**The spoken word takes precedence!**

**German machine tools**

* **Production output in 2019 more stable than anticipated**
* **2020 will be a worrying year**
* **Internationally still at the top**
* **Digitalisation and sustainability are paramount issues**
* **Good starting position thanks to close intermeshing with the research community**

**Statement by Dr. Heinz-Jürgen Prokop, Chairman of the VDW (German Machine Tool Builders’ Association), speaking at the annual press conference in Frankfurt am Main on 13 February 2020**

Ladies and gentlemen,

May I bid you a very cordial welcome to the VDW’s annual press conference. You see us today torn by mixed feelings, between delight and despondency. Delighted because 2019 ultimately went better than originally expected; despondent because 2020 and the succeeding years will be characterised by major challenges for our sector such as haven’t been faced for a long time. This, however, also unleashes energies, and offers opportunities to rethink positions and goals, and to develop new strategies. More about this later.

**Production output almost equalling the preceding year’s record level**

In 2019, the order backlog in the machine tool industry was so extensive that production output well-nigh equalled the preceding year’s record figure. With a small minus of one per cent, the sector once again earned nearly 17 billion euros. A plus was achieved in metal-cutting, which with almost 80 per cent accounts for the majority of machine production output. The repairs and maintenance category showed a modest increase, too.

The principal contributor here was domestic sales, which rose by 16 per cent. Conversely, exports were down by 9 per cent, a fall primarily attributable to a decrease of 11 per cent in deliveries to Asia and of 16 per cent in deliveries to America. Here, the regional results are dominated in each case by the largest markets: China, at minus 13 per cent, and the USA, at minus 15 per cent. Europe, the largest sales region, accounting for more than half of German exports, still performed comparatively well with minus 5 per cent. Bright spots include France, Switzerland, the Netherlands and Hungary, which among the top 15 markets reported rises.

Imports were unable to benefit from the good performance of the domestic market and were down by one-tenth. Among the top-15 vendor countries, only China achieved a substantial increase in its deliveries, of one-fifth. Since the Chinese are struggling with major sales difficulties on their domestic market, they have intensified their efforts to increase exports. In Germany, the machines are mostly sent to specialist dealers, who in their turn sell them on the international market.

Employment as an annual average was still slightly up on the preceding year’s figure, at 73,730. In comparison to December 2018, by contrast, it had shrunk by three per cent at the end of the year. Moreover, on the basis of a company survey conducted in December of last year, the ifo Institute reported an increase in short-time working at 18.6 per cent of companies. Twice as many firms are anticipating this for the upcoming months. Six months previously, the figures were running at 2.4 and 11.9 per cent. In order to avoid further payroll downsizing, the ruling coalition government’s decision on extending short-time working from 12 to 24 months should be promptly implemented. We attach maximised priority to the preservation of jobs, since skilled employees are an important factor for further developments.

Capacity utilisation was running at 81.9 per cent in January 2020, almost one-tenth down on the preceding year’s level. The long-term average capacity utilisation figure is 87 per cent.

**Slump in demand determinant for decreased production output in 2020**

This brings us to the regrettable part, overshadowed by the gloomy prospects for the ongoing year. In 2019, the sector was still benefiting from full order books and a high level of capacity utilisation. Both of these melted away over the course of the year. The decline in demand, already perceptible in the second half of 2018, really picked up speed in 2019. The double-figure fall of more than one-fifth – it applies in similar orders of magnitude for both domestic and export demand – will be determinant for the production result in 2020, where we are expecting a decrease of 18 per cent. This is something the sector hasn’t seen in a long time, following the boom of recent years.

The ongoing combination of a cyclical downturn, structural transformation in the automotive industry, turbulences motivated by trade policies, and last but not least the coronavirus as well, are dampening the propensity to invest all over the world. Investment in plant and equipment are set to rise by less than one per cent in the current year, according to Oxford Economics. Only relatively small markets are in much better shape, like Vietnam, Thailand, Slovakia, Hungary and Poland. But they are quite unable to compensate for the sluggishness of the major customer nations China, USA, Italy or France. The consequence is a correspondingly substantial minus for all key statistics in the German machine tool industry during the current year: production, exports, imports and consumption.

