Forecast Report

Framework Conditions: Future Development of the Economy as a Whole and the Jenoptik Sectors

The International Monetary Fund (IMF) further downgraded its growth forecasts in January 2019, and is now expecting the global economy to grow by 3.5 percent in 2019 (prior forecast: 3.7 percent), followed by 3.6 percent in 2020. The risk of a greater decline in global growth has increased and the weakness seen in the second half-year 2018 will continue in the coming quarters. In addition to escalating trade conflicts between the US and other economies, risks include a potentially disorderly Brexit, a new debt crisis in the euro zone, for example in Italy, and a drop in Chinese economic momentum.

The Chinese government is attempting to counter the economic slowdown and is planning for major tax cuts and higher infrastructure spending in the current year. In view of the trade conflict and a generally weaker global economy, China is expecting GDP to rise just 6 to 6.5 percent in 2019.

According to the IMF, the US economy will continue to grow.

By contrast, the IMF has significantly cut back its forecast for Germany: weakness in industrial production, particularly in the automotive industry, and a drop in foreign demand mean that growth is not likely to exceed 1.3 percent in 2019, down from 1.9 percent. The German economy saw a downturn at the start of the year, according to the ifo Institute. Its Business Climate Index fell for a fifth time in succession in January, with both the present situation and the future outlook downgraded. Uncertainties were primarily the result of problems in key emerging economies, the trade conflict between the US and China, the worrying prospect of a no-deal Brexit, and an economic slowdown in China. The German government is therefore now expecting growth of just 1.0 percent in the current year. Its original forecast of 2.1 percent had already been reduced to 1.8 percent in 2018. For 2020, the German government is anticipating stronger growth of 1.6 percent.

At the time this report was prepared, the economic outlook caused by Brexit was still uncertain, particularly in the event that Great Britain leaves the single market and the customs union with no transition agreement in place. According to the British Chambers of Commerce, thousands of British companies have already triggered emergency plans to cope with a no-deal Brexit, building up stocks to prevent delivery bottlenecks. A number of car manufacturers and aircraft manufacturer Airbus have also announced factory closures or relocations to the European continent in the event of a “hard” Brexit at the end of March 2019. According to the Association of German Chambers of Industry and Commerce (DIHK), the customs controls and bureaucracy that this would entail would result in up to 10 million additional customs declarations and over 200 million euros in extra costs a year for German companies alone.

According to the analysts at Markets and Markets, the global photonics market will grow from 530 billion US dollars to a value of 795 billion US dollars by 2022, an average of 8.4 percent annually, chiefly driven by strong demand from applications such as displays, information and communication technology, medical technology and life sciences, metrology, lighting, and production technology. Spectaris, the German industry association, also assesses the outlook for the German photonics industry as positive: key drivers of growth in the industry include topics such as “Industry 4.0” and smart factories, where large numbers of optical sensors and image capture and processing systems are required. The association also sees the

T51 Gross domestic product forecast (in percent)

	2019*	2020*
World	3.5	3.6
US	2.5	1.8
Euro zone	1.6	1.7
Germany	1.3	1.6
China	6.2	6.2
India	7.5	7.7
Emerging countries	4.5	4.9

Source: International Monetary Fund, World Economic Outlook, January 2019
* Forecast

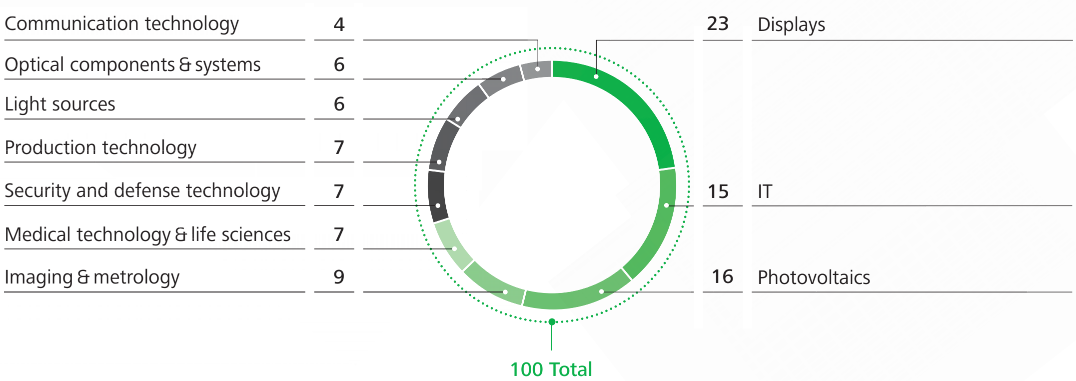
automotive industry adopting a key role with regard to autonomous or semi-autonomous driving, particularly involving optical metrology for data acquisition or LiDAR sensor technology. As stated by the market researchers at Research and Markets, the automotive LiDAR market will grow by an average of almost 30 percent annually over the next ten years as demand for autonomous vehicles and advanced driver-assistance systems (ADAS) increases.

