Merck KGaA,
Darmstadt, Germany

Half-Year Financial Report

2nd QUARTER 2017

DISCLAIMER

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This half-year financial report contains certain financial indicators such as operating result (EBIT), EBITDA, EBITDA pre exceptionals, business free cash flow (BFCF), free cash flow, net financial debt and earnings per share pre exceptionals, which are not defined by International Financial Reporting Standards (IFRS). These financial indicators should not be taken into account in order to assess the performance of the Group in isolation or used as an alternative to the financial indicators presented in the consolidated financial statements and determined in accordance with IFRS.

The figures presented in this half-year financial report have been rounded. This may lead to individual values not adding up to the totals presented.

The Annual Report for 2016 has been optimized for mobile devices and is available on the Web at **ar2016.emdgroup.com**

IN BRIEF

GROUP

Key figures

€ million	Q2 2017	Q2 2016	Change	Jan.–June 2017	Jan.–June 2016	Change
Net sales	3,891	3,805	2.3%	7,752	7,470	3.8%
Operating result (EBIT)[1]	628	550	14.0%	1,382	1,399	–1.2%
Margin (% of net sales)[1]	16.1%	14.5%		17.8%	18.7%	
EBITDA[1]	1,008	1,069	–5.8%	2,210	2,351	–6.0%
Margin (% of net sales)[1]	25.9%	28.1%		28.5%	31.5%	
EBITDA pre exceptionals[1]	1,093	1,158	–5.6%	2,334	2,242	4.1%
Margin (% of net sales)[1]	28.1%	30.4%		30.1%	30.0%	
Profit after tax	423	314	34.6%	946	907	4.3%
Earnings per share (€)	0.97	0.72	34.7%	2.17	2.08	4.3%
Earnings per share pre exceptionals (€)[1]	1.54	1.55	–0.6%	3.34	3.09	8.1%
Business free cash flow[1]	1,036	799	29.7%	1,796	1,562	15.0%

[1] Not defined by International Financial Reporting Standards (IFRS).

GROUP

Net sales by quarter

€ million

GROUP

EBITDA pre exceptionals[1] by quarter

€ million

[1] Not defined by International Financial Reporting Standards (IFRS).

OUR SHARES

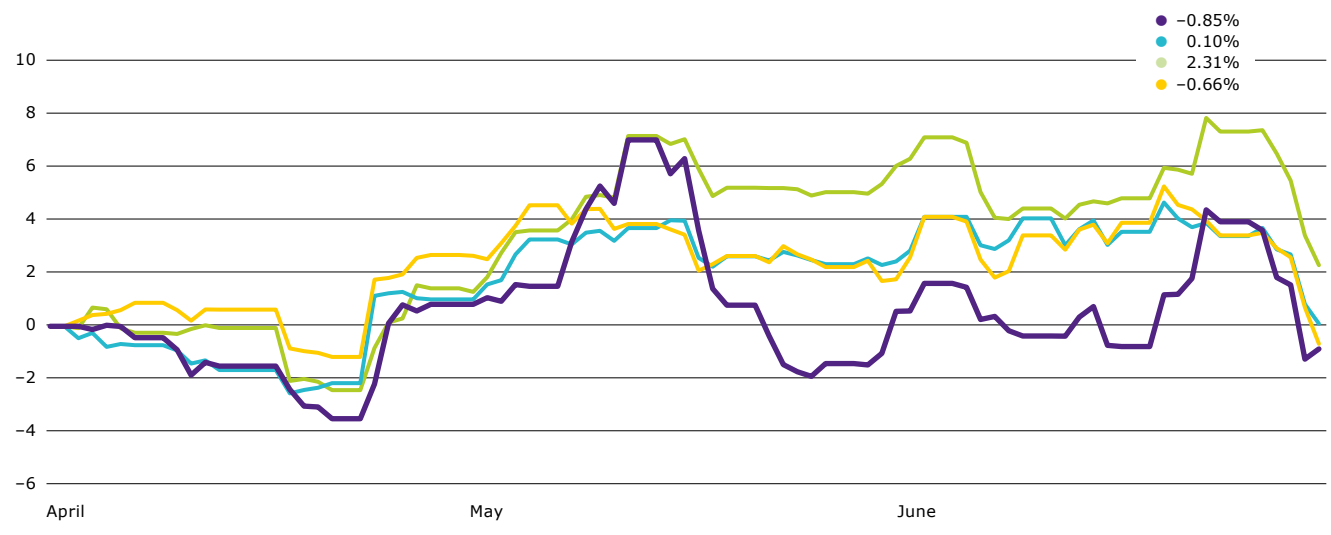
At a glance

In the second quarter of 2017, our share price declined slightly by –0.85%. After closing at € 106.73 on March 31, our shares initially increased to a new all–time high of € 114.25 on May 12, 2017. Yet by the end of the quarter, the share price had decreased to € 105.82, thus roughly returning to the level at the beginning of the quarter. The development of our share price was thus 100 basis points weaker than that of the comparative index DAX®, which posted a slight increase during the second quarter of 2017. The share price of Merck KGaA, Darmstadt, Germany, underperformed the relevant chemical industry index by around 20 basis points and was more than 300 basis points weaker than the relevant comparative pharmaceutical industry index, which rose by 2.3% during the same period.

