

SEP 2020

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XXI

MACHINE TOOL XXI



2020
EDITION

Trade Fairs | Meeting Point

600 MILLION IN MT TRADE BETWEEN GERMANY AND SPAIN

Over 40 percent corresponds to tools and components

Industrial dealings with Germany in the field of machine tools for metalworking have been ongoing and fluid since the 1960s. At that time, Spain's process of industrialisation attracted German firms seeking mainly to invest and sell, although they also purchased, as shown by the sector's first trade fair held in Bilbao in 1961. Sixty years on, trade flows in machine tooling between Germany and Spain now exceed 600 million euros, according to the presentation made in Bilbao by AMB Stuttgart, whose next edition has been put back to 13-17 September 2022.

In recent years, this trade show has become the main marketplace with German and northern European companies. Several Basque exporters have told Empresa XXI that the 2018 edition was a great success in the attraction of both customers and projects.

NOT JUST MACHINERY

The AMB Stuttgart fair is attended by industrial companies from Germany, Europe's powerhouse, with these firms also being the foremost destination for Spanish and Basque MT exports, as well as the main supplier.

German firms sold products in Spain for a volume of more than 450 million euros in 2019, of which almost half were special tools and components.

In return, Spanish exports exceeded 155 million, of which 65 million corresponded to tools and components.

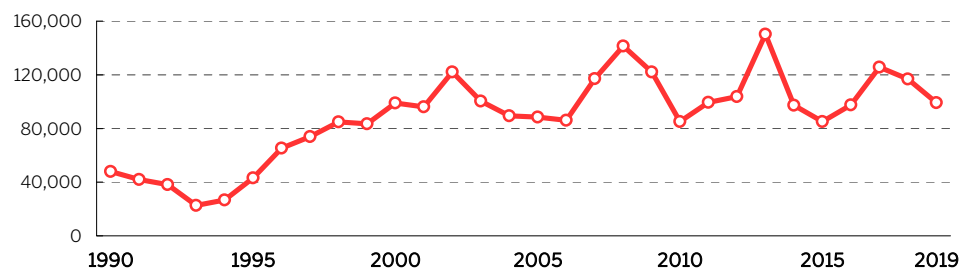


Image of the AMB Trade Show in Stuttgart, whose next edition is to be held from 13 to 17 September 2022.

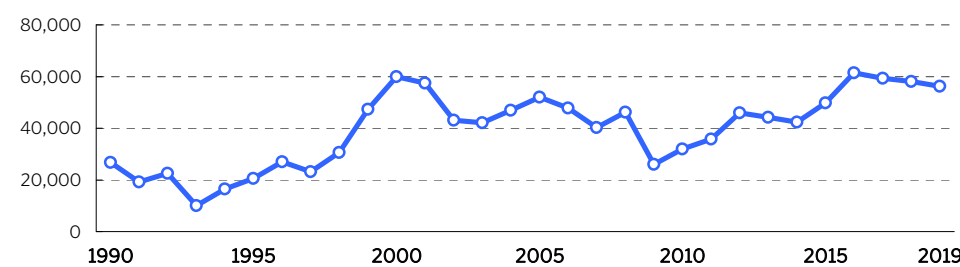
GERMANY, THE LARGEST SUPPLIER AND MAIN RECIPIENT OF MACHINE TOOLS TRADED WITH THE BASQUE COUNTRY AND SPAIN

AMB IS THE MAIN COMMERCIAL NEXUS WITH GERMANY'S DOMESTIC MARKET

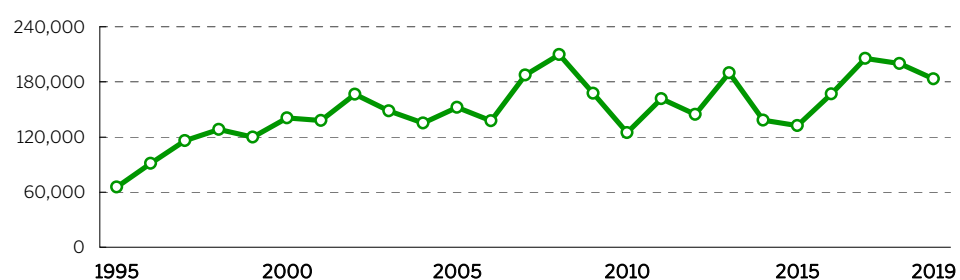
SALES OF BASQUE MTS TO GERMANY, 1990-2019



SALES OF GERMAN MTS TO THE BASQUE COUNTRY



SALES OF SPANISH MTS TO GERMANY



Basque Country-Germany, in thousand euros. Machine tools for metalworking and other machine tooling. Source: Eustat. Spain-Germany, in thousand euros. Machine tools for metalworking. Source: Secretary of State for Trade.

TAKING THE SECTOR'S TEMPERATURE

AFM and BEC are set to hold the 31st Spanish Machine Tool Biennial in Bilbao, from 23 to 27 November, with the attendance expected of manufacturers from 25 countries

A new exhibition of the Machine Tool and Advanced Manufacturing sector is to be held at the Bilbao Exhibition Center (BEC) between 23 and 27 November with another edition of the Spanish Machine Tool Biennial (BIEMH). The event will provide an opportunity to "take the temperature" of both the sector and of industry in general following the lockdown imposed by Covid-19, which forced the postponement of the trade fair initially scheduled for May this year.

AFM and BEX, as organisers of the 31st BIEMH, expect to attract 1,100 exhibitors from 25 countries, who will showcase 2,360 products and 154 new developments with the overriding purpose of introducing visitors to 'the technology that will change the world'. Under this banner, the makers of lathes and forming machines, tools, accessories and components, and equipment, together with delegates from

BEDIGITAL, ADDIT 3D AND IMIC WILL COMBINE DIGITAL TECHNOLOGY, ADDITIVE MANUFACTURING AND MAINTENANCE IN PABELLÓN 4.0

OVER A THOUSAND EXHIBITORS

the automation sector, systems for predictive processes, metrology and quality control, as well as advanced services, will be displaying their cutting-edge technologies that are revolutionising manufacturing, as they hold demonstrations at the highest level.

In its role as a forum for the transfer of knowledge in advanced manufacturing, the BIEMH has prepared a programme of lectures on subjects related to the digitisation of processes, cybersecurity, additive manufacturing, Big Data, IoT, Cloud Services, Virtual Reality, and the latest generation of technologies on 'smart maintenance' and its applications.

FOUR FAIRS IN ONE

As in previous editions, the BIEMH will also involve three supplementary exhibitions at the hall 'Pabellón 4.0', which will be presenting solutions in the digitisation of processes



In 2019, the 30th BIEMH attracted 1,751 exhibitors and 42,445 visitors.

and in additive manufacturing, as part of the industry 4.0 revolution. This area will host the third edition of BeDigital, a forum devoted to the industrial application of digital technologies, and the fifth edition of Addit3D, the International Trade Show on Additive and 3D Manufacturing, which will highlight innovations in new materials, solutions for optimising parts, and ad-

vances in manufacturing in series, among others. Last but not least, the IMIC-Industrial Maintenance Innovation Conference will showcase the latest trends and developments in industrial maintenance.

The three events will share the same exhibition and display premises with their own programme of lectures delivered by international speakers.

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ITALY AND CHINA SEEK THE PANACEA OF EXPORTS

The manufacture of machine tools for metalworking in 2019 records falls of 17.2% in China, 13.3% in Japan, and 3.3% in Italy

Entre los Among the world's major machine-tool producers, Italy stands in fourth place, behind China, Germany and Japan, and ahead of the US, Taiwan, Switzerland, Spain and India.

The predictions made by the Italian Association of MT Manufacturer-UCIMU indicate that 2020 will experience a further slowdown in the industry for MTs, robots and automation. According to its forecasts, the sector's overall output will fall by 8.4 percent, to 5,900 million euros, dragged down by the figures for exports, which will decrease by 5.3 percent to 3,390 million.

Domestic consumption will shrink by 10 percent to 4,305 million, prompting a

MANUFACTURERS IMPACTED BY THE FALL IN INVESTMENT IN FIXED ASSETS

CHINA'S EXPORTS GROW 4.6% AND ITS IMPORTS FALL 20%

drop in deliveries by Italian makers (-12.2% and 2,510 million), as well as in imports (-7%).

Sources at UCIMU also expect MT to record a bigger cutback in output in 2020 than the figure of 3.8 percent in 2019, when it amounted to 5,890 million euros.

JAPAN SUFFERS IN MARCH

According to the Japanese manufacturers' association JMTBA, output in Japan, the world's second largest manufacturer, shrank 21% percent in the first two months of 2020, maintaining the trend followed in 2019, when it fell 13.3%.

The figure in percentage terms for the January-February period in 2020 was similar for sales (-26.8%)

TREND IN THE MT SECTOR IN ITALY

	2015	2016	2017	2018	2019	%19/18
Production	4,689	5,018	5,491	6,125	5,890	-3.8%
Exports	3,199	3,062	3,165	3,423	3,364	-1.7%
Domestic deliveries	1,490	1,956	2,326	2,702	2,526	-6.5%
Imports	1,193	1,226	1,369	1,592	1,444	-9.3%
Consumption	2,683	3,183	3,695	4,294	3,970	-7.5%
Trade balance	2,006	1,836	1,796	1,831	1,920	+4.9%
Imports/Consumption	44.5%	38.5%	37.0%	37.1%	36.4%	-1.9%
Exports / Production	68.2%	61.0%	57.6%	55.9%	57.1%	+2.1%

Source: Uciimu. Millions of euros. Prepared by EMPRESA XXI.

TREND IN THE MT SECTOR IN JAPAN

	Ordes	Production	Sales	Exports
2008	1,301,147	1,249,184	1,267,372	874,723
2009	411,809	486,283	514,793	321,399
2010	978,622	813,002	820,517	608,551
2011	1,326,188	1,149,394	1,170,069	855,195
2012	1,212,445	1,151,980	1,173,114	945,594
2013	1,117,049	886,372	911,286	766,495
2014	1,509,397	1,186,293	1,221,172	961,862
2015	1,480,592	1,258,087	1,310,282	932,123
2016	1,250,003	1,012,810	1,058,471	666,519
2017	1,645,554	1,129,823	1,181,505	786,221
2018	1,815,771	1,236,790	1,297,087	881,700
2019	1,229,900	1,071,910	1,118,606	735,108
*2018	15,710	10,701	11,223	7,629
*2019	10,643	9,276	9,680	6,361

Units in million yens. At 29 April 2020, 1 yen = €0.0086. *Units in million euros. Source: JMTBA. Prepared by EMPRESA XXI.

and exports (-27.2%). MT consumption in China fell 23.5% in 2019, to 22,310 million dollars. The Chinese manufacturers' association CMTBA has already announced that the Covid-19 outbreak will hinder the recovery of demand in 2020. Orders in the sector in China fell 28.2 per-

cent in 2019, while the opposite trend was recorded in exports (+4.6%) and imports (-19.6%). MT production recorded a figure of 19,420 million dollars in 2019 (-17.2% over 2018) and the downward trend will continue due to the fall in investment in the automotive industry.

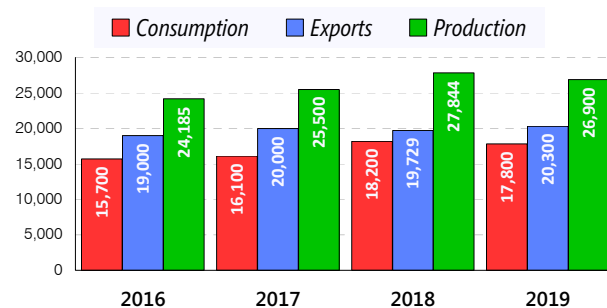
CECIMO: GLOBAL CONSUMPTION WILL NOT RETURN TO 2019 LEVELS UNTIL 2023

Los efectosThe effects of the health crisis have prompted the ongoing adjustment of the European MT industry's forecasts for the coming years. According to the latest predictions made in the most recent report published by the European Association of the Machine Tool Industries - CECIMO, the coronavirus pandemic will trigger a significant downturn in 2020, with levels of consumption in Europe falling by around 25.8 percent, after ending 2019 with an estimated figure of 17,800 million (-2.2% over 2018), which accounts for 24.7% of global consumption. The forecasts involve a change in tendency

25.8%
forecasted fall
in consumption in
2020

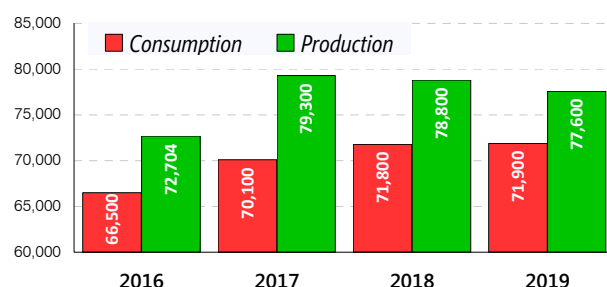
as from 2021 that will prompt a return to a figure of 17,500 million in 2023. According to CECIMO, MT consumption in Europe will increase 19.6 percent in 2021. This is a significant rise that will show that Europe's makers are capable of restructuring their businesses and recording a sound performance after a critical period for our industry. At global level, consumption will not fall, recording figures of 75,500 million in 2021 (+3.71%) and 80,400 million in 2023. The provisional data for 2019 indicate European-wide drops in production of 3.4% (26,900 million) and 1.5% worldwide.

EUROPEAN TREND IN MT



Figures in millions of euros. Source: Cecimo. Prepared by EMPRESA XXI.

GLOBAL TREND IN MT



Figures in millions of euros. Source: Cecimo. Prepared by EMPRESA XXI.

GERMANY TO EXPERIENCE A FALL IN DEMAND

The German MT industry expects a fall in output of around 18 percent in 2020 due to the decrease in orders in 2019 and in planned investment

Germany's machine-tool industry was no exception in 2019. Apart from domestic demand, which rose 4.5 percent, all the sector's annual performance indicators fell.

According to the provisional figures published in May 2020 by VDW, the German Machine Tools Builders' Association, output fell 0.39 percent in 2019, and the forecast made in February 2020 predicted a fall of 18 percent, with these expectations possibly falling even further as the year progresses.

The drop in orders of close to 22 percent recorded in 2019 will inform the business's performance this year, which has been seri-

FIGURES FOR THE TREND IN MT IN GERMANY

	2015	2016	2017	2018	2019	%19/18
Production	15,087	15,007	16,006	17,125	17,059	-0.4%
Exports	9,506	9,374	10,214	10,757	9,872	-8.2%
Domestic deliveries	4,286	4,278	4,349	5,600	4,430	-20.9%
Orders	14,950	15,950	17,220	17,460	13,660	-21.8%
Domestic consumption	7,717	7,697	7,899	8,942	9,345	+4.5%

Source: VDW. Units in million euros. Prepared by EMPRESA XXI.

ously affected following the lockdown caused by the health crisis. In January, the use of output capacity stood at 81.5 percent. We will have to wait until the third quarter to see what the scope for recovery is. According to sources at VDW, the current combination of cyclic economic slowdown, structural change in the automotive

industry, turbulence caused by trade strategies and finally, but most importantly, the coronavirus

Oxford Economics in February point to investments in fixed assets of less than one percent. This forecast is expected to decrease.

ONE OF THE TOP THREE

In recent decades, Germany's MT industry has occupied one of the leading positions in the global ranking in terms of output and exports. With a global market share of 17.3 percent in 2019, Germany stood in second place behind China and ahead of Japan. Around 64% of the country's production was exported. Half of its firms employ fewer than 250 workers, while one-tenth have a headcount of more than a thousand.

17%
is the German MT industry's global market share, behind only China

crisis, have reined in companies' readiness to invest throughout the world. The predictions made by

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Spain | MT in figures

FAREWELL TO FOUR YEARS OF GROWTH

Digitisation and the services associated with MT products and processes provide a vast array of openings for constructing a new platform for the sector's development

Spain's output in machine tools for metalworking in 2019 brought an end to four consecutive years of strong growth and, what's more, it did not manage to repeat the figure of 1,100 million euros in sales, according to the final data provided by AFM.

The cluster's own forecasts already suggested it would be difficult to emulate the invoicing record set in 2018, especially considering the uncertainties affecting one of Spanish MT's main customers, namely, the automotive industry.

Overall, AFM's members invoiced 1,049.8 million euros in 2019, 11.9 percent down on 2018, with falls of 8.7 percent in the subsector of lathes and 17.2 percent in forming machinery, the one most directly linked to the car industry, a sector that chose to postpone investments due to the changes in technology and demand associated with sustainable mobility.