Photonic technologies lie at the heart of many diagnostic procedures and treatment methods used in medical technology, for example in in-vitro diagnostics, endoscopy, and in point-of-care solutions for patient-oriented treatment. Market research company EvaluateMedTech, cited by Spectaris, is forecasting annual growth of some 5 percent, to around 530 billion US dollars in 2022, for the global medical technology market, while sounding cautious on regulatory uncertainties and environmental legislation.

Following a record year in 2018, the international laser market could again grow by 5 to 6 percent in 2019, according to the forecast published in "Laser Focus World" magazine's annual review. Volatile macro-economic conditions could, however, endanger this target.

Following several record years, the major semiconductor equipment manufacturers see the prospects for 2019 in a more cautious light. The slight downturn in the second half-year 2018 is expected to continue in the first few months of 2019. Demand for semiconductors for smartphones, tablets, servers, and cars is in decline at the same time as customers' inventory levels are high and there is general uncertainty caused by trade conflicts and a weaker global economy. The SEMI trade association is expecting revenues to fall 4 percent in 2019, but is more optimistic about 2020, when growth of 20.7 percent, to 71.9 billion US dollars, could signal a new all-time high.

G24 Global photonics market in 2020: 615 billion euros (share in percent)

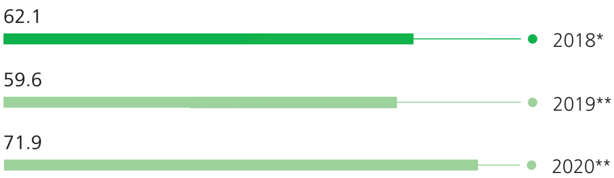


Source: VDMA, ZVEI, Spectaris: Photonics Industry Report 2013

The semiconductor industry is also bracing itself for moderate growth: according to forecasts by the SIA, global revenue in 2019 will rise only 2.6 percent on the prior year. As sales of smartphones stagnate, companies need to move into other areas such as the Internet or the automotive field. Semiconductor manufacturers are hoping for strong business with autonomous vehicles and electromobility. G25

German mechanical engineering companies started 2019 with an order backlog of around eight months, which could temporarily cushion any restrictions caused by Brexit. The situation could be aggravated if several risks emerge at the same time: a hard Brexit, an escalation of the trade conflict between the US and China, and a deepening of the debt crisis in Italy – in which case four of five main export markets would be affected. Nevertheless, the German Mechanical Engineering Industry Association (VDMA) is anticipating growth of 2 percent in 2019. The industry association also published a study entitled "China Business of the Future", according to which increasing numbers of Chinese companies are being developed with government assistance to compete with German small and medium-sized entities, including in the high-end segment.

G25 Semiconductor equipment:
Global revenue forecast (in billion US dollars)



Change 7.5 %

Source: Semiconductor Equipment and Materials International (SEMI)
* provisional calculation
** forecast

The trend toward increasing automation shows no sign of abating: market research company Gartner is expecting the "robotic process automation" software market to grow to a value of 2.4 trillion US dollars by 2022, compared with 680 million US dollars in 2018. The International Federation of Robotics (IFR) is forecasting growing robot sales to meet rising levels of automation in the automotive industry. Global sales of industrial robots are set to grow by an annual average of 14 percent by 2021. Smaller and medium-sized manufacturers are also increasingly employing automation technologies, requiring simple and flexible robotics solutions. In addition to the large robots deployed in the automotive industry, the IFR is expecting increased demand for "cobots", smaller collaborative robots that enable close cooperation between man and machine.