The positive performance of our shares in the first quarter initially continued until the middle of the second quarter. This was attributable both to a favorable market environment and to company announcements that resonated well with investors and analysts. Among other things, this included the planned divestment of our Biosimilars business to Fresenius on April 24, 2017 as well as the marketing authorization of our immunotherapy Bavencio® (avelumab) for the treatment of patients with locally advanced or metastatic urothelial carcinoma by the U.S. Food and Drug Administration (FDA) on May 9, 2017. However, in the second half of the quarter, our shares underwent a noticeable price correction. Following the announcement of good business figures for the first quarter as well as more specific guidance for the further development of the Group in 2017 which was in line with market expectations, considerable profit-taking activity set in for a period of time. In particular, increased competition in China for liquid crystal materials in our Performance Materials business created uncertainty among investors and analysts in the following weeks. This led to a reduction in their earnings expectations, which negatively impacted our shares both in absolute terms and relative to the relevant comparative indices. In June 2017, we presented clinical data on key pipeline products at the American Society of Clinical Oncology (ASCO) Annual Meeting 2017 in Chicago, Illinois (USA) as well as in a conference call. The data were well received by market participants, as was the positive opinion from the Committee for Medicinal Products for Human Use (CHMP) of the European Medicines Agency (EMA) on June 23, 2017 regarding the marketing authorization application for cladribine tablets (proposed tradename: MAVENCLAD™ for the treatment of relapsing multiple sclerosis in patients with high disease activity. However, owing to rising

OUR SHARES

Share price development from April 1, 2017 to June 30, 2017



Source: Bloomberg (closing rates)

Merck KGaA, Darmstadt, Germany
DAX®
MSCI European Pharma Index
Dow Jones European Chemical Index

interest rates in major capital markets towards the end of the quarter, the environment for equities became more challenging. This trend also affected our shares.

Our Executive Board and Investor Relations team gave in-depth briefings to more than 230 investors during the second quarter, at several investor conferences as well as during roadshows and conference calls. With this, we further strengthened our presence in the financial markets compared with the previous year.

However, the average daily trading volume of our shares continued to decline noticeably. It fell by approximately 30% from 544,000 shares in the second quarter of 2016 to 379,000 in the second quarter of 2017.

In the first half of 2017, the our share price rose by nearly 7%, which was mainly driven by the persistently strong development in the first quarter. The share price performance was nearly 1 percentage point lower than the DAX® and 2 percentage points lower than the comparative pharmaceutical industry index, yet almost 2 percentage points higher than the relevant chemical industry index.

FUNDAMENTAL INFORMATION ABOUT THE GROUP

The Group

We are a global science and technology company headquartered in Darmstadt, Germany. We operate globally under our corporate brand – the only exceptions are Canada and the United States. In these countries, we operate as EMD Serono in the Biopharma business, as MilliporeSigma in the Life Science business, and as EMD Performance Materials in the materials business.

With a history of nearly 350 years, we are the world's oldest chemical and pharmaceutical company. Our product portfolio ranges from innovative pharmaceuticals and biopharmaceutical products to life science tools, specialty chemicals, and high-tech materials. In line with our strategic direction, our company comprises three business sectors: Healthcare, Life Science, and Performance Materials.

On May 16, 2017, we announced plans to purposefully develop the structures at the Darmstadt site further. The aim is to be able to benefit in the best possible way from the global growth opportunities of the three business sectors over the long term. For this purpose, the company will relaunch the enterprise resource planning systems. To date, these have primarily been optimized for the requirements at the Darmstadt site but only support global needs of the business sectors to a limited extent. Three customized enterprise resource planning (ERP) systems are to be set up for the three business sectors Healthcare, Life Science and Performance Materials. To this end, we are examining the company legal structures at the site, particularly the establishment of subsidiaries under the roof of Merck KGaA, Darmstadt, Germany, to run the individual businesses and their ERP systems.

Our company had 52,233 employees worldwide on June 30, 2017, which compares with 50,456 on June 30, 2016.

A detailed description of Merck KGaA, Darmstadt, Germany, and its business sectors can be found in the Annual Report for 2016 starting on page 47. This section of the present half-year financial report summarizes the highlights of the first half of 2017 at Merck KGaA, Darmstadt, Germany.

GROUP

Sales by business sector – Q2 2017

€ million/% of net sales

GROUP

EBITDA pre exceptionals[1] by business sector[2] – Q2 2017

€ million/in %

[1] Not defined by International Financial Reporting Standards (IFRS).

[2] Not presented: Decline in Group EBITDA pre exceptionals by € –80 million due to Corporate and Other.

