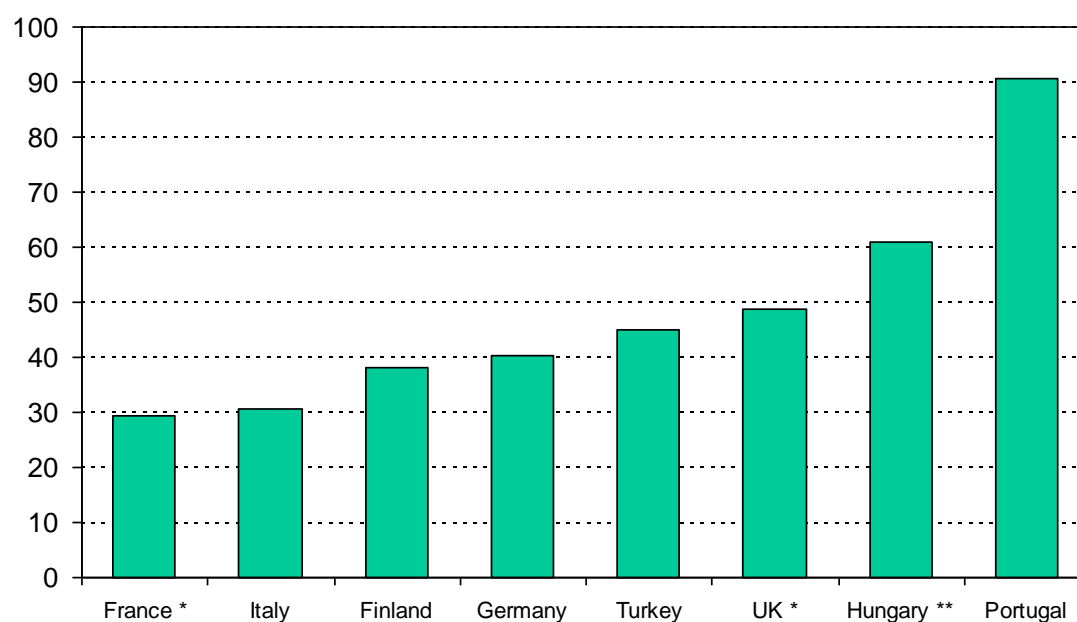


Iron Castings for the Vehicle Industry National Production Share in Percentage 2018



* = 2016

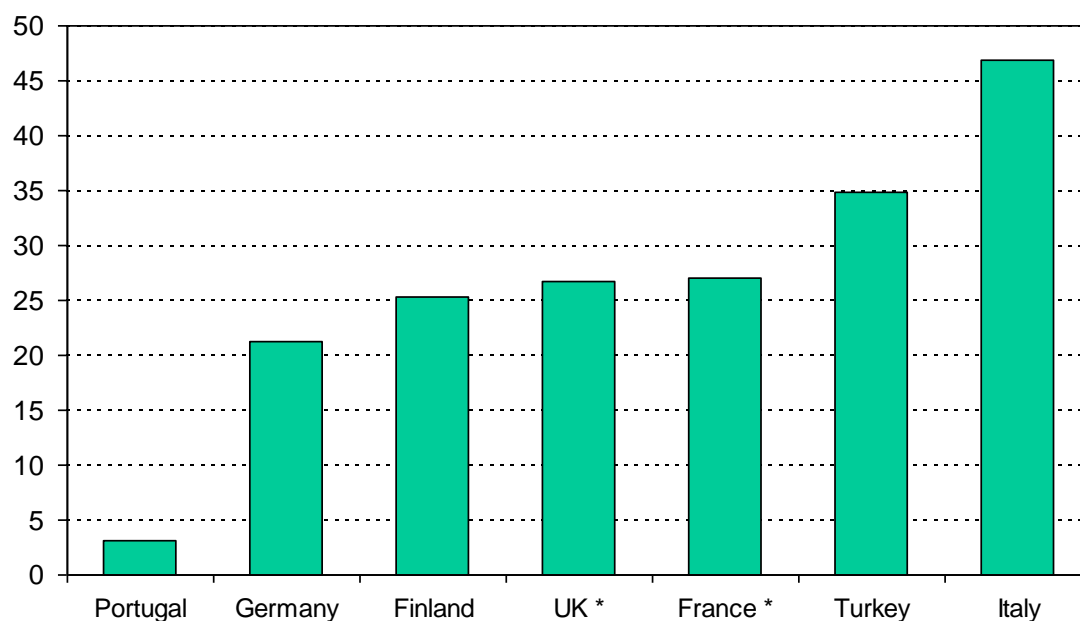
Ductile Iron Castings for the Vehicle Industry National Production Share in Percentage 2018