There was, however, one minor and peripheral surprise in the order bookings for December, which were up by two per cent. This means that for the time being the downtrend, supported by orders from abroad and forming technology, 6 and 12 per cent up on the preceding year, has been halted. The drivers were the non-euro nations, with substantial growth of 23 per cent, primarily attributable to large-scale projects, in the automotive industry in Eastern Europe, for example, and in various sectors in China and the USA.

**Germany retains its position in international competition**

In the international rankings, the German machine tool industry has maintained its position, since all other producer nations are struggling with similar developments to Germany’s. On the basis of provisional data for the Top 20 producers, the VDW has calculated for 2019 a decrease in international production excluding parts and accessories of three per cent to 72.1 billion euros. In the top trio, only China, with two per cent, managed an increase. In comparison to previous growth rates, this is indeed a very modest figure. Japan in third place even lost five per cent. In terms of exports, Germany remains the world champion. Japan in second place saw a fall of nine per cent, similar to Germany’s, while Italy in third place suffered a drop of two per cent. In terms of consumption, finally, the world’s biggest market, China, reported a decline for the second time in succession while the USA was likewise down on the preceding year, with a minus of three per cent. Only Germany, in third place, reported a rise.

Worldwide, too, the fall in order bookings was significantly more substantial than in production output. For the year’s first three quarters, the VDW has calculated a minus of 22 per cent. So the prognoses for global machine tool production output in 2020 are correspondingly subdued.

**A fast recovery not in sight**

Ladies and gentlemen, Germany’s Federal Minister for Economic Affairs, Peter Altmaier, recently stated that the economic crisis in Germany was over. This does not apply for large portions of the industrial sector. Industrial production output in Germany will, according to Oxford Economics, fall once again. Only the aviation industry and other vehicle manufacturing sectors beyond the automotive industry are anticipating significant growth of more than three per cent. Investment in plant and equipment at the principal customer industries is showing only a marginal increase. For machine tool consumption, following a slight decline in the preceding year, a minus of one-fifth is expected for 2020.

When we analyse the Ifo Institute’s business climate and the Purchasing Manager Index from Markit, both of them early indicators for future developments, there are in many areas incipient signs of an upturn: in the German capital goods industry, for instance, or at the potential customers in India, Taiwan, the USA and the euro nations. This, however, is no more than a glimmer of hope, since many curves are still deep in the minus zone.

This means that unlike in previous downturns a quick recovery cannot be anticipated. Rather, the machine tool industry does not expect order bookings to bottom out until the year’s second half, which will not, however, suffice for an upturn. So production output will only slowly recover, and will take a while to regain the level of recent years.

**No all-clear for trade-policy conflicts**

It would be helpful if the international trade-policy turbulences were to be quietened, since these are one of the paramount causes for the weak level of demand, and are still leading to major uncertainties among customers. In the case of Brexit, USA-China, sanctions against Russia, Iran, and lots more (the keywords in question have been repeatedly mentioned), however, there is no all-clear in sight. As manufacturers, too, there is precious little we can do to change these politically driven influences.

Following completion of Brexit, not much will alter during the transitional period up to the end of the year. The exigent task now is to negotiate a free-trade agreement that assures the smooth continuation of bilateral business. Arrangements have to be put in place for customs, the frictionless processing of goods consignments, proper functioning of the delivery chains, delegation of staff, and much more.

The trade agreement between China and the USA is, first of all, a gratifying development. It is, however, too early to proclaim the all-clear. And whether following a potential election victory of President Donald Trump in November the conflict will re-ignite is as yet uncertain. There is no end in sight to the sanctions against Russia, either. The Iran conflict continues to escalate. In our view, the task is to repeatedly urge politicians to publicise the value of free trade on the international stage, and vigorously support its preservation.

**Digitalisation ensures efficiency and sustainability in production operations**

The machine tool industry would not, however, be the machine tool industry if against this background it did not pull out all the stops to re-invent itself a little on the side. The ongoing discussion on more climate protection can prove fruitful, focusing attention as it does on what is technically feasible for achieving the ambitious targets for reducing CO2 emissions, as most recently formulated in the Green Deal of the EU Commission.