At the beginning of this year, AFM predicted that 2020 would be a difficult year for the sector, al-

SPANISH OUTPUT BY TYPE OF MACHINERY

TYPE OF MACHINE	2002	2004	2006	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
REMOVAL	616.1	503.1	632.9	704.0	479.6	393.6	495.5	496.6	563.5	577.6	602.7	611.9	640.8	741.4	676.3
Lathes	88.2	73.5	112.6	115.0	90.3	82.1	88.3	95.2	114.0	138.2	156.2	153.9	139.9	149.2	-
Milling machines (*)	195.5	151.2	198.8	307.0	164.1	106.1	180.6	160.1	182.7	157.1	182.6	158.9	167.1	222.9	-
Grinders	53.8	42.4	55.1	56.0	42.3	36.9	46.5	57.6	51.1	65.2	53.6	73.3	68.6	74.1	-
Drills	8.8	7.9	11.5	10.0	12.8	8.1	14.7	18.5	17.8	15.4	20.9	15.4	-	-	-
Saws and Cutters	13.4	14.6	18.8	19.0	8.9	6.4	10.8	6.1	1.7	5.1	6.4	4.9	-	-	-
Special machines	107.1	84.0	74.4	70.0	64.7	49.3	74.7	74.3	95.0	94.1	79.4	96.6	111.3	81.1	-
Machining centres	55.6	61.4	75.7	60.0	62.2	75.7	34.5	37.7	54.3	53.9	55.1	58.5	62.4	63.9	-
Physicochemical machines	39.2	30.1	28.8	19.0	11.4	9.2	14.7	13.4	15.0	19.2	23.8	24.8	26.0	31.2	-
Other removal machines	54.6	38.0	57.2	67.0	23.0	19.8	30.7	33.9	31.9	29.1	24.4	25.3	65.4	118.9	-
FORMING	299.1	318.5	346.0	353.0	265.6	238.3	275.9	355.1	373.5	300.1	337.4	329.4	486.8	450.9	373.5
Mechanical presses	108.0	83.2	90.3	109.0	80.9	59.9	112.3	129.7	127.4	153.4	166.7	109.7	227.1	166.3	-
Hydraulic presses	28.7	42.8	33.3	42.0	32.7	31.3	29.4	48.2	32.9	12.6	19.6	63.6	118.5	82.4	-
Shears, Guillotines & Punchers	46.2	48.5	49.8	34.0	90.7	70.8	79.6	118.0	106.7	68.5	51.2	51.7	28.4	66.3	-
Folders	20.4	18.8	17.7	23.0	20.5	26.2	20.2	16.5	76.5	30.6	31.1	32.1	43.4	55.3	-
Other forming machines	95.9	125.3	154.9	145.0	40.9	50.1	34.4	42.7	30.8	35.3	68.6	72.0	69.3	80.6	-
TOTAL	915.3	821.6	978.9	1,057.0	745.1	631.9	771.3	851.7	937.0	877.7	940.1	941.4	1,127.6	1,192.3	1,049.8

(*) Including boring machines. Figures in millions of euros. Source: AFM. Prepared by EMPRESA XXI.

SPANISH EXPORTS BY COUNTRIES

COUNTRY	2014	2015	2016	2017	2018	2019	%19/18
Germany	108,162	105,989	130,603	168,303	160,523	138,129	-14.0%
U.S.A.	65,414	118,618	94,050	116,638	103,402	119,058	+15.1%
China	190,446	75,985	116,138	124,644	114,132	92,336	-19.1%
France	61,762	67,683	72,990	73,308	86,817	87,246	+0.5%
Italy	34,644	55,150	73,716	64,453	69,939	80,297	+14.8%
Portugal	48,323	58,284	79,648	64,148	78,202	77,216	-1.3%
Mexico	51,846	74,507	89,213	102,905	108,354	72,026	-33.5%
India	31,475	29,103	22,049	31,735	17,333	42,317	+144.1%
Poland	17,886	45,657	40,949	38,457	43,757	32,842	-24.9%
Turkey	19,295	21,550	22,520	24,900	19,504	28,402	+45.6%
United Kingdom	44,134	53,464	26,959	40,211	41,413	21,607	-47.8%
Brazil	36,758	36,258	20,225	21,119	14,422	20,992	+45.6%
Switzerland	3,624	8,617	9,106	24,613	24,291	19,078	-21.5%

Figures in thousand euros. 2019, provisional. Source: ICEX (CNAE 2841). Prepared by EMPRESA XXI.

SPANISH MT PRODUCTION, SALES AND CONSUMPTION

YEAR	Production	Domestic deliveries	Imports	Exports	Consumption*
1991	468.8	237.7	264.0	231.1	501.7
2000	932.0	449.1	498.3	482.9	947.4
2007	1,047.5	426.0	508.9	621.5	934.9
2008	1,056.6	320.6	473.3	736.0	793.9
2009	745.1	193.2	208.2	551.9	401.5
2010	631.9	147.8	209.7	484.2	357.5
2011	771.3	76.4	231.2	694.9	307.7
2012	851.7	69.3	233.3	782.4	302.5
2013	937.0	73.0	236.6	864.0	309.6
2014	877.7	100.5	330.6	777.2	431.1
2015	940.1	168.3	416.7	771.8	585.0
2016	941.4	106.3	477.4	835.1	583.7
2017	1,127.6	225.4	500.9	902.2	726.3
2018	1,192.3	187.9	542.2	1,004.4	730.1
2019	1,049.8	127.3	520.9	922.5	648.2

Figures in millions of euros. Source: AFM. Prepared by EMPRESA XXI.

OUTPUT IN THE FORMING MACHINE SUBSECTOR FELL 17.17% LAST YEAR DUE TO ITS GREATER EXPOSURE TO THE AUTOMOTIVE INDUSTRY

THE LATHES SECTOR MANAGED TO HOLD ITS OWN AND RESTRICTED ITS FALL TO 8.77%

1,101

million euros

the sector's figure for invoicing in 2019

though there were signs of a possible upturn in the final months.

However, the Covid-19 outbreak has had a devastating impact on most sectors, thereby making it difficult to anticipate how the year will pan out.

Nevertheless, AFM has reported that the long seasoning periods for MT orders has guaranteed a certain amount of workload at the start of the coronavirus crisis, albeit with very restricted production capaci-

ties due to the prevailing scenario.

For the time being, up to May, the placing of new orders has fallen almost 35

percent, which augurs a difficult year.

Sources at AFM in June estimated that machinery makers' revenue would fall

20 percent in 2020 and the placement of orders by almost 40 percent, which means the year will be an uphill struggle.

2020 has started off badly for Spain's MT sector according to the country's national office of statistics (INE), which has revealed that the industrial output index for machine tools for metalworking (CNAE company classification 2841) and other machine tools (CNAE company classification 2849) fell by 28.3 percent in the first quarter compared to the same period the previous year, when it grew 15.3 percent. The INE's figures reveal a gradual worsening of business in the sector as from the second half of last year. This has prompted the sharp drop already confirmed in March 2020, a month that still did not reflect the impact of the lockdown on non-essential companies in the sector due to the state of emergency decreed in Spain on 30 March to tackle the spread of Covid-19.

To put these figures into perspective, we would have to wind back a decade, to March 2010, to find a sharper collapse in output than that recorded this year, specifically of 33.1 percent.

ICEX Spain Trade & Investment has confirmed that this fall is also reflected in foreign trade. In the specific case of the export of machine tools for metalworking, in the first two months of the year

TSUNAMI AT THE START OF 2020

The manufacture of machine tools for metalworking and other MTs fell 28.3% in the first quarter



Premises of Ibarbia, a manufacturer of machining centres, in Azkoitia (Gipuzkoa, Spain).

tally with AFM's own statistics, as the association is more restrictive in the classification of machinery). Germany maintained its leadership in purchases with 138 million, albeit with a year-on-year drop of 13.7 percent. The US, with



Spanish companies had already accumulated a fall in exports of 17.5 percent compared to the same period the previous year, down to 141.8 million euros. January began with a year-on-year fall of 11.1 percent, which then doubled in February, recording a disconcerting figure of 23 percent. The downturn recorded at

the end of 2019 already provided a foretaste of the coming fall in exports in the sector of machine tools for metalworking, although not to the extent recorded at the beginning of 2020. According to ICEX, sales to third countries made by companies registered under CNAE 2841 fell by 5.5 percent, to 1,140.3 million euros (this figure does not

119 million, and Italy were the most dynamic markets. The ending of the cycle in 2019 also affected the domestic market. Imports fell 4.5 percent and totalled 722 million euros.



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EXPORTS UNDERMINE THE SECTOR

The three main customers for Basque machine-tool companies: Germany, China and France significantly reduced their purchases in 2019

Exports by Basque manufacturers of machine tools for metalworking recorded a significant downturn in 2019. This is a development of some considerable importance, as in recent years they have exported over 80% of their production. The figure of 671 million in exports -provided by Eustat- therefore leads to a projection of 940 million euros in total sales for the sector. This figure for turnover will mean falling short of the 1,000-million mark recorded in 2018 and 2017. Furthermore, the figure for exports of 671 million meant an annual downturn of 8.4% and recorded the lowest volume since 2011. It also meant dropping below the level of 700 million posted every year between 2012 and 2018.

This downturn is due to the fall in demand in the main destination markets; a situation that has been impossible to offset through secondary markets. This circumstance has been confirmed by the reduction in exports to the Basque Country's three main destinations in recent years: Germany, China and France. Between the three, they accounted for almost 37.3% of the 11,730 million euros exported between 2000 and 2019. German firms purchased 18.1% of the total; the Chinese 10.4; and the French 8.8%.

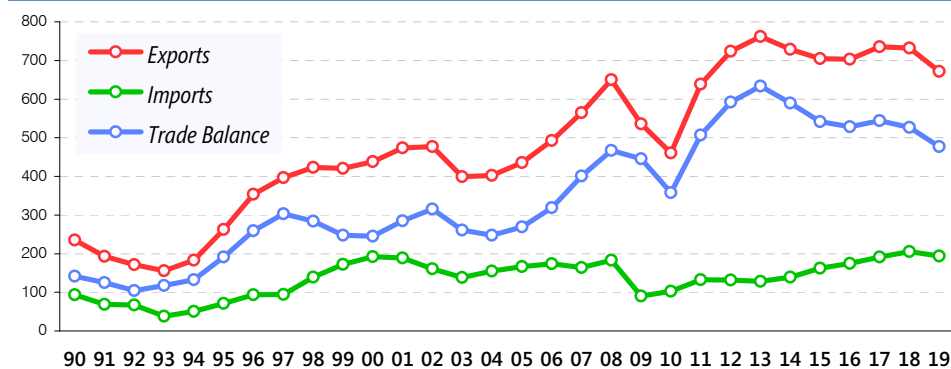
In 2019, the purchases made by these three countries fell by 15% in Germany, 28.3% in China and 12.4% in France. These figures were compounded by the fact that the sixth market, Mexico, reduced its purchases by 40.1%. Exports to the US and Italy were on a firmer footing, rising to second and third place. Sales to the US grew 18.7%, and by 26.5% to Italy. Further highlights were the increases of 145.4% to India, 78.3% to Turkey, and 644% to Aus-

MAIN DESTINATIONS FOR BASQUE MTS

	2000	2008	2016	2017	2018	2019	%19/18	%19/08
Germany	99,049	141,506	97,436	125,681	116,782	99,101	-15.1%	-30.0%
U.S.A.	43,062	20,109	81,717	84,073	61,262	72,721	+18.7%	+261.6%
Italy	42,285	69,924	62,379	52,676	55,339	70,194	+26.8%	+0.4%
China	8,438	37,090	85,899	97,767	92,424	66,232	-28.3%	+78.6%
France	53,869	55,590	61,402	46,690	62,421	54,147	-13.3%	-2.6%
Mexico	29,741	22,856	57,139	56,149	64,171	38,134	-40.6%	+66.8%
India	1,675	33,347	13,035	22,019	11,891	29,181	+145.4%	-12.5%
Portugal	27,558	13,865	19,023	14,529	25,925	24,497	-5.5%	+76.7%
Turkey	6,677	12,980	15,611	22,311	10,856	19,358	+78.3%	+49.1%
United Kingdom	21,474	15,389	25,547	25,966	32,334	17,535	-45.8%	+13.9%
Poland	2,070	14,516	27,901	24,352	28,454	17,123	-39.8%	+18.0%
Canada	4,233	1,312	1,297	10,406	11,779	8,287	-29.6%	+531.6%
Russia	1,107	45,000	13,638	9,626	9,749	8,257	-15.3%	-81.7%
Czech Republic	1,661	9,617	7,634	17,398	28,123	8,158	-71.0%	-15.2%
Brazil	7,285	24,560	12,739	14,544	6,722	8,145	+21.2%	-66.8%
Switzerland	3,393	9,616	4,827	12,685	12,540	8,074	-35.6%	-16.0%
Netherlands	9,472	6,654	5,401	6,466	9,369	7,685	-18.0%	+15.5%
Sweden	6,665	8,073	14,470	4,015	6,132	7,069	+15.3%	-12.4%
Total	437,849	650,364	703,355	735,294	732,497	671,225	-8.4%	+3.2%

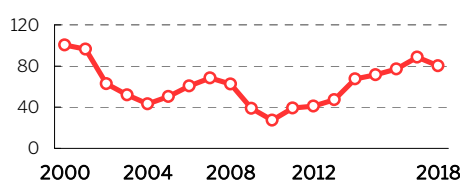
Thousand euros. Source: Eustat. Prepared by EMPRESA XXI.

FOREIGN TRADE IN MACHINE TOOLS INVOLVING BASQUE COMPANIES



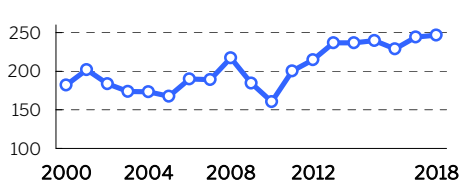
Million euros. 2019, provisional. Sales and purchases outside Spain. Source: Eustat. Prepared by EMPRESA XXI.

CASH-FLOW IN THE BASQUE MT SECTOR



Million euros. Source: Eustat. Prepared by EMPRESA XXI.

SALES/EMPLOYMENT IN THE BASQUE MT SECTOR



Million euros. Source: Eustat. Prepared by EMPRESA XXI.

tralia. These three recorded an aggregate sum of almost 60 million, slightly more than the 54 million sold to France.

As regards the origin of Basque imports (194.2 million in 2019, and a year-on-year fall of 6.9%), Germany accounted for 30% with 56.3 million and a

yearly drop of 2.9%; Italy stood in second place, with 24.6 million, down 14.9%; followed by the UK (18.5 million and +5.3%), Taiwan (14.5 million and +14.7%), Japan (13.8 million and -1.7%) and Switzerland (12.0 million and -17.2%).

An analysis of Basque for-

ign trade between 2000 and 2019 reveals a higher level of internationalisation, but a lower industrial density in the Basque Country itself.

Exports grew 53.3% over this period and imports by 0.9%. A highly significant difference in percentage terms.

CHINA IS THE MAIN DESTINATION FOR BASQUE MTS, ACCOUNTING FOR 10.4% OF EXPORTS OVER THE PERIOD 2000-2018

BETWEEN 2000 AND 2019, BASQUE MT EXPORTS ROSE 53.3%, WHILE IMPORTS INCREASED BY ONLY 0.9%

18%
of Basque exports
went to Germany
between 2000
and 2019

Basque Country | Basque MT industry

FRONT-RUNNERS WITH THEIR OWN HALLMARKS

Basque machine-tool manufacturers account for over 60% of the value of output in Spain and 75 percent of the sector's exports

Over the past 60 years, the machine-tool sector in the Basque Country has become a benchmark for manufacturing firms in Spain and an example to be followed for Basque industry in terms of innovation and export strategies. This group has lost some of its shine since the introduction of the euro and the advent of globalisation, more because of the modernisation of sectors than to any relinquishing of its hallmarks.