* = 2016

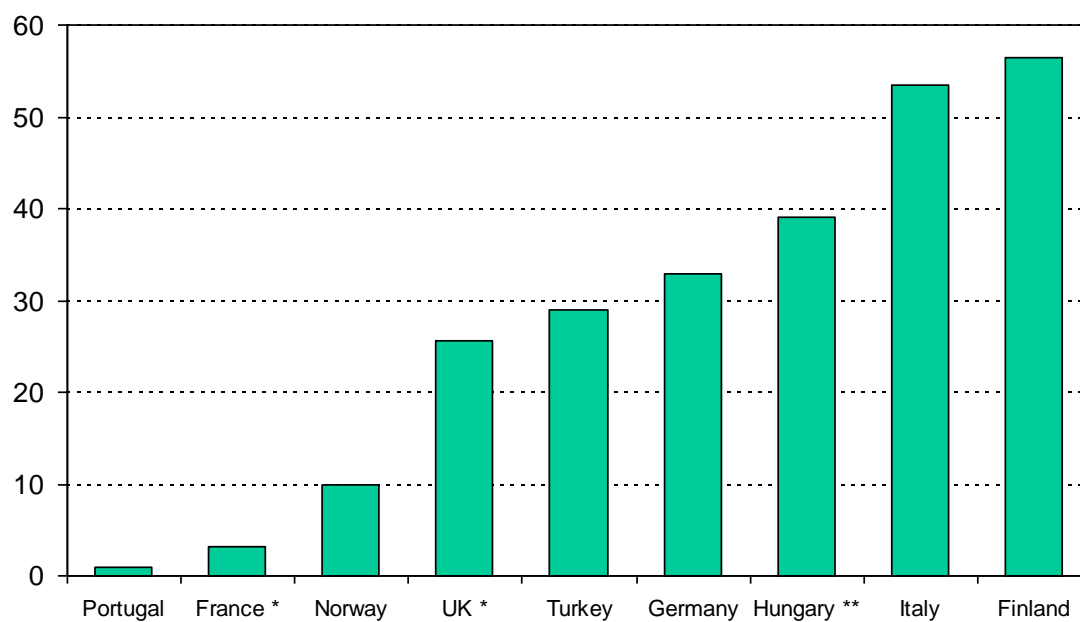
** = 2017

Iron Castings for Engineering Plant and Machinery National Production Share in Percentage 2018



* = 2016

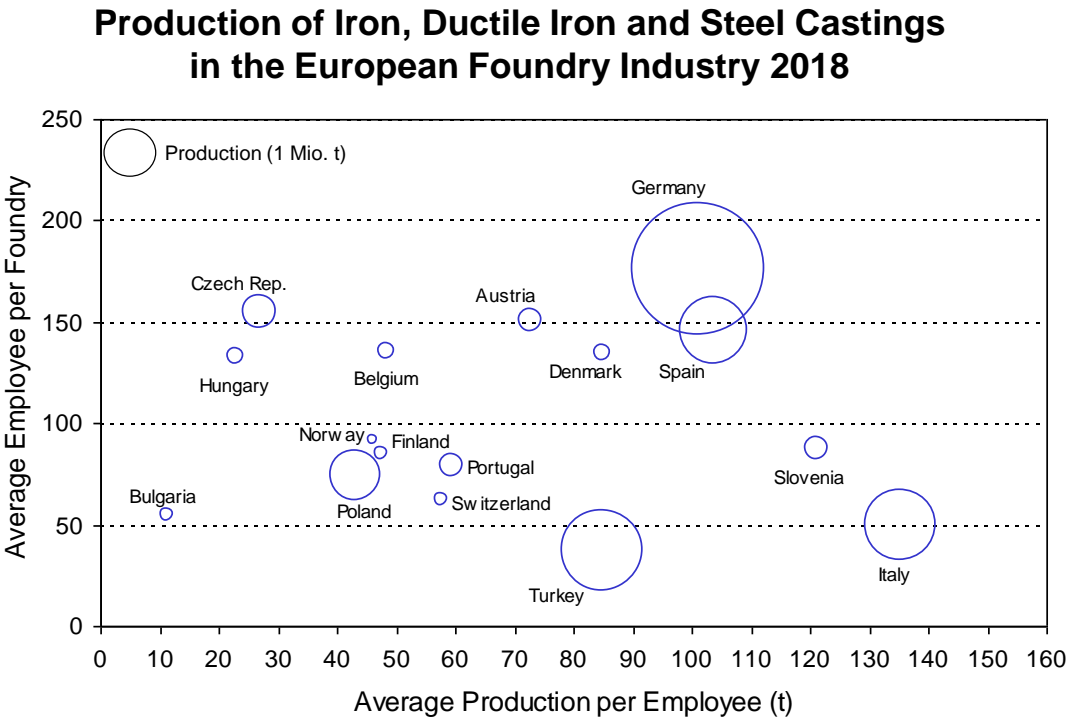
Ductile Iron Castings for Engineering Plant and Machinery National Production Share in Percentage 2018