The machine tool can make its contribution as the key component in industrial production operations. The sector’s own initiatives and its close intermeshing with the production-technology research community come up with many ideas that culminate in more sustainable products and more efficient processes. This cannot, however, obscure the fact that these are just individual building blocks, of limited efficacy in compensating for the losses involved.

The biggest leverage will in future be offered by digital networking. This is the enabler for new business models, a terrain on which a whole lot can still be achieved with appropriate creativity. We are continuing to work on the fundamental precondition for data utilisation, the standardised communication interface umati (universal machine tool interface). The initial products here can be anticipated during the course of this year. You can find out more at the METAV in Düsseldorf from 10 to 13 March.

Cecimo, the European Association of the Machine Tool Industries, has ascertained that only a mere five per cent of small and mid-tier companies in Europe’s manufacturing sector have completely networked their machines, lines, and systems. And only one company in three is taking initial steps in this direction or planning them. This shows the potentials waiting to be tapped here.

More efficiency in the production operation supports sustainable management and smooths the path into the circular economy. Significant factors here include control system technology and full-coverage inter-machine communication. Wireless access to information in realtime is a key factor for optimising production processes, capacities, energy and raw material consumption levels.

With digital twins, for instance, not only products and their characteristics can be optimised in advance, but entire production processes as well. Simulations optimise NC programs and production strategies, so that resource-economy can be in many ways upgraded, and circular production can be planned.

Researchers at the German Academic Society for Production Engineering (WGP) have committed themselves to promoting sustainable production by means of digitalisation. For example, scientists at the university and the Fraunhofer Institute in Stuttgart, plus the University of Applied Science in Darmstadt, have developed an online monitoring tool called *Ecomation*, with which a production system’s energetic fingerprint can be imaged, and improved even before implementation. So even at the production planning stage, energetically optimised resources can be selected.

At present, however, it’s primarily predictive maintenance that creates unequivocal advantages, both economic and ecological. This is reflected in longer operating times of machines and lines. According to Cecimo, moreover, thanks to digitalisation total machine downtime can be reduced by 30 to 50 per cent, while at the same time extending the machines’ useful lifetimes by 20 to 40 per cent. In critical times, customers pay closer attention again to these aspects, and are also prepared to pay for improvements.

**Machine tools are guarantors of sustainable production**

Extend life-cycles – avoid waste: these are the paramount principles for the circular economy. Another building block is the re-use of materials, which is being progressed under the keywords of refurbishing, which denotes the quality-driven reconditioning and repair of machines, and remanufacturing, which denotes the reconditioning of ageing products to bring them up to the level of a new product.

Now the machine tool industry, in particular, is a veritable flagship sector when it comes to sustainability. Machine tools made in Germany already rank among the most sustainable products currently available. We say this in all self-confidence. They excel in terms of lengthy useful lifetimes. For all components of the machine, spare parts are kept available for long periods. For the control system components, the vendors guarantee software updates for several generations. Machine tools tend to be completely overhauled and resold as pre-owned machines rather than be decommissioned. This leads to a second and sometimes even third machine life. When they are scrapped at the end of their useful lifetime, almost all the materials involved can be recycled or upcycled, since it’s primarily top-quality materials amenable to re-use that are employed. Finally, the machines’ productivity is extremely high. This means every single component is manufactured in an energy-economical, resource-efficient process.

Besides optimising the machine components, the manufacturers concerned devote particular attention to energy consumption during the utilisation phase. The raw materials used, and the power and media consumption levels, co-determine the CO2 balance of the production operation. This is why, for example, manufacturers are working on software with which waste and rejects can be further reduced. In conjunction with new hardware, moreover, media consumption levels can be reduced by up to 70 per cent. In the machining process, finally, more process efficiency can be achieved by eliminating individual process steps like reworking.

The European association Cecimo had in May of last year already, in its report *The European Machine Tool Sector and the Circular Economy*,pointed out that Europe can only benefit from resource-economical, sustainable production operations.

One example is the replacement of primary materials by recycled secondary raw materials. Quite a bit of progress has already been made here. Researchers in Hanover have developed the Return and Return II initiative, which renders titanium chips recyclable, so that waste can be recovered for manufacturing new, high-performance titanium components. This creates energy savings and a reduction in CO2 emissions of up to 56 per cent.