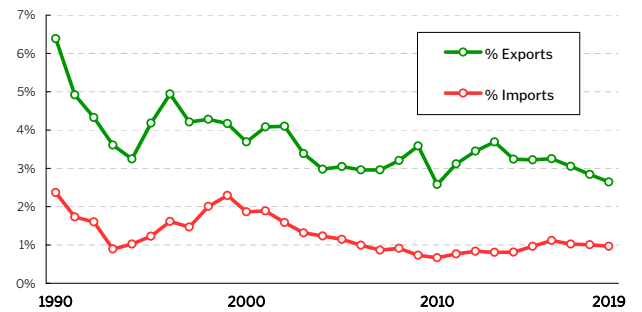
The data confirm its strength in exports and innovation. Eustat, the Basque office of statistics, has reported that MT accounted for 2.6% of all Basque exports in 2019, exceeding the figure of 1.0% it recorded in sales. The proof of MT's role as a

THE SECTOR IS SPENDING MORE ON R&D THAN THE AVERAGE FOR BASQUE INDUSTRY

frontrunner is to be found in the fact that in 1990 it accounted for 6.4% of exports; a share that fell to 4.1% in 2001 and to 3.7% in 2007. It returned to this level in 2013, and then began a gentle slide to 2.6% in 2019.

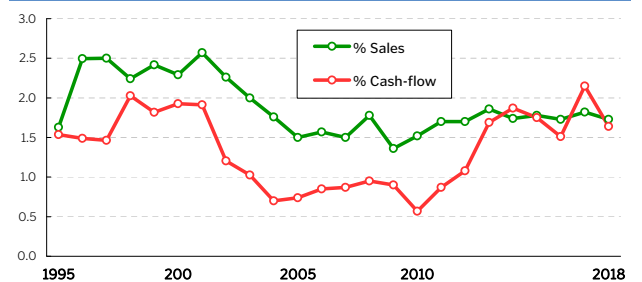
Positioning abroad requires a high rate of technological innovation. The latest figure available, 2018, attributed MTs a share of 2.32% of Basque industry's expenditure in this field, compared to 1.7 in sales. Finally, the sector maintains a return on sales that exceeds the industry average, although the balance fell in 2018. MT decreased from 6.8 percent in 2017 to 6.0 in 2018, while Basque industry as a whole climbed from 2.9 to 4.0 percent.

MH IN BASQUE FOREIGN TRADE



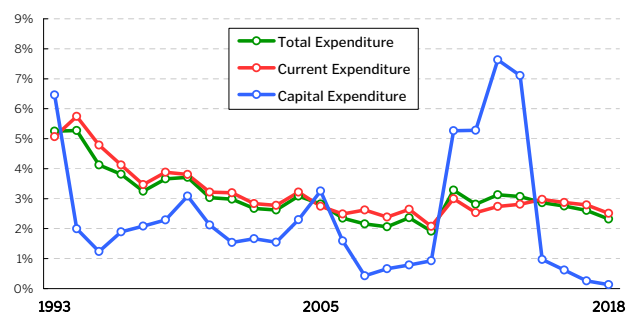
Source: Eustat. Prepared by EMPRESA XXI.

MT IN THE BASQUE COUNTRY'S INDUSTRIAL ACCOUNTS



Percentage of MT over total Basque industry. Source: Eustat. Prepared by EMPRESA XXI.

MT IN BASQUE R&D



Percentage of MT over total Basque companies. Source: Eustat. Prepared by EMPRESA XXI.

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Basque Country | MT by Provinces

GIPUZKOA LOSES DYNAMISM IN 2019

The figures for foreign trade reveal that the downturn has exceeded the Basque average, although this has not stopped its sector from accounting for 75% of the Basque Country's MT exports

The Basque province of Gipuzkoa's industry for machine tools for metalworking and other MTs was affected by the slowdown in foreign markets and the automotive sector. This scenario led to a 10.8 percent fall in exports, from 564 million euros in 2018 to 503 million in 2019. The drop exceeded the Basque average, which recorded a decrease of 8.4 percent, while the province maintained its 75 percent share of the Basque Country's total exports outside Spain.

The decrease was informed by the sharper drop in the forming machinery segment, which is more closely linked to the automotive industry, whose main manufacturers are located in this province.

The three leading markets for Gipuzkoa's MTs in 2019 were Germany, with sales of 78.8 million euros; the US, with 65.6 million; and China, 59.3 million.

The market's sluggishness was also reflected in the fewer number of firms in the MT sector. The Basque Office of Statistics, Eustat, estimated that in 2019 the province had 75 operators. This figure confirms the sector's adjustment and concentration by revealing that there were four fewer businesses than in 2018, and eight fewer than in 2017, while there are now 40 fewer than in 2008, a de-

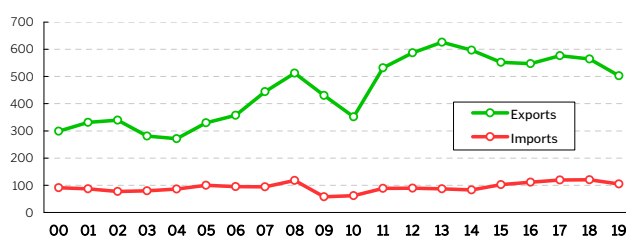
EXPORTS FROM GIPUZKOA FELL BY A YEAR-ON-YEAR FIGURE OF 10.8% IN 2019 AND THE BASQUE AUTONOMOUS COMMUNITY RECORDED THE LOWEST LEVEL SINCE 2011

GIPUZKOA'S AVERAGE EXPORTS PER BUSINESS HAD GROWN 52.7% BY 2019 COMPARED TO 2008

THE FIGURES FOR MACHINE TOOLS IN GIPUZKOA

	2008	2017	2018	%18/17	%18/08
Headcount	3,920	3,153	3,204	+1.6%	-18.3%
Personnel costs	172,104	156,656	160,311	+2.3%	-6.9%
Sales	893,765	786,075	797,370	+1.4%	-10.8%
Financial result	252	1,675	1,413	-15.6%	+460.7%
Net earnings	39,851	52,090	47,909	-8.0%	+20.2%
Costs / jobs	43,904	49,685	50,035	+0.7%	+14.0%
Sales / jobs	228,001	249,310	248,867	-0.2%	+9.2%

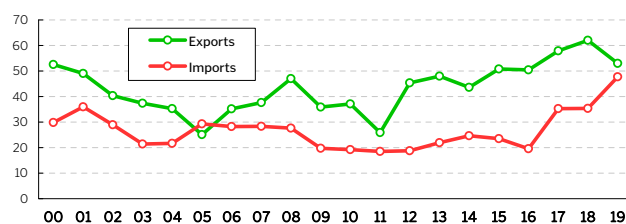
GIPUZKOA'S FOREIGN TRADE



THE FIGURES FOR MACHINE TOOLS IN ARABA

	2008	2017	2018	%18/17	%18/08
Headcount	493	306	306	+0.0%	-37.9%
Personnel costs	19,586	12,439	13,265	+6.6%	-32.3%
Sales	73,834	54,079	61,909	+14.5%	-16.2%
Net earnings	2,318	6,194	3,642	-41.2%	+57.1%
Costs / jobs	39,728	40,650	43,350	+6.6%	+9.1%
Sales / jobs	149,765	176,729	202,317	+14.5%	+35.1%

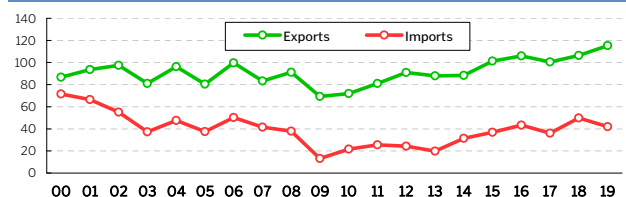
ARABA'S FOREIGN TRADE



THE FIGURES FOR MACHINE TOOLS IN BIZKAIA

	2008	2017	2018	%18/17	%18/08
Headcount	893	749	721	-3.7%	-19.3%
Personnel costs	38,496	33,849	32,088	-5.2%	-16.6%
Sales	184,389	186,886	184,089	-1.5%	-0.2%
Net earnings	-978	11,772	10,735	-8.8%	<-999%
Costs / jobs	43,109	45,192	44,505	-1.5%	+3.2%
Sales / jobs	206,483	249,514	255,325	+2.3%	+23.7%

BIZKAIA'S FOREIGN TRADE



crease of 34.8 percent.

A comparison of Eustat's various figures for the sector confirms that the firms in the province have increased in size. In 2008, they had an average headcount of 34.1 employees in 115 businesses, whereas by 2017 this figure had risen to 38.0 employees in 83 work centres.

According to the sales figures, Gipuzkoa's companies averaged a turnover of 7.7 million euros in 2008 compared to 10.1 million in 2018.

ARABA/ALAVA AND BIZKAIA

In turn, the sector in the provinces of Bizkaia and Araba/Alava averages fewer jobs and lower turnovers than in Gipuzkoa. This difference was not affected by the greater closure of businesses in Gipuzkoa, where the sector has introduced new activities and resources.

By 2019, compared to 2008, Gipuzkoa had lost 34.8% of its businesses in the sector, as opposed to 15.4% in Bizkaia and 13.3% in Araba/Alava. Nevertheless, the average headcount per centre rose from 34.1 to 38.0 in Gipuzkoa, while falling from 22.9 to 22.7 in Bizkaia, and from 32.8 to 23.5 in Araba/Alava. This competitive differential meant that the average turnover per business recorded modest growth in Bizkaia, from 4.7 million in 2008 to 5.3 in 2018, while the fall in Araba/Alava was from 4.9 to 4.8 million. The figure in Guipúzcoa jumped from 7.7 to 10.1 million.

In spite of these difficulties, Bizkaia's businesses set a new record for exports in 2019 with 115 million euros. The average per business was 3.5 million, compared to 4.1 in Araba/Alava. The average for firms in Gipuzkoa was 6.7 million in 2019, 52.7% up on 2008, compared to the increases of 47.8% in Bizkaia and 30.9% in Araba/Alava.

115

million euros

the figure for Bizkaia's exports in 2019, a new record

Spain | Components and Subsectors

BELOW THE 600 MARK

Aggregate output stood at 576.3 million in 2019 after falling 7.1%, below the milestone figure recorded the preceding year

Like a mirror image of circumstances in the machine-tool industry, components and all the other subsectors in 2019 ended four years in a row of consecutive growth, and also fell below the figure of 600 million euros of aggregate invoicing that it had easily exceeded the previous year.

The slowdown in the global economy, but above all lower local dynamism, caused havoc in the industry's subsectors, which with the exception of 'Other machinery' recorded year-on-year falls in output. In view of this, total sales stood at 576.3 million euros, 7.1 percent down on the figure posted in 2018.

The subsector of 'Components', with the highest output value in 2019, recording a figure of 194.7 million euros, was impacted by the weakness in the domestic market. In fact, its exports increased 2.9 percent, which did not impede a 7.3 percent re-

THE MACHINERY SUBSECTOR RECORDED THE BEST PERFORMANCE COMPARED TO 2018

PRODUCTION

	2015	2016	2017	2018	2019	%19/18
Components	183.1	187.9	196.4	210.0	194.7	-7.3%
Other machines	124.1	147.0	130.4	123.5	130.5	+5.6%
Tools	108.1	109.2	129.1	135.1	127.6	-5.5%
Other services	68.4	59.5	65.2	81.0	73.3	-9.5%
Accessories	57.4	61.4	70.6	71.1	65.9	-7.4%
Total	541.1	564.9	591.7	620.7	576.3	-7.1%

EXPORTS

	2015	2016	2017	2018	2019	%19/18
Components	126.6	124.5	121.4	121.9	125.5	+2.9%
Other machines	71.5	89.7	64.0	65.0	79.5	+22.4%
Tools	60.8	61.4	69.9	72.8	69.7	-4.3%
Other services	43.2	32.5	39.4	50.4	49.0	-2.8%
Accessories	37.1	41.5	42.9	48.7	47.7	-2.0%
Total	339.2	349.6	337.6	358.8	371.4	+3.5%

Figures in millions of euros. Source: AFM. Prepared by EMPRESA XXI

duction in production. This result meant that exports increased their share of the business to 64.4 percent.

In turn, 'Other machinery' climbed to second place in this group of activities by recording the best per-

formance in output and exports. An output of 130.5 million in 2019 reflected an annual increase of 5.6 percent. This increase was driven by the export market, where it recorded a noteworthy advance of 22.4 percent and a figure of 79.5

million euros. Sales to third parties accounted for 60.9 percent of production. The sub-sector with the third highest share of invoicing was 'Tools', re-

66.8%

exports

of machinery and services in 2019

ording the second-best performance in terms of output, albeit falling 5.5 percent and posting a figure of 127.6 million euros. For comparative purposes, its sales in 2018 exceeded 135 million euros. For their part, international sales, 54.6 percent of the total, held firm, dropping only 4.3 percent. This figure was slightly lower than the fall in domestic sales, which accounted for 57.9 million, shrinking 7.9 percent over 2018.

Output in 'Machining and other services' fell 9.5 percent to 73.3 million, with 66.8 percent destined for exports. Nationwide sales fell 20.6 percent. 'Accessories' fell 7.4 percent, with exports only two percent down.



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Robotics | Industrial Necessity

ROBOTS: FROM GUESTS TO STAR PERFORMERS

The number of robots rose 9% in 2018 and the IFR estimates that investments in industrial robotics will increase between 2019 and 2022 by a yearly average of 10%

The boost in automation in Spain means that new records are being set annually. According to the latest report issued by the International Federation of Robotics (IFR), industrial robotics in Spain stands in fourth position in Europe, behind Germany, Italy and France, with this status tending to become consolidated.

New technological solutions have paved the way for greater flexibility in production. Intelligent robotics and automation are essential for dealing with emerging trends. The IFR estimates that between 2019 and 2022 investments in intelligent robotics will increase by a yearly average of around 10 percent. During the World Economic Forum Annual Meeting held at Davos in January, it was noted that smart machines will account for 52 percent of the tasks in the industrial



Machine-robot cells are gaining weight in the market.

arena in 2025. This will mean a loss of 75 million jobs, although it will in turn create 133 million. According to the latest

TREND IN THE NUMBER OF ROBOTS IN SPAIN

YEAR	Units	Accumulated Total	Yearly growth	Real grand total
2008	2.461	35.508	7.4%	29,029
2009	1.833	37.341	5.1%	29,729
2010	2.019	39.360	5.4%	30,545
2011	3.006	42.366	7.6%	31,741
2012	2.355	44.721	5.5%	31,984
2013	2.850	47.571	6.4%	31,893
2014	2.129	49.700	4.4%	32,048
2015	3.710	53.410	7.5%	33,338
2016	3.919	56.631	5.6%	34,528
2017	4.180	60.400	6.6%	*32,282
2018	5.266	65.700	8.7%	35,200

Note: * The number of units corresponds to deliveries made over the past 12 years; in other words, units over 12 years old are excluded. Source: IFR and AER. Prepared by EMPRESA XXI.

data provided by IFR, 5,266 industrial robots were sold in Spain in 2018, 24 percent more than in 2017. This constitutes a new record that has been underpinned by sectors such as automation, machine manufacturing and food. The automotive sector has accounted for most of the robots. In 2018, the ratio of robots in-

stalled at these plants was 1,110 for every 10,000 employees. The number of industrial robots grew nine percent in 2018, standing at around 35,200 units. Sources at the Spanish Association for Robotics and Automation (AER) better this figure, increasing it to 37,000 in March 2020.

ROBOTS CONTINUE THEIR WORLD DOMINATION

Last February, the International Federation of Robotics (IFR) predicted that between 2020 and 2022 two million new units of industrial robots would be installed in factories throughout the world, at an annual average growth rate of 12 percent. This will raise the global complement of robots to four million in 2022.