In the automotive industry, China is opening up its market, but details are as yet sketchy: the country wants to reduce tariffs on car imports and in general enable greater market access and better investment conditions for foreign companies. The German Association of the Automotive Industry (VDA) welcomed these announcements in April 2018, as China is an important export market and production location for German manufacturers and suppliers. Developments in international trading policies give the VDA cause for concern: the German automotive industry is dependent on free access to markets. The extent and impact of any new punitive tariffs imposed after a break in negotiations are not yet foreseeable. Industry associations warn that, in the automotive industry, for example, import duties could result in higher prices, loss of revenue, an investment backlog, and job losses in production, the supplier chain, and trade.

The automotive industry is also adapting to new, extremely strict technology and environmental regulations. The introduction of the new WLTP exhaust emissions test caused many manufacturers to scale down car production; the situation is only now slowly returning to normal. In addition, the EU nations plan to tighten carbon dioxide emissions limits for new cars: from 2020 to 2030, they aim to reduce limit values by 35 percent and increase the number of electric and hybrid vehicles in the EU. To achieve the latter objective, the EU Parliament wants to oblige car manufacturers to ensure that at least 35 percent of the cars they sell have low emissions by 2030.

The "Global Automotive Outlook" study, published by consultants AlixPartners in July 2018, is forecasting a bleaker outlook for manufacturers and suppliers: on the one hand, growth in the global car market will slow down through 2025, while at the same there is a need to make high investment, particularly in electric drive systems and autonomous driving concepts. Car manufacturers are therefore planning to work in partnership with each other, as well as with automotive suppliers, IT companies, and mobility service providers.

In its "Road Safety Market by Solution, Service" report, US market research company Markets and Markets believes that the global traffic safety market will grow from 2.6 billion US dollars in 2016 to 4.1 billion dollars in 2021, an average annual increase of 9.3 percent. Key factors include the growing number of traffic accidents, growing urbanity and mobility, and increasing statutory regulations for traffic safety. Automatic number plate recognition (ANPR) is becoming more important as a means of traffic monitoring and prevention: as set out in industry reports, market researchers expect the ANPR market segment to grow by an average 12.8 percent annually and be worth 1.4 billion US dollars by 2023. The technology could also be used should a hard Brexit require customs controls. ANPR could further be used to monitor entry permits or restricted zones, such as those in which diesel vehicles are prohibited in Germany. Before this can be done, the necessary (regulatory) political conditions first need to be created.

According to the EU Commission, it will be difficult to achieve the political goal of halving the number of road deaths to around 16,000 between 2010 and 2020. In order to increase traffic safety, the EU Commission intends to adopt new measures that aim to ensure no more road deaths on Europe's roads by the year 2050. Examples include strategies for networked and automated mobility, financing for research projects, improved vehicle technology, or intelligent speed assistant systems that aid compliance with speed limits.

In the rail industry, increased international competition among train manufacturers is having consequences: Bombardier has announced restructuring plans to reduce its workforce while retaining all German plants by 2020; on the other hand, the planned merger of Siemens and Alstom was barred by the EU Commission, citing competition concerns. Market research company SCI Verkehr sees the industry's wave of consolidation reaching a new high, which may lastingly change the manufacturing landscape to help counter competition from China. Companies are hoping that these mergers will primarily reduce development and approvals costs. According to SCI Verkehr, the global market for railway technology is on course for growth with a current market volume of 183 billion euros and an expected annual growth rate of 2.8 percent. However, according to "Worldwide Market for Railway Industries 2018", published on the occasion of the Innotrans trade fair in October 2018, this growth could be endangered by protectionism and both political and economic uncertainty to a greater extent than previously assumed. In addition to the electrification of routes, key trends include alternative drive concepts, digitization, and automation, the latter with the ultimate goal of autonomous railways. The Chinese rail technology market, currently worth 34 billion euros, will remain at its high level in the next five years but not grow further, according to a study entitled "The Chinese Railway Market" from SCI Verkehr. Due to overcapacity, Chinese companies need to focus more strongly on international markets in order to balance a slowdown in growth in their national market.

