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Forecast Report

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

In its most recent “World Economic Outlook” of January 2018, the International Monetary Fund (IMF) expects the **global economy** to keep growing, by a robust 3.9 percent in each of the next two years. It believes that the lively demand seen in the recent past will in particular be bolstered by capital expenditure thanks to favorable global financing conditions. This, according to the IMF, will have a noticeable effect on growth in export-oriented countries. Tax reforms in the US are also likely to have a stimulating effect that could boost demand in neighboring countries. The IMF sees risks in protectionist trends and trade barriers, e.g. in connection with Brexit, and in ongoing geopolitical tensions, primarily in East Asia and the Middle East. **T46**

According to the analysts at Markets and Markets, the global **photonics** market will grow to a value of 795 billion US dollars by 2022, chiefly driven by strong demand from applications such as displays, information and communication technology, medical technology and life sciences, measurement, lighting, and production technology. On a regional scale, Asia/Pacific will see the highest average rate of growth. By comparison, in their “Photonics Industry Report” the Spectaris, VDMA and ZVEI industry associations still anticipate average annual growth of 6.5 percent and a market volume of 615 billion euros in 2020.

T46 Gross Domestic Product Forecast (in percent)

	2019*	2018
World	3.9	3.9
US	2.7	2.5
Euro zone	2.2	2.0
Germany	2.3	2.0
China	6.6	6.4
India	7.4	7.8
Emerging countries	4.9	5.0

Source: International Monetary Fund, World Economic Outlook, January 2018
 * Forecast

The field of silicon photonics is becoming increasingly important to data transfer and the necessary optics design. It uses silicon as an optical medium. French market research company Yolé Développement is anticipating considerable expansion in this field: it believes the global market for optical components enabling rapid and high-volume transfer will be worth 4 billion US dollars by 2025, not least due to steadily increasing data traffic on the internet resulting from social media, video, and game applications.

Photonic technologies are a key element of many diagnostic and treatment methods in **medical technology**, e.g. in-vitro diagnostics, endoscopy and in so-called point-of-care solutions. The Spectaris trade association is expecting revenue growth of 5 percent to approximately 32 billion euros for German manufacturers of medical technology in 2018. Digitization will have the strongest impact on the development of the industry, e.g. in medical care and production processes. According to Spectaris, the business model of the manufacturers is also undergoing changes: from the classical supplier of equipment in the past decade to a solution provider in the current decade through to a provider of digital and integrated healthcare solutions in the next decade. The Evaluate-MedTech market research company, who is quoted by Spectaris, is expecting the global market for medical technology to grow by an average of about 5 percent per year to approximately 530 billion US dollars by 2022.

According to industry experts, the robust momentum seen in the global **semiconductor market** in the prior year is set to continue in 2018, albeit at a slightly weaker pace. As stated in a press release, IT market research company Gartner is forecasting revenue growth of 7.5 percent in 2018, to 451 billion US dollars; following a double-digit increase in 2017, the industry will return to a single-digit growth rate and is then expected to see a marginal fall in revenue in 2019. The SIA association’s forecast, published in a press release, also projects only moderate revenue growth for 2018.

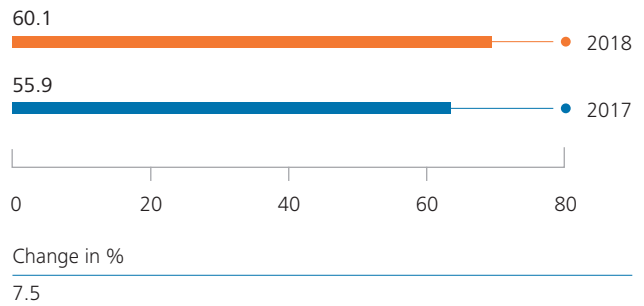
In the **semiconductor equipment industry**, the SEMI industry association sees global revenues growing 7.5 percent to a new record of 60.1 billion US dollars in 2018, according to its most recent forecast issued in a December 2017 press release. South Korea, China, and Taiwan will remain the biggest markets. **G24**

The VDMA is warning of new trade barriers and protectionist policies: Germany's export-oriented **machinery and plant engineering industry** will face additional export and import costs running into the nine figures following Great Britain's withdrawal from the EU, according to the association's calculations. German **machine tool manufacturers** are expecting production to grow again in 2018, by 5 percent to reach a value of over 16 billion euros for the first time, according to the industry association VDW. It sees the move toward electromobility as a challenge to the industry, but a downturn in demand for traditional machining methods could be more than compensated for by a global increase in new car registrations and investment in the change to hybrid drive systems or all-electric vehicles.