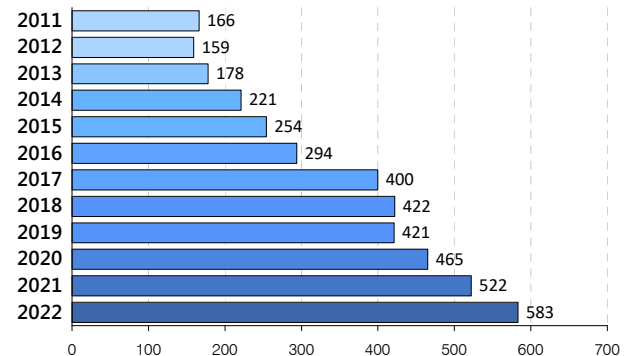
In 2018, the figure amounted to 2.4 million robots installed with a record overall sales value of 16,500 million dollars. According to a study conducted by Deloitte, the number of firms worldwide that have ramped up their robotization processes has doubled in 2019. Eight percent of top managers state that they have already overseen the implementation of 51 automation processes in their businesses, such as those involving robots, machine learning, and natural language

THE NUMBER OF FIRMS RAMPING UP THEIR ROBOTIZATION PROCESSES DOUBLED IN 2019

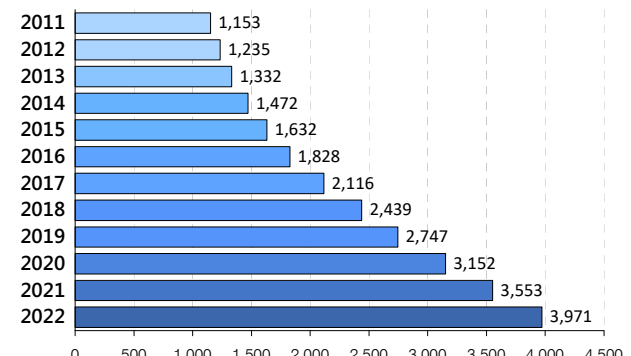
THE TRADE IN INDUSTRIAL ROBOTS IN EUROPE ROSE 7% IN 2019

procedures. This is twice the figure recorded in 2018. The long-term outlook indicates that the current trend in automation and ongoing technical improvements will be reflected in double-digit growth, with expected sales of 584,000 units in 2022, according to the forecast the IFR made in its latest World Robotics Report in September 2019. Nevertheless, the 2019 figure is expected to record a slight downward adjustment of 0.24% over the record number of units installed in 2018, which will increase again in 2020. China is the world's largest market for industrial robots, followed by Europe, where the trade in robots rose seven percent in 2018, increasing from 67,000 to 71,000 units. Spain is the tenth country in the world in terms of the number of industrial robots installed.

PREDICTED GLOBAL SALES OF INDUSTRIAL ROBOTS



GLOBAL COMPLEMENT OF INDUSTRIAL ROBOTS



Thousand of units. Source: IFR (International Federation of Robotics). Prepared by EMPRESA XXI.

The Empresa XXI Survey

MORE 'MADE IN EUROPE' AND LESS 'IN CHINA'

José Pérez (Fagor Automation), Aitor Zumárraga (CMZ) and Karlos Aranbarri (Bost) call for an industrial plan to drive the reinvention of supply chains

– Should the European Union and its Member States orchestrate a plan that prioritises investment in capital goods and machine tools? Is there a real risk for European industry if no decisive action is taken?

J. PÉREZ / FAGOR AUTOMATION

– Yes, definitively, boosting investment in capital goods and machine tools has a direct impact on the competitiveness of all the other sectors that will be vital for accelerating the recovery process that the economy needs.

What's more, we should not forget that industry is the generator of primary wealth, being part of the same system as services, which means they cannot be addressed in isolation; without industry there would be no advanced services, just as industry itself needs advanced services for its survival.

Naturally enough, the timing and determination that may apply to the pro-

JOSÉ PÉREZ

CEO
FAGOR AUTOMATION



“BOOSTING INVESTMENT IN CAPITAL GOODS WILL BE CRUCIAL FOR ACCELERATING THE RECOVERY”

grammes will be crucial for improving our competitive positioning with Europe during the recovery, which will help us to be stronger when we come out of this crisis.

AITOR ZUMARRAGA / CMZ

– There is no doubt that a plan for fostering investment in machine tools in Europe would contribute to the recovery of sales, which have currently collapsed due to the Covid-19 pandemic.

Europe's machine-tool industry is not at risk because of the existence or otherwise of a plan for supporting business investment. Europe's machine-tool industry is at risk because there are highly stringent regulations and steep manufacturing costs. It would be very helpful if things could be made a bit easier for those that want to open new businesses.

AITOR ZUMARRAGA

CEO
CMZ



“EUROPEAN INDUSTRY IS THREATENED BY HIGHLY STRINGENT REGULATIONS AND HIGH MANUFACTURING COSTS”

KARLOS ARANBARRI / BOST

– This is something that has been happening in Euskadi-The Basque Country for a long time now through different Renove plans for replacing outdated machine tools, although it is true that this kind of scheme has never been put in place nationwide, and much less so on a European scale.

As we have recently been observing, we have a long road ahead of us in developing the E.U., and any plan that fosters industrialisation by relocating manufacturing plants within Europe will, of course, be welcomed by the machine-tool sector. European industry has been under threat for many years now. I always prefer to see the glass half-full, and I think the present situation provides a great opportunity for reinventing the different supply chains.

Personally, I am greatly in favour of more “Made in Europe” and less “Made in China”.

(continued on page 14)

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The Empresa XXI Survey

(from page 13)

– What are your company's priorities in the field of technological innovation? What aspect do you think should be reinforced over the coming years, regarding both your machinery and your customers' demand requirements?

J. PÉREZ / FAGOR AUTOMATION

– We are working on concepts that are intrinsically linked to the world of machine tools, such as Artificial Intelligence, Machine Learning, Digital Twins, and smartisation.

Within a shorter time-frame, everything that involves communication with machinery, whether it involves a Human-Machine Interface (HMI) or remotely, is one of our priorities, bearing in mind the change that the world of machine-tool users is undergoing following the hiring of today's new generation of digital natives.

On the other hand, the greater precision and robustness of our components is always one of our main lines of action. And the development of new technologies along these lines is another of our priorities. We are also assigning resources to diversification processes outside the field of machine tools in such diverse sectors as the science and field of semiconductors.

AITOR ZUMARRAGA / CMZ

– Our priority is to finetune our design and means of production in order to make a better and more economical product.

Over the coming years, we are set to launch the manufacture of new models to extend our product range. This will enable us to increase our turnover. Our aim is to reach 100 million euros. We are building a new machining plant, Neoprec. We expect to have it up and running in 2021.

KARLOS ARANBARRI / BOST

– The different mechanical solutions have been around for years. Today, 80 percent of an industrial product's innovation is based on electronic and/or software solutions, which means that at Bost we are working hard to provide original solutions within the field of Industry 4.0.

KARLOS ARANBARRI
CHAIRMAN
BOST MACHINE TOOLS



“TODAY, 80% OF THE INNOVATION IN AN INDUSTRIAL PRODUCT IS BASED ON ELECTRONIC AND/OR SOFTWARE SOLUTIONS”

– What technical innovations and new features are you going to showcase at the trade fairs BIEMH in Bilbao and/or AMB in Stuttgart?

J. PÉREZ / FAGOR AUTOMATION

– Fagor Automation is going to make the most of these fairs to showcase its latest developments in control and measuring systems, introducing new solutions with detailed designs for providing holistic solutions for high-performance

machinery.

The industrial manufacturing sector is constantly evolving and calls for technologically advanced, flexible and bespoke solutions that increase productivity without any loss of precision while guaranteeing results of the utmost quality.

Within this context, Fagor Automation has developed the CNC QUERCUS automation system, a comprehensive solution that besides numerical control includes adjustment modules, power sources, communication buses, motors, involving both shafts and heads, and full digital capture systems.

Makers of industrial parts face the challenge of delivering highly demanding results in adverse working conditions. With a view to responding to this scenario, Fagor Automation has developed 3STATECH, an optoelectronic solution that we will also be introducing at both fairs.

AITOR ZUMARRAGA / CMZ

– We have a machine that we expect to be a great success. It is the TTL model, a twin-tower lathe that is characterised by two specifications that give us an edge over our competitors: firstly, the machine does not have a drive belt (it has eight integrated motors). In addition, the TTL has two towers and two headstocks and can work with three tools at the same time, as well as with a counterpoint. It's amazing!

KARLOS ARANBARRI / BOST

– I don't want to reveal our new developments at this early stage before they will be going on show at the fairs. We are very excited above all about AMB, as this is a fair at which we have traditionally made very interesting contacts, not only with German customers, but also with those from other European countries.

IN SEARCH OF TECHNOLOGICAL PARTNERSHIPS

Nerea Aranguren (Ideko)
and Agustín J. Sáenz (Tecnalia)
see progress through interaction
in the value chain

– What aspects should Europe's machine-tool sector improve for positioning and maintaining itself at the cutting-edge of the state-of-the-art? Is this at all possible without enlarging Europe's manufacturing base?

NEREA ARANGUREN/IDEKO

– From the standpoint of technological capacity, the European machine-tool sector, understood as the entire ecosystem involved (manufacturers of machinery, components, ancillary equipment, tools, software, hardware and cooperating research agents), is currently at the cutting-edge of technology as a result of a product strategy designed precisely to provide value added through technological differentiation. This situation is evidenced at any technology forum, congress or trade fair, as well as in makers' catalogues. Maintaining and strengthening this position necessarily involves boosting strategies of technological differentiation in numerous scenarios.

On the one hand, there is the strategic plan for product and business development. Within this ambit, machine-tool manufacturers should seek partnerships and generate synergies with key players, such as technology providers, large

European companies that are leaders in the field of digitisation and in the sector of machine-tool components that are essential for their operation (CNC, mechanical components, tooling) and, of course, with their customers. This will enable them to effectively provide the most innovative technological developments for equipping their machinery with new functions, providing new services, and even exploring new business models, stemming not only from a digitisation strategy, but also from more conventional developments related to precision, reliability and performance. In institutional terms, the sector should operate as a technological manufacturing provider, collaborating with the administrations at the different levels, that is, regional, national and European, so that the policies rolled out by these institutions can be transformed into R&D programmes that encapsulate key aspects for the sector. It is important to remember that we have not yet fully mastered the challenges related to more traditional technologies, such as precision, mechatronics, metrology and a core understanding of machining processes, which are still highly relevant to the competitiveness of the MT sector, so we should not focus solely on technologies associated with digitisation. A comprehensive development of

both technological areas (digitisation-‘classic’ technologies) is required for the sector’s success.

AGUSTÍN J. SÁENZ/TECNALIA

– From a technical perspective, there are three key aspects that every industrial company should consider if it wishes to remain among the frontrunners: flexibility, smart automation, and connectivity. Due to the COVID-19 crisis, a further characteristic may be added to this list, and will be the subject of considerable attention, namely, resilience.

On the other hand, digital transformation and the ability to provide remote and smart solutions for all the tasks involved in setting up, monitoring and supporting processes, which were already in themselves a major trend, will grow in importance in the socioeconomic context of the future. Furthermore, the evolution of manufacturing processes in customer sectors, which will also be transformed to suit the demands for new products in their markets (as is the case, for example, in the automotive sector with the development of electric vehicles), will influence the way in which new generations of machine tools need to adapt in order to play an integral role in these new scenarios. The ability to respond to multi-process or multi-material requirements may become increasingly important.

Outside the technical arena, it will be vital to continue investing in R&D&i in both products and processes; the differential value added regarding Asia is not simply going to “come out of the blue” and it will not be a case of “leading the pack” but instead of “not bringing up the rear”. Finally, inter-company and even public-private partnerships are essential for addressing challenges requiring a critical mass that SMEs cannot achieve on their own. We have to overcome our fear of joint-risk alliances and ventures with partners, customers and even competitors.

– Do you think that the self-imposed technological demands in the MT sector in the field of digitisation-connectivity-servitization are disproportionate in terms of demand? Do you

NEREA ARANGUREN
CEO
IDEKO



“MACHINE-TOOL MANUFACTURERS SHOULD SEEK SYNERGIES WITH KEY PLAYERS”

sense an increasing reticence among companies using machine tools to open the ‘digital’ door of their activity to the outside?

NEREA ARANGUREN/IDEKO

– As a key technology provider within the manufacturing field, the machine-tool sector has always sought to pre-empt its customers’ requests, offering new capabilities and new functions. This is a task that requires a great deal of effort and which is slowly but surely becoming a reality.

The work being done in the field of digitisation follows this line of action. Investment is being made in the generation of new capabilities to be transformed into products and services. The first results are coming to the fore and beginning to be accepted by customers.

This interaction is helping to realign initial business ideas and redirect and focus priorities, as well as the development of technology. Interaction with customers leads to cycles that evolve from curiosity, uncertainty and reticence to acceptance and adaptation. This means that digitisation is not going to radically change those companies that use machine tools, prompting them to accept total openness toward the disclosure and sharing of their data, which are often the mainstays of their competitiveness.

This gives importance to the strategy that companies in the sector are adopting, which involves adapting their digital offers to their customers’ circumstances, seeking to gain ground through the value added provided. If this value added overcomes their misgivings, the customer will open its doors. Otherwise, the value proposal made will not be enough.

AGUSTÍN J. SÁENZ/TECNALIA

– The digital changeover is required to keep the sector competitive, although it is all part of a gradual development that will guarantee steps are taken in which it transforms the interplay between manufacturers and users. Those technological demands should not be seen as a reality that will come to us all at once in the short term, but instead as a roadmap that will steadily

AGUSTÍN J. SÁENZ
CHIEF MARKET OFFICER
TECNALIA



“FLEXIBILITY, SMART AUTOMATION AND CONNECTIVITY SHOULD NOW BE JOINED BY RESILIENCE”

become part of the sector. Although digitisation and connectivity technologies are being increasingly embedded, we are still in the early stages in which the more immediate aim is to use that potential capacity for the market, and the manner in which manufacturers and users include these capabilities for transforming their businesses still needs to be consolidated.

The issues of how to monetise value added services based on the exploitation of data, how to reassure users over the use and visibility of their operations, how to manage the sale of services instead of machines, how to undertake the entire process of cybersecurity, etc., are still not yet clear in all cases, and therein lie the misgivings, but the move taken in this direction is unstoppable. They are all processes that have been successfully implemented in banking, tourism and leisure. Industry cannot, and indeed should not, therefore live with its back to the ecosystem in which we now live.

The major and rapid advances in connectivity (5G), safety-security-traceability, and artificial intelligence in the very near future will help to overcome the misgivings and doubts that some companies have today.

On the other hand, the technological capacity and offer for storing critical, confidential and private data on cloud platforms are increasingly greater, and even the most sensitive organisations in different fields in each country are migrating to these kinds of models. Industry, too, will be less vulnerable and more efficient at managing disparate kinds of data in various layers rather than storing everything locally.

– ¿Is cybersecurity suitably provided for in R&D&i plans in the MT sector?

NEREA ARANGUREN/IDEKO

– Awareness of data security and protection is an integral part of all the plans made by companies in the machine-tool sector, precisely because of their knowledge of the sector’s reality and its security con-

The Empresa XXI Survey

(from page 15)

cerns. Machine-tool companies have shared this awareness with their technology partners in the field of digitisation, refocusing developments based on data processing in the cloud toward more flexible solutions that cater for the controlled access to data in a local environment (edge and fog computing). Companies in the sector largely depend on these technology partners, which provide the platforms for gathering, storing and processing data. Both the major players, such as Siemens, and small specialised businesses, as in the case of Savvy and Vixon, are key agents for machine-tool companies in the field of cybersecurity.

AGUSTÍN J. SÁENZ/TECNALIA

– This is one of the main concerns expressed by industry in general within this technological development, although there is still a lot of progress to be made and awareness to be raised. A differentiation needs to be made between two levels in cybersecurity. On the one hand, there is a more mainstream need in industry to provide basic security mechanisms for the entire IT structure that connects plant systems and assets, and the sector will not be an exception to this. On the other hand, the move toward a business model based on service and the interlinking of the machinery involved in production requires an additional layer of cybersecurity technologies that ensure secure and reliable data transactions for deploying pay-to-use systems, smart contracts between machines, etc. This second layer involves more sophisticated technologies, but also ones that attract the interest of the innovation plans rolled out by companies in the sector, as they have a direct impact on that roadmap leading to the transformation of their business model and their dealings with customers.

– **Has the sector for manufacturing machine tools for metalworking lost ground in the funds allocated to European, national and regional R&D&I plans in recent years? Or, by con-**

trast, do you think the right balance has been struck?

NEREA ARANGUREN/IDEKO

– An initial reading of the programmes and their approach suggests that this has indeed been the case. One might deduce from such a reading that more traditional technologies, which are vital for ensuring that machine tools operate according to the core requirements of quality, performance, efficiency and sustainability, do not pose challenges that require investment in R&D, and that the issue lies in data, digitisation and artificial intelligence.

Nevertheless, the machine-tool sector is facing the task of explaining that those new digital technologies will only be successfully introduced onto the market if their development is accompanied by, and integrated within, the development of traditional technologies, mutually enriching each other. For example, AI should be used to understand and resolve problems that are beyond the more classical models, but not by ignoring them, rather feeding back off them and developing in unison.

AGUSTÍN J. SÁENZ/TECNALIA

– The machine-tool manufacturing sector has been and will continue to be highly innovative, with the percentages earmarked for R&D being well above many other sectors, although it is also true that past investment is no guarantee of a future in the medium term, and the main customer sectors for machine tools, such as the automotive, energy and aeronautics industries, require new developments at increasingly shorter notice.

The major programmes for subsidising R&D are aware of these business demands, and the main lines of action in most of the calls involve advanced smart manufacturing, digitisation, and now increasingly sustainability, and therefore cater for the bulk of these requirements.