According to reports issued by Airbus and Boeing, the major aircraft manufacturers increased their long-term forecasts for the aviation industry in summer 2018. As stated in its "Global Market Forecast", Airbus anticipates that the airlines will buy a total of around 37,400 new passenger jets and cargo planes worth 5.8 trillion US dollars by 2037. Boeing forecasts a demand for 42,730 aircraft worth 6.3 trillion US dollars. Both aircraft manufacturers are hoping for a boost with the help of new models in the MOM segment ("Middle of the Markets") but, according to a study by Alix Partners, are coming under increasing pressure from smaller competitors. Airbus will cease production of the A380 aircraft following final deliveries in 2021. Following the cancellation of two major orders, the company says that its order backlog is no longer sufficient to continue production beyond this date.

In the security and defense industries, the EU nations plan to boost cooperation with each other. At the heart of the "Pesco" European defense pact established in 2017 is the future joint procurement of defense equipment and coordination of defense projects, supported by a European defense fund for research projects worth 13 billion euros by 2027. Germany and France, in particular, are planning to work more closely together to jointly develop a fighter jet to replace the Eurofighter and Rafale models in the future. The German Ministry of Defense will receive 33 new Eurofighters, allowing Airbus to maintain production for several more years. Great Britain has announced its intention to return to an armored vehicle engineering program: a joint venture between Rheinmetall and BAE Systems aims to secure value creation in Great Britain, in part through the construction of a production facility for armored vehicles.

In Germany, spending on security and defense technology is due to rise sharply under plans revealed by the Ministry of Defense – from almost 43 billion euros in 2019 to 60 billion euros by 2023. This corresponds to about 1.5 percent of GDP. This investment aims to meet NATO requirements that stipulate greater expenditure on national and alliance defense. A new arms race may be imminent, especially considering that the US and Russia have suspended their involvement in the INF treaty that bans intermediate-range nuclear weapons and plan to develop new missile systems.

Expected Development of the Business Situation

Planning assumptions for the Group and the divisions

The forecast for the future business development was based on the group planning undertaken in the fall of 2018 and the Strategy 2022 published in early 2018. Since January 1, 2019, Jenoptik has the following reportable segments: the Light & Optics, Light & Production, Light & Safety and VINCORION divisions.

The starting point is formed by the separate plans from the divisions and operational business units, which are harmonized and integrated in the group planning. Possible acquisitions and exchange rate fluctuations are not included in the planning process.

The system of key performance indicators covers the revenue, EBITDA margin, order intake, free cash flow, and capital expenditure. Other indicators will also be regularly compiled in the future and are used by top management for informational purposes.

See the Control System chapter for more information on the key performance indicators

In 2018, we began rolling out our Strategy 2022, which is focused on photonic technologies. In the process, we are concentrating on three building blocks – focus, innovation, and internationalization. We established our new corporate structure on schedule at the start of the 2019 fiscal year, which also forms the basis for our reporting from January 1, 2019 on.

See the Business Model and Markets and the Targets and Strategy chapters for more information on the strategy and the new division structure

The Jenoptik Group anticipates a continued good development of business in the Light & Optics division in 2019. We aim to boost our leading position in the photonics market by stepping up our activities as a global OEM supplier of solutions and products based on photonic technologies, by focusing on key sales markets, by growing our global reach, and with innovative products and a larger range of integrated system solutions. For the semiconductor equipment market, observers expect demand to fall marginally in the current year. Here, however, the division can profit from its position as one of the leading suppliers of optical and micro-optical system solutions for semiconductor production. In order to support the positive

See the Framework Conditions chapter for more information on the future development of the Jenoptik sectors

development and broaden our presence in core markets, a focus on optical information and communication technologies is growing in significance. In medical technology and life science, existing cooperation arrangements with key international customers are due to be expanded in the current fiscal year and contribute to growth. In the current fiscal year, the division will also continue to invest in the international production locations and sales to promote future growth and continue the process of internationalization. As an example, Jenoptik is investing further in modern production equipment, thereby anticipating a sustained high level of demand and securing its long-term competitiveness in one core photonics business.