The International Federation of Robotics (IFR) is forecasting growing robot sales to meet rising levels of **automation** in the automotive industry. In the US alone, revenue generated with industrial robots is due to rise by an average of at least 15 percent annually in the years from 2017 through 2020. In its "World Robotics Report", the IFR estimates global demand for industrial robots to grow to over 3 million units by 2020. This compares with a figure of around 1.8 million units in 2016. In addition, both small and medium-sized manufacturers are increasingly turning to automation, creating demand for flexible and simple robotics solutions.

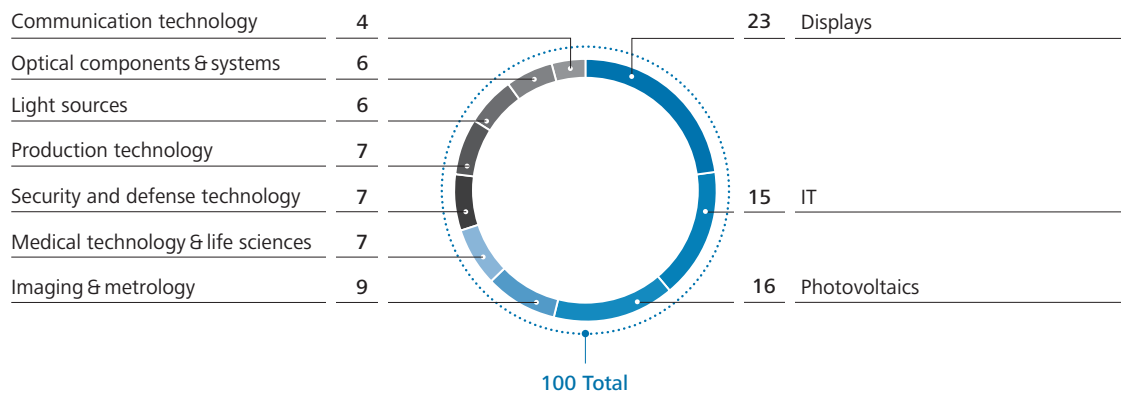
According to a study conducted by consulting firm McKinsey, the changes affecting the **automotive industry** will produce significant growth in revenue: by 2030, it sees a potential revenue increase from 3.4 trillion to 6.6 trillion euros, chiefly driven by new automotive mobility services, autonomous driving, and alternative drive systems. According to the forecast, the latter will account for around a quarter of total revenue by 2030, from a current level of less than 1 percent. For 2018, the German

G24 Semiconductor Equipment: Global Revenue Forecast (in billion US dollars)



Source: Semiconductor Equipment and Materials International (SEMI)

G23 Global Photonics Market in 2020: 615 billion euros (share in percent)



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

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Association of the Automotive Industry (VDA) is projecting weak growth in the global car market, to 86 million vehicles.

Within the field of [traffic and public safety](#), there is strong demand for automatic number plate recognition systems (ANPR). According to the market researchers at Research and Markets, the market will grow by an average 12 percent annually through 2025. This development will be driven by applications for safety and traffic management, including monitoring, and toll solutions. With a view to a European toll system, the EU Commission has fleshed out its plans for a toll based on actual distance traveled and no longer on the purchase of a vignette for a specific period. In Germany, section control is due to be launched on an initial stretch of road in Lower Saxony in the spring of 2018. The federal state has been preparing to introduce this speed monitoring technology to Germany in the last few years. Jenoptik technology has been deployed on the pilot project.


In the global [rail industry](#), established structures are being shaken by the planned merger of Siemens and French manufacturer Alstom that aims to counter the competition in the industry, primarily from China. As reported by market research company SCI Verkehr, the German rail industry will grow by an average 3.4 percent annually up to 2021 and thus more strongly than the global market. Digitization and the demands of more environmentally-friendly solutions are becoming increasingly important, according to the SCI market survey of September 2017.

In the [aviation](#) market, aircraft manufacturers Airbus and Boeing 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 at the Paris Air Show in June 2017, are coming under increasing pressure from smaller competitors in Canada, Brazil, China, Japan, and Russia. Both manufacturers raised their long-term forecasts for the aviation industry: as stated in a press release, Airbus anticipates that the airlines will buy a total of around 34,900 new passenger jets and cargo planes worth 5.3 trillion US dollars by 2036. Boeing forecasts a demand for 41,030 aircraft worth 6.1 trillion US dollars. A potential halt in production of the Airbus A380 aircraft was averted in January 2018: the Airbus Group received a major order allowing production to continue until at least 2025.