Where the level of aid should be increased is in the financing of projects that have reached a mature state of development. From the validation of a concept,

NEREA ARANGUREN
“**ARTIFICIAL INTELLIGENCE SHOULD NOT BE AN END IN ITSELF, BUT INSTEAD A TOOL FOR IMPROVING OUR PRODUCTS**”

AGUSTÍN J. SÁENZ
“**COVID-19 AND SUPPLY PROBLEMS HAVE REINFORCED THE NOTION THAT EUROPE’S INDUSTRIAL SOVEREIGNTY SHOULD INVOLVE A STRATEGY OF NATIONAL SECURITY**”

as the outcome of an R&D project, through to marketing, there are many very expensive stages of development and industrialisation that are not easy for companies to afford. Many interesting ideas and projects wither away because they fail to receive the necessary funding between the prototype and the marketable end product. European administrations should find formulas that help to survive this “valley of death”.

– **The European Commission is working on its White Paper 2021-2027, which will lay the foundations for technological innovation over the coming years. From what we know so far, do you think that the manufacturing business and machine tools will play a leading role in it?**

NEREA ARANGUREN/IDEKO

– In recent years, within the H2020 programme, we have already been seeing that the fit between the sector and its technologies has not been so easy as in previous Framework Programmes. The emergence of “smartisation” has taken up a lot of space in EC calls and briefing documents. The advance news we are beginning to receive about the next period suggests that this situation is going to intensify, with Artificial Intelligence playing a major role.

Faced with this scenario, and as the European economy’s long-standing driving force, the sector may work on several fronts: on the one hand, there is a need to join forces with the global manufacturing sector to ensure that new technologies are merged with the challenges of more traditional technologies.

Thus, for example, AI should not be an end in itself, but a very powerful and essential tool, both for improving our products and services and for generating new ones. Along these lines, it is important to place particular emphasis on reinforcing and properly aligning the mechanisms closest to the sector, such as “Made in Europe”, the follow-up to “Factories of the Future”(FoF).

On the other hand, and has been the case over this most recent period, it is important to make an effort to align the sector’s discourse

with the language of new programmes, and position machine tools as a key area for strategic developments linked to robotics, ICTs, Artificial Intelligence, and so on.

AGUSTÍN J. SÁENZ/TECNALIA

– There is no doubt that Advanced Smart Manufacturing and sustainability are two of the pillars of technological innovation strategies at different geographical levels. Both are part of the essence of the machine-tool sector. Furthermore, thanks to the sector’s close ties with sundry customer sectors, mainly with transport and energy, the steady incorporation of innovations in processes, materials and products in these sectors will also provide a boost for the development of the manufacturing sector.

Europe has and needs a powerful, thriving and globally competitive industry, and all its strategic innovation strategies reflect this, as is only to be expected. The recent COVID-19 tsunami and the problems in the supply chain for critical equipment have simply strengthened the notion that Europe’s industrial sovereignty should be considered a strategic matter of national security.

MT in Empresa XXI | News from Sector Leaders

FAGOR AUTOMATION, GLOBAL CONTROL

R&D&i operations set to receive funding of more than 35 million euros in 2020-2024 for consolidating the digital implementation of new products and extending diversification

Fagor Automation “will not under any circumstances put a stop to its investment in R&D&i”, the cooperative’s CEO, José Pérez, has stressed to Empresa XXI. The complicated state of the market due to uncertainty and the slight downturn in sales in 2019 will not have an impact on innovation activities because “we consider it a mistake; the main thing is always to come out of a cycle in a state of readiness”. Fagor Automation is therefore earmarking more than 35 million euros for R&D&i over the five-year period 2020-2024, at an average yearly rate equal to 10 percent of its annual turnover. The priority will be “to reinforce the group’s two main assets: R&D and the sales network, as well as maintain its benchmark positioning in global control and capture solutions”. The latest results in the industrialisation of its R&D&i include such highlights as the launches of the following systems: CNC

OPENING OF AN OFFICE IN TOKYO AS THE FIRST STEP IN ITS DEPLOYMENT IN THE JAPANESE MARKET



Fagor ultra-precision testbench (10 nm per metre of uncertainty).

SUPPLY OF LINEAR ENCODERS TO THE GERMAN FIRM HELLER

Quercus automation (a more powerful, open and robust platform for adjustment and control), 3Statech positioning (optoelectronic technology for dealing with the most adverse operating conditions), and web-based HMI, which caters for the hyperconnectivity of devices and the customisation of software by end users, a scheme in which four manufacturers are already involved.

In addition, the firm is standardising its products according to the protocols of connectivity and the common languages of

‘MTConnect’ (USA) and UMATI (Europe), and the launch of Series 3 absolute linear encoders. This field has recently witnessed the securing of several agreements for the supply of capture systems, such as the one subscribed with the German firm Heller. Sales network and plans These products will be marketed through its corporate sales network, which covers 50 countries with 30 representative offices of its own. The most recent one to open, in 2019, was the dealer and services delegation in Tokyo, which

will spearhead growth in Japan.

The business will also be boosted by an original design of marketing management, which has involved the creation of ‘Leadership Groups’, whose purpose is to provide greater proximity to the market and more powerful bespoke solutions. These groups will support the sales department through the integration of “a sales rep, an application technician and a technologist who, reporting to the first of these, will help to provide a more innovative and effective offer”.

Finally, Fagor is to extend its diversification. In the case of scientific equipment, through the delivery of linear displacement sensors, which have been installed at centres such as SLAC, Argonne, Australia Synchrotron and Pohang Accelerator Laboratory; as well as angular positioning encoders for telescopes, a field in which it is working with Tekniker.

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MT in Empresa XXI | News from Sector Leaders

Bost Machine Tools has channelled the pursuit of its Hazitek Fusée plan, backed by the Basque Government, toward the diversification of its range “through the development of new technologies such as the machining of composites and carbon fibre”. The CEO at Bost, Karlos Aranbarri, has told Empresa XXI that “the Fusée project has focused particularly on the machining of structural pieces made of carbon fibre, such as rocket components for the aerospace industry”. The work undertaken by the engineering and R&D teams at Bost has involved the design of a machine that has enabled the company to win over “a major French operator in the aerospace industry”, which will use the equipment to manufacture carbon fibre hoods for the thrust engines on the Ariane 6 rocket, whose maiden launch is scheduled for this very summer. The European Space Agency (ESA) assigned this project to the group formed by Airbus Safran Launchers.

Bost’s machine fulfils the demanding requirements for the machining of components of this nature: oil-free systems (non-hydrostatic machinery); high revolutions through Torque-type operation for rotary shafts, and an ultra-high-speed electro-mandrel



MTs designed as part of the Fusée project for machining Ariane engine components.

MTS DESIGNED AS PART OF THE FUSÉE PROJECT FOR MACHINING ARIANE ENGINE COMPONENTS

BOST FORGES AHEAD WITH HAZITEK FUSÉE

Diversification of its range for machining composites and carbon fibre

mounted on the milling heads; five-axis machining; continuous turning; and aspiration system (local on the tool tip and general in the working area) for carbon fibre dust (highly

toxic). The approach taken by its R&D&i confirms its positioning in the aerospace field. The highlights among its latest innovations include the development of

two specific plans for aeronautics and a vertical lathe supported by CDTI: a new dynamic RAM and faceplate operation using a high-performance Torque-type cartridge.

AGME RECEIVES ORDERS FOR MACHINERY FOR TESLA

Agme Automated Assembly Solutions, specialised in the manufacture of special machinery, is focusing on the design and production of new automatic assembly solutions, the diversification of technologies that include its bespoke models, and dedication to its R&D&i operations in the field of data gathering and processing, and machine connectivity. Agme’s corporate mission to become a global supplier of comprehensive automated solutions for the automotive components industry has helped to consolidate the com-

pany’s presence abroad, where it has secured contracts in Mexico and China. In Mexico, it has entered into several projects for the development of bespoke machines for the assembly of battery components for Tesla cars, using riveting technology, as well as special equipment for machining the headtubes on that make of cars. Delivery is scheduled for August and December this year. With a view to providing fully integrated projects, from the drawing-board to commissioning on the customer’s premises, Agme



Special Agme machine for making headtubes.

has diversified its range by enlarging its catalogue of automation technologies, hitherto centred on assembly processes and related technologies, such as riveting, pressing, stamping, control and other forming

processes. It now also provides customised solutions that include machining technologies such as drilling and die-cutting, adapting to its customers’ technical requirements in production.

DELTECO COMPLETES THE MOVE TO ITS NEW HEADQUARTERS

Delteco is climbing up the table in the design of integral machining solutions thanks to Delteco Robotics



Lehendakari Urkullu and the leader of the provincial council Mr Olano attended the launch of the new plant in Zumaia.

At the end of October 2019, Delteco, the leading MT retailing group in Spain, convened a large group of customers and delegates from the companies it represents at the official opening of its new headquarters in Zumaia in the Basque province of Gipuzkoa. The event was attended by

the Basque First Minister, Lehendakari Urkullu, and the leader of the provincial council of Gipuzkoa, Markel Olano; leading delegates from AFM; more than two hundred customers and friends; and senior executives from the companies this Basque group represents: Correa, Doosan, Quaser, Hermle, Sodick, Gentiger, Wele, Vision Wide, Kent and Burkhardt + Weber. Delteco's chairman, Xabier Aranbarri, used his speech to highlight the values in-

culcated by the company's founder, Esteban Aranbarri, which "for 50 years have been those of a family firm and which govern the business; and the priority given to customer service". These principles are now fostered from the Zumaia plant, which provides "greater training capacity, as it has more dedicated premises, an improved service, a stock of 50 machines for streamlining our response to demand, and the development of bespoke solutions. It is no co-

DESIGN OF INTEGRAL MACHINING SOLUTIONS FOR GAME AND EGILE MECHANICS

incidence that we are the sole retail company nationwide with its own engineering division with this level of expertise". Now that it has completed the move, Delteco's mission focuses one of its lines of action on boosting its robotics division. The automation of MT processes is undergoing sharp growth, as Aranbarri stresses, so the company is rolling out a scheme to hire staff that will increase the unit's headcount over the coming months. A highlight among Delteco Robotics' latest developments involves two cells for the Galicia-based machining firm Game, together with the solution created for Egile Mechanics, integrating Doosan lathes and Fanuc robots. The new opportunities Zumaia provides have also led to a greater diversification of its range, which was reinforced in 2019 when the company became the dealer in Spain for Vision Wire, a Taiwanese maker of gantry milling machines. This new arrangement led to the provision of seven machines until September 2019 for projects involving Gestamp, Met Meka and Talleres Lemu. Delteco has also secured orders for five-axis machines with the German firm Hermle for aeronautical companies such as ITP and Aciturri.

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MT in Empresa XXI | News from Sector Leaders

Fagor Arrasate, a company specialising in the manufacture of machine tools for forming, plans to open its fifth Service plant in the world in Chicago's metropolitan area. The new plant is expected to be up and running in the second half of the year near its US sales delegation located in Willowbrook, in the State of Illinois, which has been operating since 1990.

The strategy involves reinforcing the Service segment in order to be closer to its main markets and customers. This explains the boost given in recent years to the opening of premises of this nature.

The US is considered a strategic market because of its automotive industry. The Service centre will be responsible for maintaining its machines, supplying spare parts, and the retrofitting service. The Chicago plant will join the group's network that consists of the centres in Mondragón, which was the first to open, Kunshan (China), in 2008, and Hilpoltstein (Germany) and Querétaro (Mexico), in 2017.

This year, too, Fagor Arrasate has launched a project that has meant a major cost-saving in the manufacture of carbon fibre reinforced polymer composites (CFRP) for automotive parts, involving the Compression Resin

FAGOR ARRASATE TO DEPLOY ITS *SERVICE* MODEL IN CHICAGO

It is also making significant cost-savings in the manufacture of car bonnets for Maserati with CRTM technology applied to composites

SERVICE CENTRES PROVIDE DIRECT SUPPORT FROM CHINA, MEXICO, GERMANY AND SPAIN



Hot-stamping press under construction at Fagor Arrasate's facilities.

Transfer Moulding (CRTM) process. This has reduced costs by 10-15% compared to the HP-RTM method, and by 20-30% for prepreg parts involving

the autoclave process. Fagor Arrasate has conducted a full breakdown of the CRTM process and the material involved with a view to understanding and

defining the key parameters, real cycle times and the necessary equipment. This work has been applied to a real class A car bonnet for Maserati.

FRESMAK INVESTS IN PEOPLE, EFFICIENCY, OPERATIONS ABROAD, AND R&D

Fresmak is addressing four main pillars in its development: first and foremost are people, followed by process efficiency, the expansion of its international market, and R&D. The company's management considers that efficiency involves a reappraisal at all levels, from the adaptation of its facilities through to the reorganisation of its human resources, including a new design of the layout for production storage and logistics.

The refurbishment of its premises, which cover a

ITS REMIT IS TO INCREASE ITS PRODUCT RANGE WITH SMALLER BATCHES

surface area of 3,000 m², has involved revamping the offices and incorporating new machinery and equipment, according to the parameters defined by the SMED and Lean Manufacturing concepts, in line with the automation of machining processes and a reduction in times, advancing toward a broader product range with smaller batches, while upholding efficiency.

A modern chemistry laboratory and an electronic testing facility, currently at the project stage, complete the centre's reorgani-



The new chemistry laboratory will boost its R&D strategy.

sation stage, with the latest inclusion being a three-headed inside and outside grinding machine. These steps will boost the advance toward Industry 4.0. The company is work-

ing on the incorporation of bluetooth sensor and monitoring technologies for attachment systems in the machining process, which will improve a part's traceability.

IBARMIA ROLLS OUT AN INTENSIVE R&D PLAN



Machine built by Ibarmia with similar specifications to the one delivered to the German group Wahl.

It is taking another technological step forward in multiprocess machines by introducing grinding

Ibarmia Innovatek has drawn up its 2020-2022 strategic plan for furthering “the design of more sophisticated equipment with improved features, as requirements that the market never ceases to expect”, in a statement made to Empresa XXI by its CEO, Koldo Arandia. To achieve this goal, the company will set “a high pace in R&D&i”, a task that will involve spending over a million euros per year. The plan will therefore be based on a commitment to innovation, which in 2019 meant launching four Hazitek plans sponsored by

**CONTRACTS
SUBSCRIBED WITH
ANDRITZ AND
GERMANY'S WAHL**

the Basque Government (Multione, MaddTwin, Madinet and Abio); with a further seven schemes being introduced this year. Ibarmia’s Head of R&D&i, Arrate Olaiz, stresses that the work focuses mainly on embedding new processes on the machines and their guaranteed precision. Accordingly, Ibarmia will be attending AMB and BIEMH to showcase the grinding module it has developed and finetuned with Hazitek Multione. This system, which is now available on all its machinery, “attains a high surface quality” and “incorporates technology that overcomes the problems of working with milling and turning chips, as well as grinding ‘mud’, thanks to the experience we have acquired in the treatment of dust in ad-

ditive manufacturing”. Other lines of research focus on controlling the additive manufacturing process for usability and CAM; increasing precision and creating a digital twin in

sion. Intensive work is also being carried out on digitisation projects for designing an app that facilitates the use, cybersecurity and monitoring of machines, as well as the design of a multiblade system for automating its T series, which is to be presented in Stuttgart and Bilbao. Arrate Olaiz stresses that the next objective will be “the introduction of machine-mounted measuring”. The impact of their product range has been confirmed by the orders placed by the Austrian firm Andritz, for the delivery of the third Series Z machine to a French subsidiary, and by the capture of the German firm Wahl as a new customer, with the installation of a Serie T with a six-blade manager.