In the Light & Production division, we also expect to see a positive development in a market environment that is becoming ever more difficult in 2019. The acquired companies will also help to achieve this. In the metrology sector, we assume that the trend toward integrated production-related metrology will continue. This plays a particularly important role when precision parts are manufactured, such as those required by the automotive industry for efficient and environmentally-friendly drive systems. In order to respond to this trend, the division is continuing to invest in the development of innovative and high-performance technologies and systems. New development and production capacities, and modern office spaces, will be built at the Villingen-Schwenningen location starting in the spring of 2019. Key growth momentum is also expected in the field of laser machines. Alongside established systems for plastics processing in the automotive industry, the division is primarily focusing on the field 3D material processing. It acquired the Canadian company Prodomax in the summer of 2018. The combination of automation solutions and laser processing machines gives Jenoptik an opportunity to tap into further potential for growth in the field of advanced manufacturing and takes a further step along the road to becoming an integrated supplier of high-tech production environments. We also continue to grow from developing stand-alone machines to supplying modular systems and solutions for customer manufacturing in the B2B segment, thereby boosting our customers' productivity. We aim to counter growing price pressure from our competitors with efficient and more flexible system solutions. Our international reach is also due to grow, especially in China.

Following a fiscal year marked by revenue growth and a significant margin improvement, in 2019 the Light & Safety division faces the task of compensating for the loss of revenue and earnings from the project to supply toll monitoring systems. Orders received from the North Africa / Middle East region in the fall of last year will contribute to achieve this aim. Jenoptik won out over several international manufacturers in a tendering process requiring a high level of technical expertise. Further orders are currently in the pipeline. In the fall of 2018, Jenoptik received approval in Germany for section control measuring systems, a technology that has already proven itself in other countries. Beyond this, the Traffic Service Provision business model will also be rolled out further. The civil security business is another area that is growing in significance. We will expand our product range in 2019, particularly in the area of traffic monitoring. Deep learning technology is due to be used to a greater extent in safety and civil security applications. On a regional level, Jenoptik is primarily expecting growth momentum benefiting the Light & Safety division to come from Europe and the Americas.

The VINCORION division is expected to see stable development in 2019. Its business is predominantly project-based and geared toward the long term. After years of stagnation, defense spending in Europe, particularly in Eastern Europe, is picking up again. In Germany, too, a range of new procurement projects are in the pipeline. Key criteria include connectivity, automation, and energy efficiency. At the same time, a potentially more restrictive export policy under the present government in Germany could impact on or delay projects.

In the medium term, a significant increase in investment for the German armed forces has political support, but we do not expect this to have any effect on our business in the short term, as political decision-making processes are generally highly protracted. In the years ahead, however, they may contribute to higher revenues. Internationalization also remains a key topic in 2019; foreign business is due to expand steadily, particularly in North America and Asia/Pacific. Beyond this, the division is looking to further increase the share of systems used in civilian fields. These include system solutions for civil aviation, for example the rescue hoist.

Earnings position forecast 2019

On the back of a robust order situation and continuing good demand from our markets, the Executive Board is expecting revenue and earnings to grow in 2019. Market developments and currently identifiable risks such as bottlenecks in the supply chain are subject to ongoing monitoring. Our scheduled growth also presupposes that political and economic conditions do not worsen. In particular, these include economic trends, the potential impacts of Brexit, regulations at European level, export restrictions, and further policy developments in our sales markets.

The Jenoptik Group anticipates revenue growth without major changes in the portfolio in the mid single-digit percentage range for 2019 (prior year: 834.6 million euros), with key contributions to growth coming from the Light & Optics and Light & Production divisions.

At present, Jenoptik is expecting EBITDA (earnings before interest, taxes, depreciation, and amortization, incl. impairment losses and reversals) to grow in the 2019 fiscal year (2018: 127.5 million euros); the EBITDA margin is due to come in at between 15.5 and 16.0 percent. This includes the positive impacts arising from the introduction of IFRS 16, "Leases".

For further information on IFRS 16 see the Notes on page 144

The order intake for a period is in part affected by major orders, particularly in the VINCORION and Light & Safety divisions. In the past fiscal year, Jenoptik received new orders worth 873.7 million euros and had thus built up a very good order base at year-end 2018. For the current fiscal year, Jenoptik assumes that its order intake will grow slightly, despite an already high initial value. Also worthy of note is that Jenoptik had frame contracts worth 62.5 million euros at the end of 2018, which are not included in the order intake or backlog. Around 79 percent of the order backlog as of the end of December 2018 will be converted to revenue in 2019 (31/12/2017: around 79 percent).