**Focusing on the circular economy**

Upheavals along the entire length of the value added chain, beginning with product design, then production processes and business models, all the way through to consumption patterns, waste management and the use of secondary raw materials create new opportunities for the machine tool industry. High quotas for re-use, remanufacturing and recycling have role-model character for many other sectors as well.

Even though machine tools are largely sustainable already: they are located at the very beginning of the value added chain, and are *quasi* the key factor for a sustainable, circular economy. This means that we as a sector can and must help to design production processes to be economically and ecologically fit for purpose.

This is already happening in numerous research projects. At the Karlsruhe Institute of Technology, for instance, researchers are working in conjunction with numerous industrial partners on *DigiPrime*, a platform that networks different stakeholders in the circular economy with each other. What is called adaptive remanufacturing, meaning a situative maintenance strategy, is an innovative approach that is being developed at the Laboratory for Machine Tools and Production Engineering in Aachen under the aegis of the *ReLife* project. Ultimately, this project is intended for developing new business models particularly for mid-tier companies as well.

**New open-technology drive concepts need to be progressed**

The examples cited show that very numerous points of leverage need to be activated in order to develop new sources of turnover and accomplish the transformation towards more sustainability. This also applies for the structural changes in the automotive industry, which are still far from having been completed. It is, in particular, unclear what drive technology will be used to what extent by when, and which makes the greatest contribution towards reducing CO2 emissions. Hybridisation, full electrification and battery technology, fuel cell and synthetic fuels, everything is under discussion. We are absolutely convinced that there have to be differentiated solutions for disparate requirements.

The automotive industry and its component suppliers purchase a significant proportion of machine tool production output, between 35 and 40 per cent. In actual fact, however, these deliveries are not destined solely for the drive train. The association has recently conducted a more differentiated analysis of this, which revealed that in 2019 about 60 per cent of total sales with OEMs and component suppliers were accounted for by engines and transmissions, 40 per cent by bodywork and other system components. It emerges, however, that the order bookings in the power train category are currently showing a significant decline in volume.

It remains undisputed that the transition to new drive technologies will be a protracted process. The VDMA’s study on “Drives in Transition” revealed in its latest update that by 2030 a good 20 per cent of vehicles, referenced to new registrations in Europe, the USA and China, will be fully electrified. The three regions constitute about half of the international automobile market. The result means 64 per cent less value added in the production process with an exclusively electric drive, but growth of almost a quarter in the value added for a hybrid drive.

This also leads to new opportunities for the machine tool industry, not least in the production of components for electric motors, the manufacture of components in the battery stack or high-performance electronics. A word here on our own behalf: this study is currently being updated and expanded again. We shall be presenting selected results to you at the METAV’s opening press conference in Düsseldorf on 10 March.

We had already, one year ago, called for massive technological openness at this point when it comes to developing alternative drives. Back then, electro-mobility was the unilateral focus of public discussion. In the meantime, the debate has begun to move on. Fuel cell and hydrogen are likewise being discussed. In the shape of the National Hydrogen Strategy, this has also been embraced by the Federal Ministry of Economic Affairs. The facts that sales of battery-electric cars have stalled in China and the USA, the Chinese government has discontinued its subsidies, and hardly any electric vehicles are being bought in Germany despite financial support, however, permit justified doubts to be voiced as to whether concentration on a single technology is the right approach. This difficult situation, at least, confirms once again our recommendation not to rule out *per se* any of the new technologies.

Mid-tier machine tool manufacturers will be well advised to keep their strategies flexible. Quite a few companies are successfully adjusting to the politically driven thrust for e-mobility as good, tried-and-tested partners of the automotive industry and its component suppliers. For example, they offer solutions for manufacturing rotors and stators for electric motors, like hairpin technology, lightweight construction for the drive train, lighter battery housings or mass-production technologies for battery production, such as the cutting and welding of copper foils. In some cases, sales are already in the three-figure-million range. Other companies are diversifying towards the aviation industry or medical technology.

So it remains intriguing to see how the business community will cope with this massive restructuring task. Our concern must be to repeatedly urge that all modification measures be controlled with free-market-based instruments and the best CO2 avoidance options be sought on a technology-neutral basis.

Thank you very much for your attention!