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R&D projects
focus on innovation
over the period
2019-2020

machinery for aeronautics to reduce programming and installation times; besides working on machine and ambient temperature control for managing these factors and ensuring the equipment’s optimal preci-



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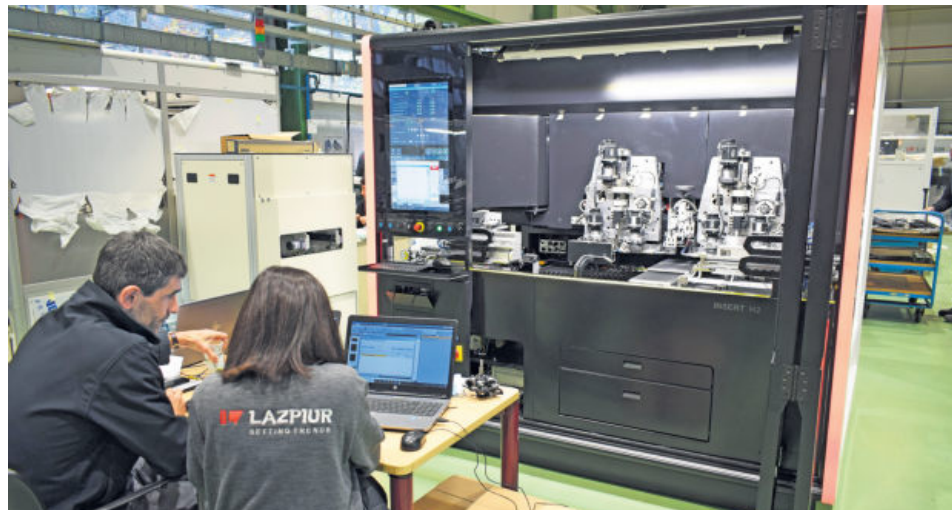
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MT in Empresa XXI | News from Sector Leaders

In 2020, Lazpiur has celebrated 105 years of trading. This company, headquartered in Bergara, has made the most of this milestone to take another step forward in its industrial operations. The family's fourth generation has embraced the management of a project whose remit is to strengthen the 'Lazpiur' brand with new ranges of its proprietary product and refreshing its image and means of production. The 2020-2022 Plan is not, however, turning its back on the company's past, but instead is seeking to "exploit the 'Lazpiur' brand and boost it", as stressed by the group's CEO, Ander Aramburu.

The greater effort in investment will involve transforming the industrial model and the specialisation of its two plants in Bergara, in the Basque province of Gipuzkoa. The headquarters, with an indoor area of 3,000 m², will house all the administrative and engineering departments and two machine testing and assembly lines, along with an area set aside for the 'Lazpiur Museum'.

The Malatu plant, with an indoor area of 5,000 m², will hold all the machining sections and the R&D department. Besides having a new layout, the operation will pave the way for the workshop's technological update. As Ander Aram-



The company has embarked upon a project for enlarging and specialising its centres in Bergara.

LAZPIUR IS MOBILISING ON ALL FRONTS

The 2020-2022 plan considers steps in investment, new product ranges, and brand strengthening

buru notes, "we will be raising the level of automation and taking the necessary steps to create a 'smart factory' with a multipurpose workshop with over thirty machines that will be reinforced with

five-axis centres, multi-tasking centres, lathes and three-dimensional units. The next investment chapter will focus of forming a cell for extending the company's diversification to the aeronautics sector, a

segment that will be assigned its own area in the plant. The equipment's specifications will be determined once the first production programmes have been drawn up".

A major transformation Nevertheless, and still according to Aramburu, they will be leading this major transformation in the field of machinery, where they will be reinforcing the portfolio of machines for automotive electronics, as "it accounts for over 50 percent of turnover". The new technological status in this field has been confirmed "through the success achieved at the productronica trade fair in Munich", where the company has introduced its Insert H1 and Insert H2 solutions (two larger headstocks), which are scalable and provide a faster cycle, more versatility and polyvalence, a reduced size and improved ergonomics, besides being designed for embedding in digitisation and sensor pathways in Industry 4.0 solutions.

To complete the portfolio of machinery for electronics, in 2020 Lazpiur's research department is to undertake an R&D&i plan for creating a new solution to complement the previous one by automating the tasks of inserting electronic components in connectors and their subsequent folding at different angles.

EKIN COMMITS TO INVESTMENTS AND DIVERSIFICATION IN ITS 2020-2021 PLAN

Ekin has drawn up its 2020-2021 plan focusing on growth in aeronautics and product diversification in the automotive sector. This cooperative manufactures tooling and machinery for broaching and laminating. It has earmarked over 2.5 million euros for investments in its 2020-2021 strategic plan.

At a time of considerable uncertainty in the automotive sector, Ekin has committed to a strategy that in the short term seeks operating efficiency, product/market development,

EXPENDITURE OF 2.5 MILLION EUROS FOR RAISING OPERATING EFFICIENCY AND CAPACITY

and knowledge/talent management through mainstreaming.

Within the project 'Lantegia Eraldatuz' (meaning Workshop Transformation in Basque), part of the investments will be used to improve efficiency by streamlining the layout and finetuning the flow and standardisation of production processes. Another part of the outlay will be used to increase capacity through the acquisition of new fine machining equipment for the plants in Amorebieta and Lemoa.



Ekin broaching machine at the Advanced Aeronautics Manufacturing Centre.

DANOBAT AND SORALUCE, IN SEARCH OF THE DIGITAL TWIN

An R&D project for finetuning the engineering processes linked to the design and commissioning of their machine tools



Danobatgroup seeks to improve the development process involving users.

Danobat and Soraluca, members of the Danobatgroup, together with the affiliate Sa-vvy Data Systems, have received support from CDTI for the

MOVICOMS project, involving the creation of digital twins of their machines. This initiative has been prompted by the existence

of new tools for the joint integration and testing of different components (electrical, mechanical, hydraulic and pneumatic design, and the software in-

terfacing with the system), creating a single virtual entity referred to as the physical machine's digital twin.

Within this context, MOVICOMS will focus on resolving the sundry issues of interoperability that arise in the process of creating a digital twin. Just as a MT may be considered a complex system, so too is the creation of a digital twin, and it requires the interplay between different modules to accurately reproduce the machine's behaviour. Hence the reason that the success of a digital twin is said to depend on the relationship between the effort made for its design and development and the saving achieved thanks to its use in a product's lifecycle.

Danobat and Soraluca expect to finetune the development processes, as the use of the digital twin will improve the interaction between the different areas of engineering. At the same time, this will provide for the end user's early involvement in the product acceptance process, thereby improving their experience, as well as boosting quality by reducing design flaws and guarantee costs. All this will lead to greater reliability and reinforce customer loyalty.

THE MOVICOMS PLAN FOCUSES ON RESOLVING THE ISSUES OF INTEROPERABILITY THROUGH THE CREATION OF A DIGITAL TWIN

MILLING MACHINE FOR MECVIL

Soraluce has built a moving column milling machine, with 16-metre longitudinal runs, a vertical displacement of 3.2 metres, and sideways movement of 1.6 metres, for the Catalan company Mecvil, which will be using it in the machining of parts for the railway and aeronautics industries. This equipment can include several work stations (baseplates, rotating tables, roto-translating tables, etc.). In this case, the machine has two stations and a pendular option for machining and loading parts at the same time.

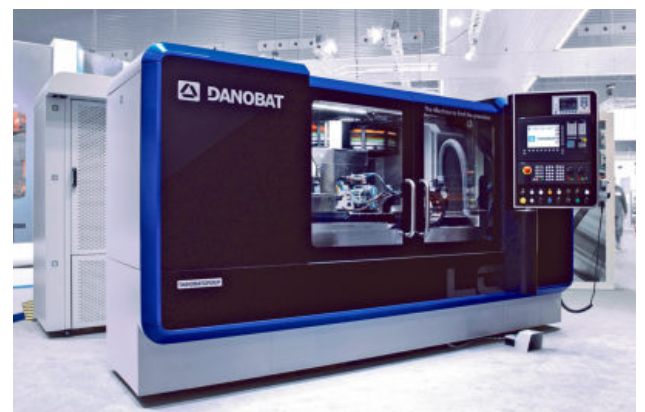


View of the industrial facilities belonging to the company Mecvil in Barcelona.

DANOBAT ENRICHES ITS SOLUTIONS WITH PROPRIETARY SOFTWARE AND HEADSTOCKS THAT ENSURE PRECISION REQUIREMENTS ARE MET

GRINDING FOR HYPERION

Danobat-Overbeck has developed a turnkey high-performance, flexible grinding machine for responding to intensive levels of production for the manufacturer Hyperion M & T. The project has contemplated all the stages in the process, from preliminary engineering through to the design of maintenance strategies and after-sales support. The solution also includes the company's own headstock and software, as critical components for guaranteeing the required precision.



Danobat LG-1000 high-precision grinder.

MT in Empresa XXI | News from Sector Leaders

TDG COMPLETES ITS CATALOGUE OF CLAMPING SOLUTIONS

Development of a project with the machine manufacturer GMTK, which cements its position in customised chuck changers

TDG Clamping Solutions, maker of large-size manual and automatic lathe chucks, has reached several milestones within the framework of its strategy for furthering the development of clamping solutions and the provision of a comprehensive portfolio.

This company is involved accordingly in a project for the wind-energy sector that involves the supply of a fully automated cell consisting of three multi-process lathes. GMTK Multi-Process Machining is responsible for manufacturing the lathes, while TDG is undertaking the chucks, with a linear changer comprising fourteen made-to-measure chucks of more than two metres.

Through this development, TDG has consolidated its position in this market, following the delivery of several roto-pallet units, with a simple design, with a capacity for only two chucks, yet at the same time of considerable use for improving process times in multi-brand vertical lathes.

With a view to advancing in this field, TDG has gradually reinforced its technical capabilities and processes, and it has recently launched a plan for process improvement by the hand of Sisteplant, which will run through to 2020, giving rise to new investments in machinery in 2021.

In addition, TDG has received another order for the delivery of a chuck changer to a major European valve manufacturer. The daisy-chain model changer consists of a centring station, three stand-by positions and the lathe's own chuck. It will be fitted with several plain plates measuring between



TDG showcases a smart attachment plate at EMO, the first step in its commitment to Industry 4.0

1200 mm and 1400 mm. This arrangement optimises space and production in series and is the only one missing from

TDG's portfolio. These developments are the outcome of the new approach provided by the 2019-2021 plan, in which its remit is

to become a technological leader in the field of manufacturers of made-to-measure clamping solutions for special applications.

CARL ZEISS AND IDEKO ENLARGE THE ULTRAPRECISION CENTRE IN ELGOIBAR

The German multinational Carl Zeiss, specialising in the field of optics, and the Ideko technology centre have injected over a million euros to reinforce the human and production resources at their ultraprecision centre in Elgoibar (Gipuzkoa) and "continue to be Spain's benchmark R&D centre in measuring services and the high-precision control of machining". More than 30 companies have admired the new equipment deployed at the Zeiss-Ideko Ultraprecision Center during an open-day in which they have seen and tested the centre's different solutions in metrology and microscopy, designed to improve quality control in the precision



Open-day organised by Carl Zeiss.

machining field within Industry 4.0. The ultraprecision centre in Elgoibar has around a dozen items of measuring and microscopy equipment, seven of which are

new, in an area covering 300 m². Following the last seven recruitments, the headcount now numbers 14 specialists, eleven of whom are technical and chartered engineers.

IT HAS ALSO DESIGNED A **DAISY-CHAIN MODEL CHANGER** WITH A CENTRING STATION, THREE STAND-BY POSITIONS AND THE **LATHE'S OWN CHUCK**

THE TWO ENTITIES ARE INJECTING OVER A MILLION EUROS IN ENLARGING THE CENTRE'S **CAPACITY**

Berkoa is to expand its catalogue of special machinery with a vertical lathe that it will be delivering at the end of September to the Gipuzkoa-based company Bellota Agrisolutions, one of the world's leading makers of farming machinery and spare-parts distributors. In keeping with its principles of flexibility and cutting-edge technology, Berkoa has designed a bespoke machine that caters for the customer's requirements.

Following the knowledge transfer involved, sources at the two companies have told us that the result is a turnkey machine for machining ploughing and sowing discs measuring between 250 and 800 mm in diameter. As these discs are so thin, the system for feeding the parts to be machined is based on pressure and friction.

Accordingly, the machine has a specially designed holder for this application, consisting of a pneumatic cylinder measuring 320 mm in diameter, which uses high friction sectors both on the headstock and on the holder itself to feed the discs into the machining process.

The design of this holder has two unique features: a flexible arrangement that absorbs any misalignments of the headstock due to differences in the raw part to be machined, and an automatic pressure adjustment

BERKOA CREATES A SPECIAL LATHE FOR BELLOTA

The turnkey solution will be used for machining discs for ploughing and sowing

**COLLABORATION
WITH IMH ON THE
DEPLOYMENT OF
MULTIPROCESS
MACHINES IN
FORMING**



Example of a ploughing disc for Bellota Agrisolutions.

system for pushing-attachment, depending on the size of the part to be machined.

The headstock part of the machine is extremely strong in order to withstand axial loads of up to

10,000 kg with a 37-kW motor. In order to bring the headstock to a rapid halt, it has two pneumatic brakes. This means shorter cycle times and enhanced safety. The machining process involves two tools at the same time. The machine therefore has two sets of crossed trolleys, one on each side of the headstock. A further feature that sources at Berkoa highlight is the cutting cooling system measuring 70 bar, as the lathe has a full complement of pumps, tanks for used and fresh coolant with 25-micron filters, etc. Ikasmak Project

The machine manufacturer, which has celebrated its fourth anniversary this year, is also currently involved in other interesting projects. One of these is at the design stage and involves rotary friction welding. Another one is being undertaken within the framework of the Ikasmak project. In this case, the cooperative is working with IMH in Elgoibar on the deployment of multiprocess machines in the forming sector, which involves speeding up the learning and integration process in a smart workshop environment.

Berkoa specialises in the design and manufacture of MTs, support services, maintenance and retrofit for sectors as automation, aeronautics and capital goods, among others.

CEVISA LAUNCHES THE CHP 60G INV BEVELLING MACHINE AND CONSTANT RADIUS J-SHAPED CHAMFERS

Castellano y Echevarria-Vitoria (Cevisa) has provided a foretaste of its plan for expanding its range of bevelling machines through the marketing of its new model CHP 60G INV, which is designed to perform lower bevels on large thickness sections and very hard materials, such as Hardox and Duplex, providing a machined finish. It is specifically designed for making bevels of

up to 60 mm in length on steel sections measuring between 4 mm and 100 mm. The CHP 60G INV integrates seamlessly in the programme with the CHP 60G bevel milling machine, which has the same specifications, with the exception being that it makes the bevels on the upper part of the steel section. Cevisa has also designed another innovation for responding to its customers'

requirements with a solution for producing J-shaped chamfers.

The device is now fully operational following the completion of its trials and successfully meeting a customer's specific requirements. The bevel radius is applied solely to J- or U-shaped chamfers. Normally, the arrangement of a J- or U-shaped bevelled welding is determined by a chamfer (or bevel) angle



Cevisa also optimises the welding process with its J-shaped chamfer.

and a chamfer radius. The device provides a fixed, constant 8 mm radius. The welding designer may choose the one that best suits their requirements.

MT in Empresa XXI | News from Sector Leaders

GOIALDE GROWS IN MTS AND HYDRAULICS

The operation compensates for the lack of vigour recorded in the automotive market and prompts new investment programmes in machinery, robotics and Industry 4.0

In 2020, the Goialde Group, specialising in the co-engineering, manufacturing and supply of turnkey machining solutions, will fulfil the main goals set forth in its sectorial customer diversification plan. Its CEO, Mikel Basterretxea, has told Empresa XXI about the preparations for the launch of the industrialisation of several projects for its customers that build large items of hydraulic equipment, and its good sales performance in the machine-tool sector, which it provides with very high precision stippling. These steps have helped to offset the lower dynamism of the car industry. Furthermore, the plan will also involve the diversification of long-term risk and pre-empting the structural change in car drive systems; a segment that accounts for the bulk of the programmes for this sector.

GOIALDE PRECISION

The sectorial transition is being underpinned by a major effort in marketing, engineering and investment, with an outlay of over four million euros in equipment over the period 2019-2020. These funds have been focused on the purchase and commissioning of new production cells for hydraulics, while the priorities in 2020 will be to expand Goialde Precision's capacity, with work being performed mainly for MT and aeronautics firms, continuity of the robotics programme in operations, and, at the same time, the implementation of greater capabilities in Industry 4.0. According to Basterretxea, the positive level of demand recorded by the MT sector in 2018 and 2019, which now accounts for 15 percent of the group's turnover, has provided the impetus for deploying new resources in its air-conditioned facilities for precision work. Specifically, it has reached



Goialde Precision extends its capacity following the positive response received in the MT sector.

an agreement to incorporate a Dixi machine with a 1000 mm x 850 mm bench, which is expected to come into service in 2020, and a

Mori Seiki horizontal centre with a 630 mm bench. Following this investment, Goialde Precision will have four Dixi machines

for the finish on the parts deburred by its three Mori Seiki centres, which will increase this department's capacity by more than 25 percent.

Automation

The second line of investment will be focused on the automation of Goialde Components processes. The plans include the mounting of robots on two cells, one specialising in parts for its hydraulics customer Danfoss, and the other dedicated to the car segment.