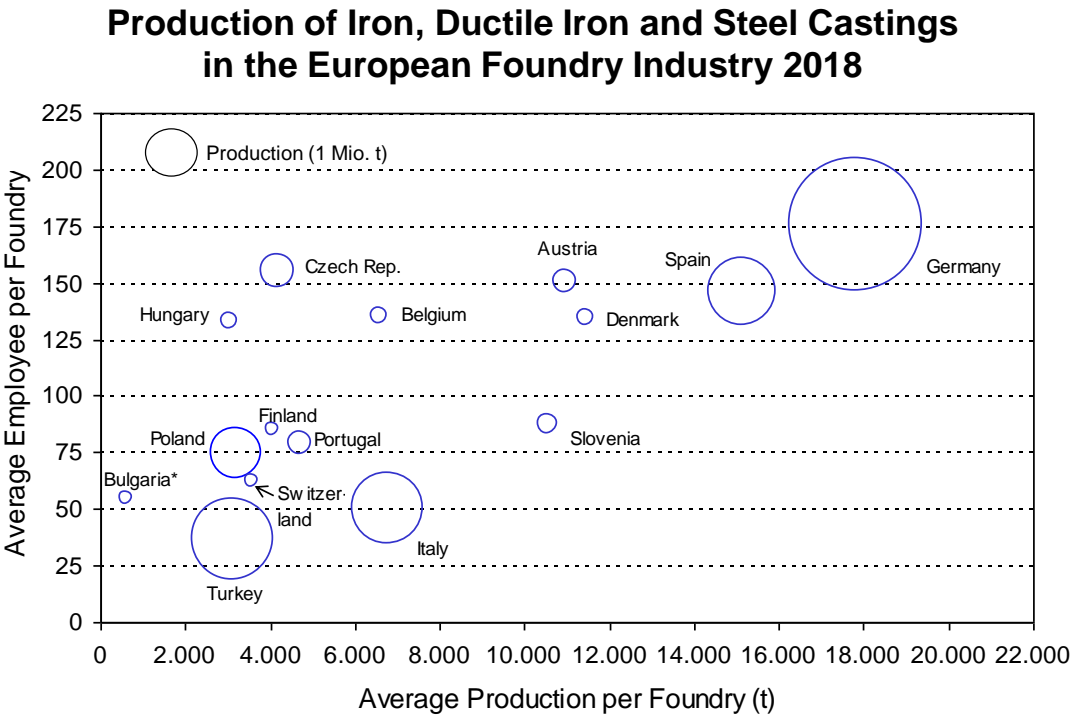
* = 2016

** = 2017

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

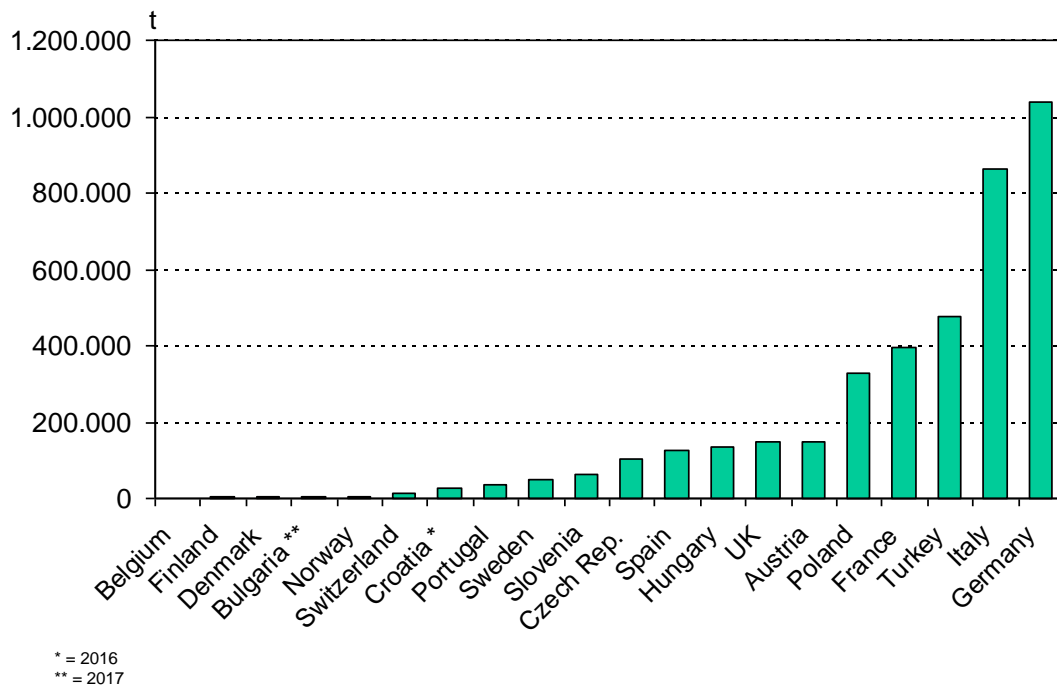


Average Production per Foundry - Iron, Steel and Malleable Iron Castings