T52 Summary of targets for the Group and divisions (in million euros)

	Actual 2018	2019 guidance
Revenue	834.6	Growth in the mid single-digit percentage range (without major changes in the portfolio)
Light & Optics	339.6	Growth in the mid single-digit percentage range
Light & Production	210.9	Growth in the low double-digit percentage range
Light & Safety	116.9	Noticeable decline (2018: settlement of a major order)
VINCORION	166.4	Stable
EBITDA / EBITDA margin	127.5 / 15.3 %	EBITDA margin between 15.5 and 16%
Light & Optics	74.1	Growth in the mid single-digit percentage range
Light & Production	24.6	Growth slightly stronger than revenue
Light & Safety	15.9	Decline in line with revenue
VINCORION	20.1	Slight increase, improved margin
Order intake	873.7	Slight increase
Free cash flow	108.3	Approx. 80 million euros
Capital expenditure [1]	42.5	Significant increase

[1] Without capital expenditure on financial investments

Following the very positive business performance in 2018, with new record revenue and earnings figures, the Light & Optics division is expecting revenue and EBITDA to increase in the mid single-digit percentage range in 2019.

Buoyed by the contributions to revenue made by the acquired companies, the Light & Production division is anticipating revenue growth in the low double-digit percentage range in the current fiscal year. EBITDA is expected to grow slightly stronger than revenue. The accuracy of forecasts in this division is influenced by the times at which projects are settled.

The Light & Safety division settled a major project with the delivery of toll monitoring systems in 2018; its contribution to revenue can probably not be fully compensated in the current fiscal year. The division is therefore expecting revenue and EBITDA to each fall noticeably. In this division, too, the accuracy of forecasts is influenced by the times at which projects are settled.

In the 2019 fiscal year, the VINCORION division is expected to contribute to the company's overall success with stable revenue, a slight rise in EBITDA, and an improved EBITDA margin.

Group asset and financial position forecast

For the 2019 fiscal year, Jenoptik is forecasting a significant increase in capital expenditure. The largest single investment, worth over 13 million euros, will be the construction of new development, production, and office spaces for industrial metrology at the Villingen-Schwenningen location. Capital expenditure on property, plant, and equipment will focus on the growth areas within the divisions or take place within the scope of new customer projects. It aims to expand capacities, thereby ensuring future growth.

Following a sharp rise in the free cash flow over the past fiscal year, we are expecting a free cash flow of around 80 million euros in 2019. Even considering the rise in capital expenditure, this will allow all interest, tax, and dividend payments to be covered by the free cash flow.

Dividend. In addition to financing the continued growth of the company, the future aim of the Executive Board is still to ensure a dividend policy in line with corporate success. In the view of the Executive Board, a stable provision of equity for sustainable organic growth to increase the enterprise value as well as the exploitation of opportunities for acquisitions are also of crucial importance to the interests of the shareholders.

See the Events after the Balance Sheet Date for more information on the dividend

Important note. The actual results may differ significantly from the forecasts of anticipated development made above and summarized below. This may arise, in particular, if one of the uncertainties mentioned in this report were to materialize or if the assumptions upon which the statements are based prove to be inaccurate in relation to the economic development.

General Statement by the Executive Board on Future Development

In the current 2019 fiscal year, the Jenoptik Group will continue rolling out its Strategy 2022, focusing on photonic technologies. In terms of economic development, our key focus remains on profitable growth. We believe that revenue growth, resulting economies of scale, and more efficient and faster processes result in higher, sustainable earnings.

Despite an increasingly difficult environment, Jenoptik aims to see further successful growth in 2019, building on a strong order backlog and good demand in our markets. The solid asset position and a viable financing structure also give us sufficient room for maneuver to finance further growth and acquisitions. In 2019, the Executive Board is forecasting revenue growth in the mid single-digit percentage range without major changes in the portfolio and an EBITDA margin of between 15.5 and 16.0 percent. Achieving these targets is dependent on economic and political conditions.

In the current fiscal year, we will again invest a significant portion of our funds in the expansion of international sales and value creation structures, as well as in the development of innovative products. As part of our active portfolio management, potential acquisitions are closely scrutinized; divestments are not ruled out.

The Executive Board expects positive corporate development within the Jenoptik Group overall during the 2019 fiscal year.

Jena, March 7, 2019

JENOPTIK AG
the Executive Board