This plan is to be complemented by the extension of Industry 4.0 systems that will improve the management of production means and the application of a "more preventive and less reactive maintenance model", in Mikel Basterretxea's words.

SIDEPALSA FURTHERS THE CUSTOMISATION OF ITS AUTOMATIC CHANGERS

The Bizkaia-based company Sidepalsa, with a 40-year track record in automation engineering for machine tools, is working on a series of projects designed to provide a higher value-added offer and reinforce its industrial capacity.

The planned actions involve boosting the engineering department, which will mean a greater capacity for customising its products and intensifying its R&D operations, the brand's consolidation on the international market, and the undertaking of a programme of investments for modernising and optimising its industrial performance.

**THIS INNOVATION
HAS BEEN USED TO
BRING ON BOARD
THE GERMAN
COMPANY STARRAG**



Sidepalsa is rolling out R&D plans for creating more complex products.

As an example of Sidepalsa's technological progress, a highlight has been the market launch of an automatic changer for 250 tools of up to 70 kilograms. The difficulty facing these solutions involves conflating weight with speed and acceleration. The design of this equipment provides for a displacement speed of 90 m/min and an acceleration of 5 m/sg², and also includes an 'in process' cleaning system. This equipment has meant

that the company's customer portfolio now includes the German machine-tool manufacturer Starrag, which was brought on board at the last AMB trade fair in Stuttgart.

Following the trialling of the first changer, the German firm has placed new orders. This commercial impact is expected to increase shortly if negotiations are successfully concluded with other international manufacturers.

COMETEL BOLSTERS ITS EQUIPMENT AND COMMITS TO DIVERSIFICATION

It manufactures two lines for Gestamp and is putting the finishing touches to an original solution for upgrading machine shavings from the aeronautics sector

Cometel specialises in the design and manufacture of smart solutions for the transport and processing of shavings, chips and waste in general from industrial and recycling processes, and its 2020-2022 plan has established that its objective is to further its mission of “being acknowledged as a great and excellent firm”, in the words of its CEO, Sandra Montes. This goal is to be achieved by taking measures on different fronts with a view to consolidating a more participative management model and business diversification.

As Sandra Montes explains, the main lines of action will focus on “recruiting professional profiles of the highest level, with the aim being to reinforce the plan for increasing the number of projects with major customers”; and boosting the firm’s commercial effort to increase its



New line designed and built by Cometel for the aeronautics sector.

market share in Europe and Morocco, which will complement its good positioning in the Americas, especially Mexico.

These lines will also have an impact on the generation of a more potent catalogue for its traditional car sector and for new target areas, such as aeronautics

and energy; while its Recycling division will orchestrate measures to secure complete turnkey projects involving proprietary designs and possible partnerships with other companies in the sector.

Cometel’s CEO stresses that the plan upholds the pursuit of “The New Cor-

porate Culture’ we have been working on for the past four years”, and the development of in-house talent, which will be joined by other lines of action related to the digitisation of all processes and continuity in the competitiveness plan.

A highlight on the commercial side involves the orders with Gestamp: two lines for stamping waste for subsidiaries in Morocco and India, which articulate specific extractions and avoid metal contamination through automatic processes that separate steel/aluminium and aluminium from different alloys and steel.

INTEGRAL LINE

Cometel has also dedicated its expertise to the creation of an innovative solution that is to be installed at a major Spanish aeronautics company. The automated line, consisting of seven stations and running to fifteen metres in length, includes systems for shredding, centrifuging and classifying sundry materials generated during the machining process. In the casting and machining sector, Cometel’s portfolio contains two projects for Mexico. These lines will be designed for the practical articulation of an automatic ‘closed cycle’ system for collecting shavings, and the selection, preparation and drying of material for feeding into the casting cycle.

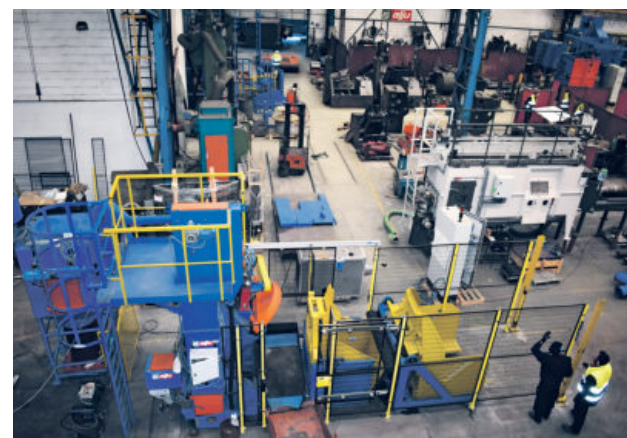
ALJU IMPROVES THE COMPETITIVENESS OF ITS PROCESSES WITH ANTIWEAR MATERIALS

Alju is undertaking an innovation project with a view to continuing to improve its shotblasting equipment in order to bring it in line with new technologies and advanced materials, increasing the competitiveness of its processes and reducing costs. The project is designed to improve the antiwear properties of the blades on turbine-powered shotblasting machinery, as indicated for all kinds of parts and surfaces, in terms of the cleaning, durability

and reliability of the blades, with less vibration. As sources at Alju have explained, the integration of new ICTs and data analysis are necessary for tailoring the shotblasting process to suit each customer’s requirements, furthermore providing a new servitization line; in other words, developing competences for providing services and solutions over and above the capacity for manufacturing a product. The aim is therefore to improve the performance and

quality of industrial operations, efficiency, and extend the useful life of the equipment supplied.

Within this framework, and with Tecnaia’s support, Alju has developed a new material for the industrial manufacture of turbine blades, using liquid metallurgy in a shell-mould casting process. The new material developed is based on research into the alloyed steels already being used, as well as on extreme applications subject to high stresses



Alju is developing ICTs and data analysis for its shotblasting lines.

and wear through abrasion, such as Ni-Hard materials. The company plans to start using the new material for turbine blades over the course of this year.

MT in Empresa XXI | News from Sector Leaders

IZAR SETS NEW GOALS FOR 2022

Increase capacity, finetune processes, renew machinery and grow in the field of hardmetal

Izar Cutting Tools is embarking upon an ambitious four-year plan, as the outcome of a far-reaching strategic conversation that has involved over 30 people in the organisation, as well as delegates from its customers and suppliers.

The Bizkaia-based manufacturer is to invest nine million euros in finetuning processes and purchasing equipment, in line with Industry 4.0 parameters, and responding to its positioning in the European market, which receives 60 percent of its exports. Its turnover may well exceed 37.5 million euros in 2022, 20 percent more than in 2019. The plan is rounded off with the launch of an in-house talent development programme and new recruitments that will strengthen the technical-sales department.

PRODUCTION AND LOGISTICS

The main strategic axis will revolve around the steps taken to transform production and logistics processes. According to the premise of Lean Manufacturing, the rearrangement of the stages in the production process is prompting the redistribution of capabilities and the refreshment of cylindrical grinding, which will involve retrofitting 24 grinding and grooving machines.

A new lean cell, with six machines for making milling cutters will provide greater flexibility, reducing product seasoning time and increasing capacity.

IMPACTING UPON
THE AEROSPACE
INDUSTRY HAND-IN-
HAND WITH THE
AERONAUTICS
ADVANCED
MANUFACTURING
CENTER

IT HAS SET ITS
SIGHTS ON
INVOICING
20% MORE IN 2022
THAN IN 2019



Its fourth automatic vertical warehouse will double its palletising capacity.

Nevertheless, the strategy in grinding signals a realignment towards the use of smaller and less automated machines, favouring the flow of parts and the making of short series, optimising output and product quality.

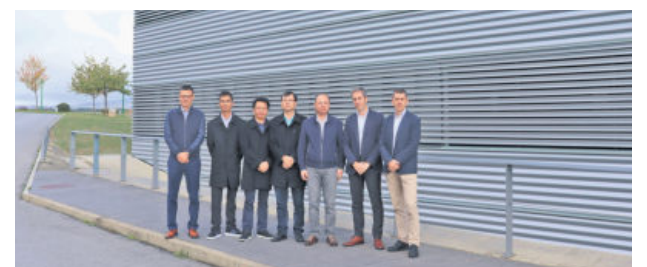
Innovation will be another mainstay, in line with the company's deployment in the segment of hardmetal

cutting tools for machining aluminium, stainless steels, composites and new materials, which will require incorporating technologies for their use on large machining centres. This new field provides the setting for the alliance with the Aeronautics Advanced Manufacturing Center (CAFA), in which it is involved as a partner in

a three-year project for investigating 3D printing technologies, such as selective laser melting and metal deposition by laser in the manufacture of small parts for aeronautics. The project involves testing the tools designed by Izar for conducting a study on the drilling, reaming and milling of the parts.

LANTEK INTRODUCES MORE THAN A HUNDRED IMPROVEMENTS AND UPDATES IN ITS 'VERSION 40'

The Araba/Alava-based company Lantek has launched Version 40 of its software solutions through the incorporation of more than 100 improvements and updates. Lantek's CTO, Carlos García, has highlighted that the innovations have affected the use of the remote control and teleworking, providing "a huge step forward in the design, installation and set-up of machines without the need for technicians to be physically present, besides catering for different configurations so that machining, production planning and budgeting teams can work from home". Version 40 also includes new developments focused on the efficiency of manufacturing output, such as the avoidance of collisions in the cutting process and an al-



Arrangement of incorporation of its software on HSG cutting machines.

gorithm for efficient waste disposal in pipe cutting. This last function is included in Lantek Expert, which has 34 new features for maximising productivity and efficiency, while at the same time improving the usability of all the functions related to attachments (or micro-cuts) or the introduction of automatic marking for optimising process management. As regards Lantek Flex3d,

it finetunes pipe cutting to avoid collisions and applies a new algorithm that disposes of the waste generated when cutting holes. These new features also extend to Lantek Integra and Lantek Manufacturing Execution System (MES) software with, among others, a new interface, control panels with advanced statistics, and the real-time generation and display of graphics.

Technology | Machining

TECNALIA IDENTIFIES AREAS OF STABLE MACHINING

Design of theoretical and experimental models for avoiding vibrations and premature wear on cutting tools

As part of the 'SmaPro' project backed by the Basque Government's El-kartek programme, Tecnalía has designed new theoretical and experimental models of machines, components and production processes that will enable the manufacturing sector to identify stable machining areas that avoid vibrations and premature wear on cutting tools, while recording a more than 20 percent reduction in the time devoted to ancillary operations, such as the positioning and measuring of the geometry of parts during their manufacture.

Thanks to this development, manufacturing firms will be able to act quickly and flexibly to deal with any non-compliance detected in the different production stages, thereby



Tecnalia will be reducing the times for ancillary tasks.

avoiding faults, defects and quality shortcomings during production. Furthermore, it will help machine tools to become increasingly more autonomous, smarter and easier to use, thereby entailing manufac-

turing processes that are more productive, more efficient, and more precise. Tecnalía has already implemented this technology in an artificial vision system, which it has mounted on a multiprocess machine

operated by Ibarria in Zamudio. This will provide the company with accurate data on production figures during the operating stage, which will lead to the design of machines that adapt to those parameters. This development will mean a more than 10 percent reduction in the time required to display a machine's modal performance, and will provide end users with the option of conducting simulations of manufacturing processes during the preparation or launch stages of a production process.

Besides Tecnalía, the 'SmaPro' research project involves Tekniker as coordinator, Ideko, Azterlan, Lor-tek, Aotek, Mondragon Unibertsitatea, and the University of the Basque Country (UPV/EHU).

THE RESULT WILL BE A **20% REDUCTION** IN THE TIME DEVOTED TO ANCILLARY OPERATIONS

IT HAS MOUNTED ITS TECHNOLOGY ON A **MULTIPROCESS MACHINE AT IBARRIA**

CEIT INVESTIGATES THE REPLACEMENT OF COBALT BY AGE-HARDENABLE ALLOYS

The Ceit technology centre is committed to the improvement of materials for the Basque machine-tool sector after investigating the replacement of cobalt by age-hardenable alloys, which may be used in a wide range of applications, such as cutting tools, civil engineering, and stamping and mining tools.

Considering that the alternative materials to cobalt are not hard enough without additional treatment, the alloys designed need to be hardened through some form of process. As sources at Ceit have explained, this involves a similar strategy to the one applied to the Ni

TO BE USED IN A WIDE RANGE OF APPLICATIONS, SUCH AS **CUTTING TOOLS**

superalloys used on the components in aircraft engines.

Age-hardenable alloys are more resistant to wear in applications involving high-temperature operations, such as the hot-rolling of steel, as it remains hard 200°C above standard WC-CO alloys.

With a view to developing alternatives to these WC-CO alternatives, the centre is combining thermodynamic simulation processes and experimentation (complex thermal testing) and techniques of high-resolution microscopic observation. Micromechanical testing allows measur-



Tools made of this material withstand 200°C more.

ing the resistance of the joint between the WC and the metal, and generating models for microstructural improvement. One of the project's key aspects is that whatever is designed needs to be industrially scaled up, which means that laboratory-scale processes need to be assessed in order to

detect any risks that may be involved in industrial equipment.

According to Ceit, these alloys will lead to a 50-80% reduction in cobalt content, being very close to this latter figure in the case of cutting tools, which account for 70% of the market in hardmetal tools.

Technology | Artificial Intelligence

IKERLAN: ARTIFICIAL INTELLIGENCE FOR CONTROLLING PRESSES

The centre is working with Fagor Arrasate on the control and automatic adjustment of stamping systems based on new AI algorithms

Ikerlan and Fagor Arrasate are immersed in a project for developing new Artificial Intelligence (AI) algorithms for the control and automatic adjustment of stamping systems. Both the development and the early validation of the algorithms will involve the use of a digital twin platform that they have been building and finetuning in recent years. According to sources at the technology centre, this platform is designed to model and simulate hydraulic operating systems.

All the resulting technologies will be used for developing an innovative solution for controlling the power of hydraulic cylin-

**THE ALGORITHMS
WILL BE EMBEDDED
IN HYDRAULIC
PRESSES OF UP TO
3,000 TN**

ders, using Machine Learning Control techniques. As they have explained, they rely on a technique called Iterative Learning Control (ILC), an algorithm that learns from mistakes made in past repetitions and which adapts naturally to such a repetitive process, as in the production of large batches.

Based on this project, Ikerlan and Fagor Arrasate expect to develop ILC algorithms capable of learning from prior cycles and enabling the control system to automatically reduce the number of errors made, besides adapting to any wear on hydraulic components. The benefits of including this type of AI on presses



The solution will reduce commissioning and maintenance costs.

are an improvement in a machine's dynamic specifications through faster adjustment and less overshoot regarding instructions. At the same time, it leads to less commissioning costs through automatic adjustments, as well as more economical maintenance, as it provides a mechanism for adjusting to

ongoing changes in the press's dynamic features. These new developments will be flexible, which means Machine Learning Control algorithms can be used on hydraulic presses of up to 3,000 Tn (TryOut, Composites, hot-forming), for six and eight passive-cylinder pads plus a double-action one of up to 600 Tn in power, and hydraulic pads for mechanical presses of up to eight double-action cylinders up to 600 Tn.

By the end of the year, they expect to have embedded their first models of real-time HW control and virtually validated them through hardware-in-the-loop (HiL) techniques.

TEKNIKER COMMITS WITH THE ERLO GROUP TO PREDICTIVE MAINTENANCE IN INDUSTRY 4.0

Tekniker has committed to the development of predictive maintenance technologies for the cloud storage of critical data on parts and components for the automotive and aeronautics sector, amongst others.

In observance of this strategy, it has worked with the Erlo Group, which specialises in high-output customised solutions in drilling and threading, in the design of a connected machine that integrates tech-

**ANOTHER LINE IS
DEDICATED TO THE
USE OF 3D PRINTING
FOR MAKING METAL
COMPONENTS**

nologies such as Big Data in order to gather information on the thread and thus oversee product quality. The machine is based on a thread-checking device that provides data that are accessible in the cloud and which can be monitored in real time.

Tekniker has also identified the manufacture of metal components through 3D printing involving the direct deposition of material in thread form, as a technology with future.



View of a multiprocess machine / TEKNIKER

Hence the reason it is working on the direct addition of metal material via laser (thread), referred to as laser metal deposition (LMD), from the perspective of the process and

the development of equipment. Its aim is to apply this additive manufacturing system in the aviation, aerospace, ship-building, wind and machine-tool sectors, among others.