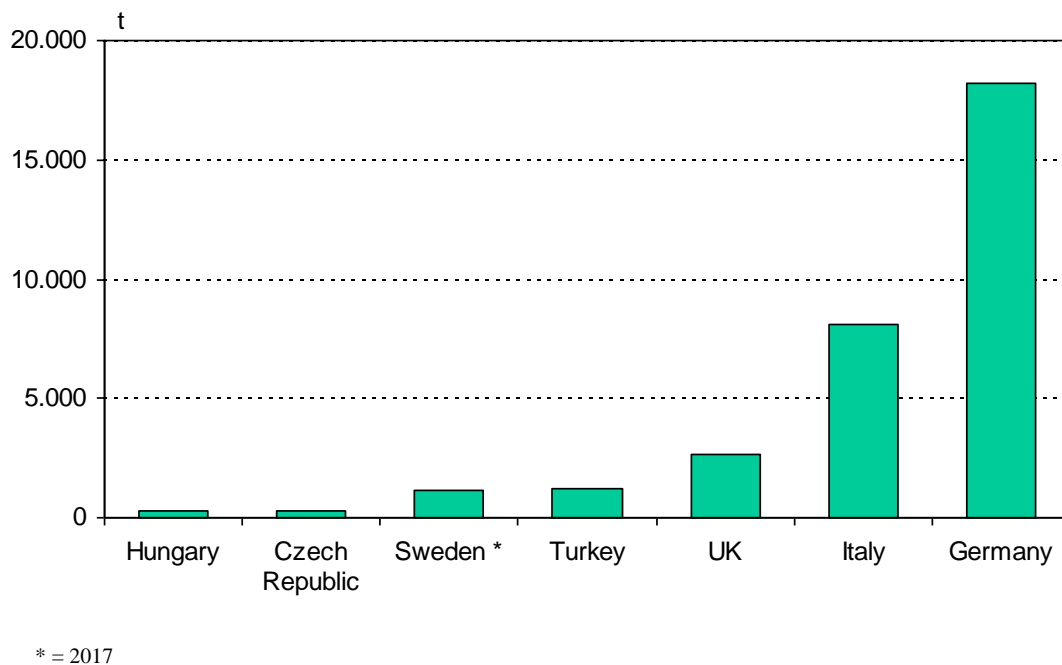


* = 2017

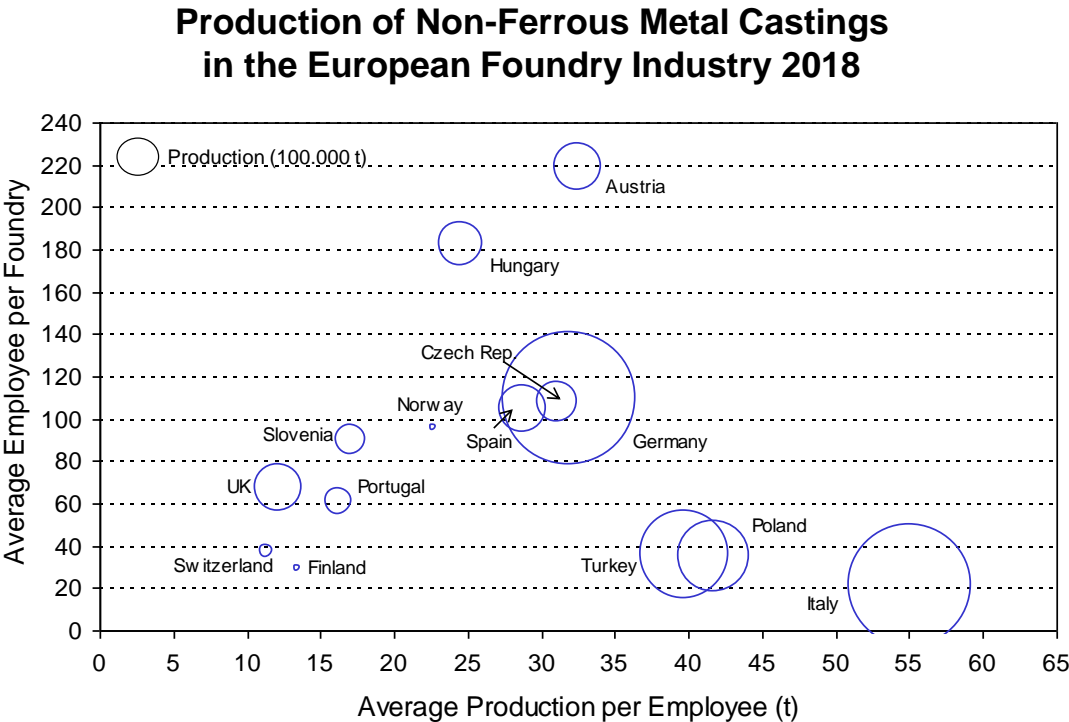
Production of Light and Ultralight Castings in the European Foundry Industry 2018



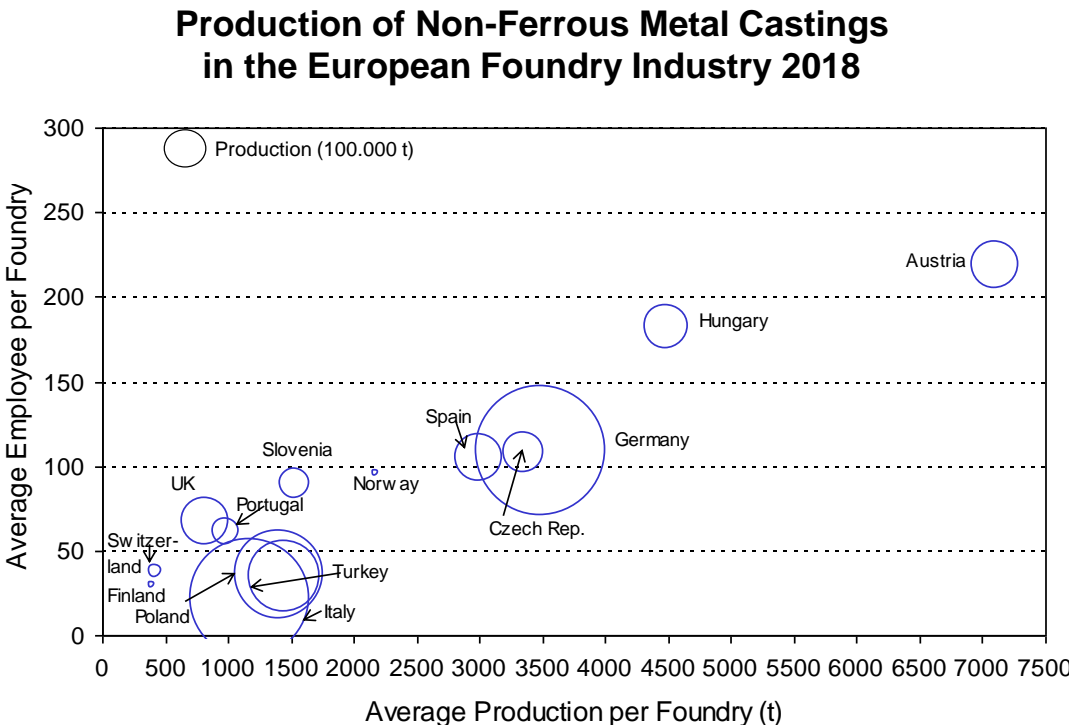
Major Producers of Magnesium Castings in the European Foundry Industry 2018



Average Production per Employee – Non-Ferrous Metal Castings



Average Production per Foundry – Non-Ferrous Metal Castings



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