In the area of [security and defense technology](#), the EU nations laid the foundations for the "Pesco" defense pact in June 2017: at the heart of their plans is the future joint procurement of defense equipment and coordination of defense projects, supported by a European defense funds for research projects. Germany and France, in particular, are planning closer cooperation on defense policy. As such, the aim is for plans to be drawn up by mid-2018 for the joint development of a fighter that is intended to replace the Eurofighter and Rafale models in the future. The German armed forces plan to increase tank numbers to just under 330 by 2023 through purchase or modernization. In the US, military spending is due to increase by three to five percent in the years from 2019 through 2023.


Expected Development of the Business Situation

Planning Assumptions for the Group and Segments

The forecast for the future business development was based on the [Group planning](#) undertaken in the fall of 2017 and the "Strategy 2022" published at the beginning of 2018. 

The starting point is formed by the new Jenoptik "Strategy 2022" and the plans from the segments 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.

At the start of the 2017 fiscal year, the system of key performance indicators was subjected to further development at both Group and segment level, and focused on the revenue, EBITDA margin, EBIT margin, order intake, free cash flow, and capital expenditure indicators. Other indicators will also be regularly compiled in the future and are used by top management for informational purposes. 

In 2018 we will begin rolling out our new strategy, which is focused on photonic technologies. In the process, we are concentrating on three issues – focusing, innovation, and internationalization. Over the 2018 fiscal year, a new corporate structure is due to be established and will become the basis for reporting from January 1, 2019. 



See the Business Targets and Strategy chapter for more information on the strategy and the new segment structure



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



See the Targets and Strategy chapter for information on the new strategy and organizational structure

The Jenoptik Group anticipates a good development of business in the [Optics & Life Science segment](#) also in 2018. It intends to boost its leading position in the photonics market by expanding its technological expertise and offering a larger range of integrated system solutions with a higher share of added value. Jenoptik is securely established as a development and production partner for numerous international market leaders. For the semiconductor equipment market, observers are expecting strong demand to continue in the current year. Here, the segment can profit from its position as one of the leading suppliers of optical and micro-optical system solutions for semiconductor production. A further priority supporting this positive development remains the focus on optical information and communication technologies. 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 2018, the segment will also continue to focus on the acquisition of new major customers. On a regional level, growth is particularly expected in Asia/Pacific and the Americas. In the current fiscal year, the segment will also continue to invest in the international production locations and sales to promote future growth and continue the process of internationalization, especially in the core regions.

The [Mobility segment](#) also expects good growth in 2018. In the automotive 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 segment is continuing to invest in the development of innovative and high-performance technologies and systems. Key growth momentum is also expected in the field of laser machines. Alongside established systems for plastics processing in the automotive industry, the segment is primarily focusing on 3D material processing. In 2017, the segment secured key expertise in process automation for material processing with its acquisition of the US company Five Lakes Automation, and now offers automated production lines from a single source. This has allowed Jenoptik to exploit new potential for growth in the US market. In the field of traffic safety, scheduled growth will mainly be supported by the major orders secured in prior years, which will contribute to the increase in revenue in 2018. This also includes the delivery of toll monitoring systems. The Traffic Service Provision business model will also be rolled

out further. The civil security business is another area that is growing in significance. From a regional perspective, Jenoptik forecasts the greatest growth momentum for the Mobility segment in the Asia/Pacific region and North America. We believe that the traffic safety market in the US will continue to stabilize in 2018.

For 2018, we expect stable development in the [Defense & Civil Systems segment](#). Its business is predominantly project-based and geared toward the long term. The defense market in the West is continuing to grow and an increase in expenditure – primarily in NATO member states – is expected in the coming years, meaning that demand for defense products could rise. At the same time, a potentially more restrictive export policy under a new coalition 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, it may contribute to higher revenues. Internationalization also remains a key topic in 2018; foreign business is due to expand steadily, particularly in North America and Asia/Pacific. Beyond this, the segment is looking to further increase the share of systems used in civil fields. These include, for example, system solutions for civil aviation.

2018 Earnings Position Forecast

In view of the sustained high level of demand in our markets and on the basis of a good order and project pipeline, the Executive Board is forecasting growth in revenue and earnings for 2018. Currently identifiable risks, such as bottlenecks in the supply chain or exchange rate developments, in particular the euro to the US dollar, are subject to ongoing monitoring. Our scheduled growth also presupposes that political and economic conditions do not worsen. These primarily include the effects of Brexit, regulations at European level, export restrictions, further developments in the US, China and the Middle East, and the conflict between Russia and Ukraine.