Technology | Grinding

IDEKO: HIGH-VALUE ADDED GRINDING

The FAR project, in which Ideko is involved, is seeking greater precision, reliability and versatility

The FAR project was launched in 2018 to develop advanced grinding technologies in the fields of machinery, components, digital grinding and processes, in response to the new challenges arising in aviation, railways and automation. With less than half a year until the end of this Hazitek project, its performance will provide a major boost for the members of the consortium behind it, involving Danobat, Soraluece, Aotek, Fagor Automation, MYL, Ion-tech and, finally, Ideko, which is conducting the experimental trials on these developments at its BDIH node.

Within the field of processes, it has defined and tested the optimum conditions for treating alloys that are difficult to grind through the application of

new disc settings. A key part has involved the research conducted by Danobat and Ion-tech, with Ideko's support, and which in the future will allow selecting and defining the most suitable conditions for grinding materials and coatings with special requirements.



The Hazitek FAR project will be completed this year.

In terms of the machine itself, it has produced solutions for the thermal stability of grinding machines, optimising dynamic stability and developing settings that allow grinding operations to be included in multipurpose machinery. In the area of components, it has created monitored

grinding headstocks with operating capability (Cabezales CPS). They have designed solutions that accurately monitor the behaviour of hydrostatic headstocks for operating within the working parameters, and mechatronic systems for the rapid and precise changeover.

EMBEDDING A DIGITAL STRATEGY IN FIRMS

The FAR project consists of a block of technologies for digitising the grinding process, which include working on the development of specific solutions. One of the most important steps taken has involved the development of in-process non-destructive inspection techniques. Traditional non-destructive inspection technologies have

informed the creation of sensors and special focal laws that enable these technologies to be used during the grinding process, overcoming restrictions in terms of process times, physical accessibility, combination of processes and inspection quality. Sensors have been designed and algorithms created for experimental validation in this

final stage of the project. A further step taken has involved developing the advanced HMI platform. In cooperation with Fagor Automation and Danobat, and with the backing of Aotek and Ideko, an interface has been designed that covers the definition of the grinding cycles, which is very different to the programming of tools. This

involves the incorporation of the knowledge generated in the understanding of the special cycles developed in the first operating package, dedicated to processes. As sources at Ideko have explained, work has been performed on the graphic, semantic and connectivity aspects of HMI, both with operators and with other external systems.

LORTEK IS MAKING INROADS INTO LASER-BASED ADDITIVE MANUFACTURING THROUGH THE 'HYPROCELL' PROJECT

Metal additive manufacturing (AM) has attracted huge industrial interest in recent years. Nevertheless, the market for metal AM machinery is not yet competitive on a large scale, as the parts produced are much more expensive than those obtained by traditional means.

With a view to overcoming this barrier, four years ago Lortek launched the Hy-ProCell European project, which has just been completed this year with the development and validation of

embedded multiprocess hybrid cells for rapid, customised production using laser-based additive manufacturing (LBAM).

This has all been achieved within the context of the implementation of three industrial lines: two involving hybrid selective laser melting (SLM), specifically at the French company Poly-Shape and Spain's Ramem, and a third for hybrid laser metal deposition (LMD) processes at the Autodesk Technology Centre in the UK. Following the



Post-processing for SLM parts at Ramem / LORTEK

cells' trialling and testing at the end of 2019, Lortek has managed to implement industrial production cells focused on more flexible and re-adjustable LBAM processes, reducing the time required for new product development and manufacturing procedures. This, in turn, has reduced

downtime by 35 percent, decreasing the general costs of products made to order by up to 30 percent and broadening the range of products made by LBAM, besides improving data management and optimising the production cell's performance through data analysis.

Empresa XXI Reports | MT ranking in Spain

STOCK REMOVAL PROCESSES OUTPERFORM FORMING

Danobat, Soraluce, Correa, CMZ, Zayer, Ona, Ibarria, Juaristi, Geminis and Gurutzpe lead the charge in the upturn in sales in 2018, a year in which press manufacturers lose ground

Manufacturing firms in the sector for machine tools for metalworking and components, tooling and other systems and services posted a turnover of 3,463 million euros in 2018, 3.9 percent up on 2017.

The report drawn up by the Research Department at Empresa XXI, based on a cohort of 1,278 companies that filed their financial statements with company registers, reveals that 2018 was more positive for the large manufacturers of stock removal machines than for forming machines and those specialising in the automotive industry.

5.7%

profitability

among the 15 largest firms

In addition, the report shows that large companies have increased their share of the sector's turnover, and also that the ranking in terms of return on earnings is dominated by makers of tools and components and digital systems, rather than by large machine producers. The highlight of 2018 was the performance by manufacturers of stock removal machines -individual results, not consolidated ones, of companies domiciled in Spain-. Among the top 40 in the ranking, ten of the eleven firms involved in this activity increased their turnover by between 4 and 104 percent. The sharpest annual upturn was recorded by the Gipuzkoa-based firm Gurutzpe (+104%). It is interesting to note that the only firm in this group that recorded a fall in its turnover was Etxetar (-30%), Gurutzpe's parent company, impacted by its leading role in solutions for the

TREND IN SECTOR SALES ACCORDING TO COMPANY TURNOVER

COMPANY SIZE (by sales)	2018			2017			Dif. 18/17			2014		
	Number	Sales	Share	Number	Sales	Share	Number	Sales	%	Number	Sales	Share
Big (> 50 mill.)	15	1,216.60	35.1%	12	1,098.63	32.9%	+3	+117.97	+10.7%	7	678.49	25.5%
SME (< 50 mill.)	1,163	2,246.13	64.9%	1,146	2,235.64	67.1%	+17	+10.49	+0.5%	1,079	1,984.10	74.5%
Medium (50 - 10 mill.)	53	1,052.74	30.4%	50	1,055.57	31.7%	+3	-2.84	-0.3%	40	918.34	34.5%
Small and micro (< 2 10 mill.)	1,110	1,193.40	34.5%	1,096	1,180.07	35.4%	+14	+13.33	+1.1%	1,039	1,065.75	40.0%
Without activity	100	-	-	120	-	-	-20	-	-	192	-	-
TOTAL	1,278	3,462.74		1,278	3,334.28				+3.9%	1,278	2,662.59	

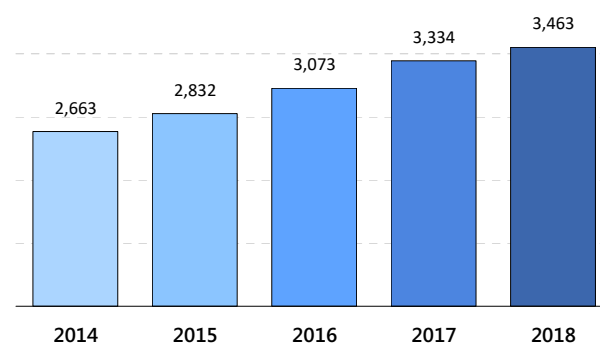
Figures in millions of euros. Prepared by EMPRESA XXI.

REGIONAL SHARE OF OVERALL SALES

REGION	Sales	% Spain	% Basque C
Basque Country	1,696.50	49.0%	100%
Gipuzkoa	1,269.35	36.7%	74.8%
Bizkaia	306.38	8.8%	18.1%
Araba	120.77	3.5%	7.1%
Catalonia	664.69	19.2%	
Navarre	227.90	6.6%	
Castilla & Leon	213.87	6.2%	
Valencia	160.97	4.6%	
Madrid	155.67	4.5%	
Other	343.14	9.9%	
TOTAL	3,462.74	100%	

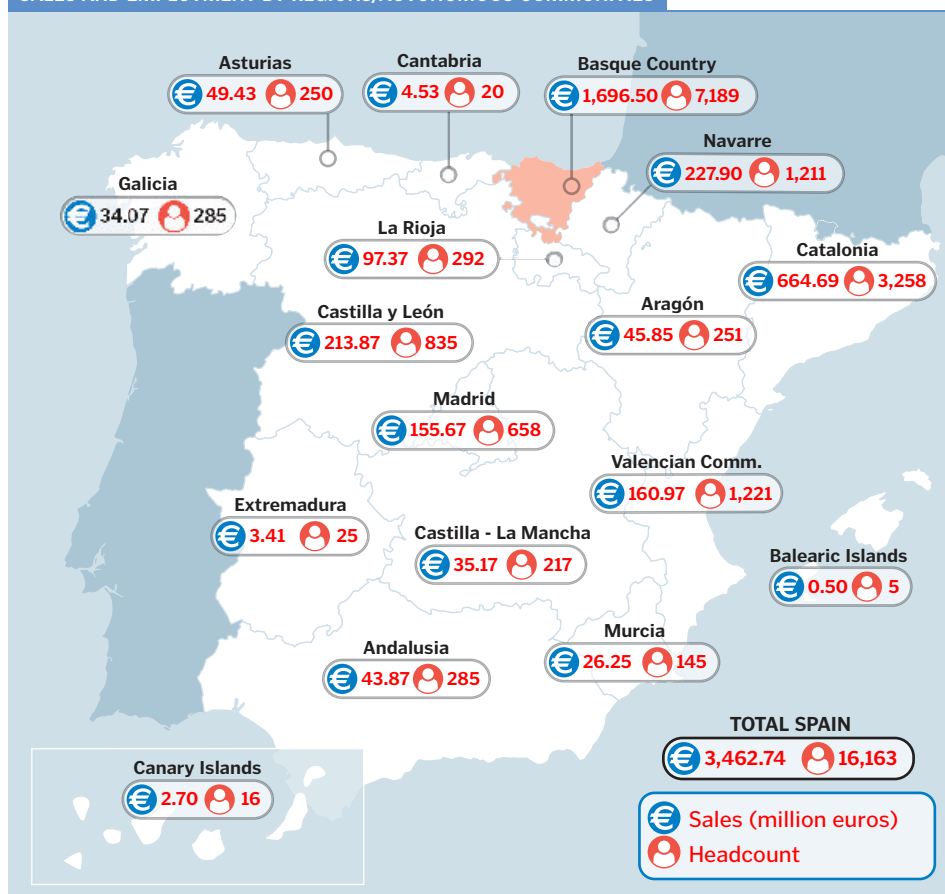
Figures in millions of euros. Prepared by EMPRESA XXI.

TREND IN AGGREGATE SALES



Figures in millions of euros. Prepared by EMPRESA XXI.

SALES AND EMPLOYMENT BY REGIONS/AUTONOMOUS COMMUNITIES



Figures in millions of euros (sales) and units (headcount). Prepared by EMPRESA XXI.

automobile sector, which has begun to rein in its investment cycle.

All the other major manufacturers of centres, lathes, milling and grinding machines have fallen in line with the cycle, with increases being recorded by Juaristi (+39%), Correa (+26%), CMZ (+19%), Geminis (+17%), Soraluce (+14%), Zayer (+12%), Ona Electro-erosión (+11%), Danobat (+5%) and Ibarria (+4%), which may also include Lagun (+20%), although it is back in 63rd position.

By contrast, forming companies were impacted by the sluggishness of the automotive industry: Fagor Arrasate (-6%), Nidec-Arisa (-9%) -the only large MT company with foreign capital, Japanese- and Loire (-20%).

As an exception within the group of press manufacturers, the Rioja-based firm Marzola and its parent company in Gipuzkoa, Biele, increased their turnover by 17.4 and 16 percent, respectively.

Under the heading of performance, the sector recorded a profit of 5.8 euros for every 100 invoiced in 2018. This figure amounted to 5.7 percent for the fifteen largest companies. Highlights were the balances posted by Abrasivos Manhattan (32.4%), J. Bocanegra, Shuton, and Lantek Sheet, attaining levels that were emulated solely by the machine manufacturer Etxetar. Finally, between

THE 30 LARGEST BASQUE FIRMS INVOLVED IN MTS FOR METALWORKING

COMPANY	Province	Year of build	SALES				Results		Web
			2018	2017	2016	%18/17	2018	Workforce	
FAGOR ARRASATE SC	Gipuzkoa	1957	205.60	218.52	202.49	-6%	2.48	676	www.fagorarrasate.com
DANOBAT SC	Gipuzkoa	1966	112.56	106.72	139.19	+5%	10.30	421	www.danobat.com
LOIRE SA FRANCO ESPAÑOLA	Gipuzkoa	1962	77.77	97.55	83.30	-20%	3.24	170	www.loire.gestamp.com
SORALUCE SCL	Gipuzkoa	1962	77.20	67.58	57.21	+14%	5.02	241	www.soraluce.com
ETXE TAR SA	Gipuzkoa	1966	61.83	88.49	n/a	-30%	11.57	158	www.etcx-tar.com
CMZ MACHINE TOOL MANUFACTURER SL	Bizkaia	2014	55.71	46.63	39.91	+19%	3.94	46	www.cmz.com
BIELE SA	Gipuzkoa	1982	54.05	46.40	45.48	+16%	1.85	217	www.biele.com
FAGOR AUTOMATION SCL	Gipuzkoa	1981	51.25	53.49	48.40	-4%	0.98	345	www.fagorautomation.com
GOIZPER SC	Gipuzkoa	1961	39.02	39.96	36.96	-2%	1.99	-	www.goizper.com
MONDRAGON ASSEMBLY SC	Gipuzkoa	1988	n/a	38.24	18.86	-	-	-	www.mondragon-assembly.com
ZAYER SA	Araba / Álava	1957	35.87	32.03	34.26	+12%	2.28	143	www.zayer.com
ONA ELECTROEROSION SA	Bizkaia	1980	32.70	29.52	27.78	+11%	2.91	128	www.ona-electroerosion.com
IBARMIA INNOVATEK SL	Gipuzkoa	2006	31.40	30.13	30.95	+4%	1.47	82	www.ibarmia.com
IZAR CUTTING TOOLS SAL	Bizkaia	1997	29.23	28.29	25.72	+3%	2.29	214	www.izartool.com
EKIN SC	Bizkaia	1962	28.30	25.54	22.45	+11%	-3.14	222	www.ekin.es
GAINDU SL	Gipuzkoa	2009	26.65	22.56	22.36	+18%	3.59	51	www.gaindu.com
XUBI ENGRANAJES SL	Gipuzkoa	2003	25.89	21.44	21.36	+21%	0.94	98	www.xubi.com
BOST MACHINE TOOLS COMPANY SLU	Gipuzkoa	2012	n/a	n/a	23.55	-	-	-	www.bost.es
JUARISTI BORING & MILLING MACHINES SL	Gipuzkoa	1994	22.33	16.04	18.29	+39%	0.53	71	www.juaristi.com
GEMINIS LATHES SA	Gipuzkoa	1994	19.77	16.91	19.55	+17%	-0.01	91	www.geminislathes.com
CONSTRUCCIONES MECANICAS JOSE LAZPIUR SL	Gipuzkoa	1965	19.75	17.71	15.50	+12%	0.98	101	www.lazpiur.com
GURUTZPE TURNING SOLUTIONS SL	Gipuzkoa	2012	17.65	8.65	10.05	+104%	0.36	54	www.gurutzpe.com
MTE-MACHINE TOOL ENGINEERING SA	Gipuzkoa	1994	16.67	17.33	13.34	-4%	0.65	35	www.mtemachine.com
ATHADER SL	Gipuzkoa	1992	15.42	15.32	10.37	+1%	0.56	26	www.athader.com
ALBA-MACREL GROUP SL	Bizkaia	1998	14.76	8.25	7.40	+79%	-0.56	80	www.alba.es
PUNTEADOS DE PRECISION GOI ALDE SL	Gipuzkoa	1982	14.01	12.78	11.14	+10%	0.81	95	www.goialde.com
SHUTON SA	Araba / Álava	1975	13.45	10.49	8.66	+28%	3.49	66	www.shuton.com
GOITI SCL	Gipuzkoa	1961	12.75	10.31	11.67	+24%	0.35	60	www.danobatsheetmetal.com
COUTH INDUSTRIAL MARKING SYSTEMS SL	Gipuzkoa	1963	10.96	11.20	9.92	-2%	2.37	51	www.couth.com
LAGUN MACHINE TOOLS SL	Gipuzkoa	2016	10.95	9.09	9.07	+20%	0.18	38	www.lagunmt.com

Figures in millions of euros. Data referring solely to individual firms headquartered in the Basque Country. Prepared by EMPRESA XXI.

49%
of sales in 2018
correspond to firms
headquartered in the
Basque Country

2014 and 2018, the companies recording annual sales of more than 50 million euros increased their share of the sector's turnover in 2018 from 25.5 to 35.1 percent, up 79.3 percent in the period. Those invoicing less than 10 million fell from 40.0 to 34.5 percent, while those between 10 and 50 decreased from 34.5 to 30.4 percent.



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