The Jenoptik Group anticipates [revenue](#) of between 790 and 810 million euros for 2018 (prior year: 747.9 million euros). The Optics & Life Science and Mobility segments are due to make the greatest contribution to revenue growth.



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

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At present, Jenoptik is expecting EBITDA (earnings before interest, taxes and depreciation/amortization, incl. impairment losses and reversals) to grow in the 2018 fiscal year (2017 EBITDA of continuing operations 106.7 million euros); the EBITDA margin is due to come in at between 14.5 and 15.0 percent. The Executive Board is also forecasting a rise in EBIT (2017: EBIT of continuing operations 77.8 million euros). The operating earnings margin (EBIT margin) is expected within the range of 10.5 to 11.0 percent.

The order intake for a period is affected by major orders, particularly in the Defense & Civil Systems and Traffic Solutions divisions. In the past fiscal year, Jenoptik received new orders worth 802.9 million euros and had thus built up a very good order base at year-end 2017. For the current fiscal year, Jenoptik is expecting the order intake to remain stable, as the fiscal year included an operational one-off impact. Also worthy of note is that Jenoptik had frame contracts worth 87.6 million euros at the end of 2017, which are not included in the order intake or backlog. Around 79 percent of the order backlog as of the end of December 2017 will impact on revenue in 2018.

Following very positive business performance in 2017, the Optics & Life Science segment anticipates revenue growth in the mid single-digit percentage range in 2018. EBITDA is due to remain stable at the high level seen in 2017.

Buoyed by the major orders it has secured, the Mobility segment is anticipating revenue growth in the lower double-digit percentage range in the current fiscal year. EBITDA is expected to grow significantly. The accuracy of the forecast is influenced by the time at which traffic safety projects are settled.

In the 2018 fiscal year, the Defense & Civil Systems segment is due to bolster our corporate success with stable revenue and EBITDA contributions.

Group Asset and Financial Position Forecast

For the 2018 fiscal year, Jenoptik is forecasting an increase in capital expenditure to over 40 million euros. Capital expenditure on property, plant, and equipment will focus on the growth areas within the segments or take place within the scope of new customer projects. It aims to expand capacities, thereby ensuring future growth.

We are expecting free cash flow in 2018 to slightly exceed the 2017 figure. Even considering the rise in capital expenditure, this will allow all interest, tax, and dividend payments to be covered by the free cash flow.

In 2017, Jenoptik paid out a dividend for the 2016 fiscal year in the amount of 0.25 euros per share. In addition to financing

T47 Summary of Targets for Group and Segments (in million euros)

	Actual 2017	2018 guidance
Revenue	747.9	Between 790 and 810 million euros
Optics & Life Science	259.4	Growth in the middle single-digit percentage range
Mobility	270.1	Growth in the lower double-digit percentage range
Defense & Civil Systems	219.3	Stable
EBITDA/EBITDA margin	106.7/14.3%	EBITDA margin between 14.5 and 15.0 percent
Optics & Life Science	58.7	Stable at high level
Mobility	27.9	Marked rise
Defense & Civil Systems	23.8	Stable
EBIT/EBIT margin	77.8/10.4%	EBIT margin between 10.5 and 11.0 percent
Order intake	802.9	Stable (2017 includes operational one-off effect)
Free cash flow	72.2	Slightly above 2017 figure
Capital expenditure ¹⁾	37.9	Over 40 million euros

¹⁾ Without capital expenditure on financial investments



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

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 company value as well as the exploitation of opportunities for acquisitions are also of crucial importance to the interests of the shareholders.

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 2018 fiscal year, the Jenoptik Group will begin rolling out its “Strategy 2022”, concentrating on photonic technologies. In terms of economic development, our key focus remains on profitable growth. We believe that revenue growth, resulting economies of scale, more efficient and faster processes, and higher margins result in higher, stable earnings.

Building on strong demand in our markets and a solid order backlog, Jenoptik plans to grow successfully again in 2018. The good asset position and a viable financing structure also give sufficient room for maneuver to carry out acquisitions and finance further growth. In 2018, the Executive Board is forecasting revenue of between 790 and 810 million euros and an EBIT margin of between 10.5 and 11.0 percent. The EBITDA margin is due to come in at between 14.5 and 15.0 percent. Achieving these targets is dependent on economic and political conditions.

In 2018, 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.

Overall, the Executive Board expects positive corporate development within the Jenoptik Group during the 2018 fiscal year.

Jena, March 8, 2018

JENOPTIK AG
the Executive Board