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Business free cash flow[1] by business sector[2] – Q2 2017

€ million/in %

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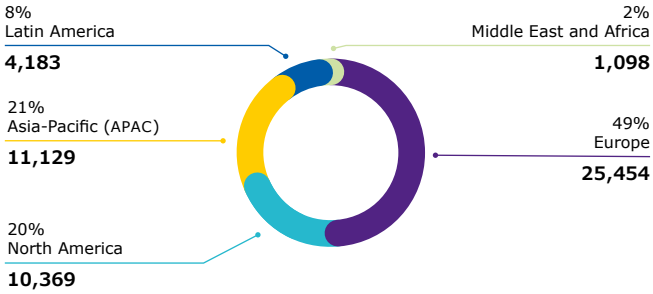
Employees by region as of June 30, 2017

Number/in %



[1] Not defined by International Financial Reporting Standards (IFRS).

[2] Not presented: Decline in Group EBITDA pre exceptionals by € –93 million due to Corporate and Other.

Healthcare

Our Healthcare business sector comprises the Biopharma, Consumer Health, Biosimilars, and Allergopharma businesses. The share of Group sales attributable to our Healthcare business sector was 46% in the second quarter of 2017 and the share of EBITDA pre exceptionals (excluding Corporate and Other) was 41%.

In April, we announced a collaboration with Drugs for Neglected Diseases initiative (DNDi) to accelerate the research process and reduce costs in finding new treatments for the neglected tropical diseases (NTDs) leishmaniasis and Chagas disease, which 450 million people are at risk of contracting. DNDi is a collaborative, patient-needs-driven, non-profit drug research and development organization for neglected diseases. In collaboration with five other pharmaceutical companies, we are opening our compound library to DNDi to help find cures for these diseases. By joining DNDi, we are also reinforcing our commitment to the London Declaration, an unprecedented public-private multi-stakeholder partnership to catalyze momentum in reaching World Health Organization (WHO) 2020 NTD goals to control, eliminate or eradicate 10 NTDs, including leishmaniasis and Chagas disease. When the partnership was launched in 2012, we pledged up to a tenfold increase in our praziquantel donation to fight schistosomiasis, the worm disease, until its elimination. Between 2012 and 2016, we increased our donation from 25 million to 200 million tablets. At least 218 million people needed treatment in 2015, with 90% residing in Africa.

In June, we announced the establishment of our corporate Foundation. This new Foundation aims to improve health and well-being of people in developing countries and underserved communities. With our corporate Foundation we will continue our commitment towards improving access to innovative healthcare solutions in underserved communities, building healthcare and scientific research capacity and advancing people's lives through science and technology. The Foundation will focus on initiatives that will contribute towards the Sustainable Development Goals outlined by the United Nations.

Also in June, our corporate venture arm of our Corporate Ventures fund created iOnctura SA, Geneva, Switzerland. This aims to develop a pipeline of selected assets that target and modulate immunosuppression in the tumor microenvironment. The vision of iOnctura is to improve the clinical efficacy and thereby expand the utility of checkpoint inhibitors. Through its alliances with our company and Cancer Research Technology (CRT), iOnctura has already built a pipeline of promising programs and entered a research collaboration with CRT Discovery Laboratories. In exchange for the exclusive global option to license three immuno-oncology assets from CRT, iOnctura will provide CRT with an initial equity holding in the company and will make further payments for the achievement of late development and approval milestones as well as royalties on net sales.

BIOPHARMA

Immuno-Oncology

During the first half of 2017, the U.S. Food and Drug Administration (FDA) approved Bavencio®, our human anti-PD-L1 antibody in two indications, metastatic Merkel cell carcinoma and metastatic urothelial carcinoma (please refer to the R&D section below for details). Bavencio® is being co-commercialized in these indications by EMD Serono, the biopharmaceutical business of Merck KGaA, Darmstadt, Germany, in the United States, and Pfizer.

Oncology

In early March, the UK National Institute for Health and Care Excellence (NICE) issued a positive Final Appraisal Determination (FAD) recommending the routine National Health Service (NHS) use of Erbitux® (cetuximab) in combination with either FOLFIRI or FOLFOX as a first-line treatment for patients with RAS wild-type metastatic colorectal cancer (mCRC). This decision expands the previous NICE recommendation, which endorsed the use of Erbitux® in combination with either FOLFOX or FOLFIRI solely for patients whose cancer had spread only to the liver (liver-limited disease).

Neurology/Immunology

In June, the Committee for Medicinal Products for Human Use of the European Medicines Agency granted a positive opinion on cladribine tablets in patients with relapsing multiple sclerosis with high disease activity (please refer to R&D section for details).

Fertility

In January, we opened our first Center of Excellence (CoE) for fertility, an international state-of-the-art facility for high-quality training of healthcare professionals, such as physicians and embryologists, to improve clinical practices, protocols and clinical outcomes.

During the first half of 2017 we received regulatory approval for the new Pergoveris® pen in Europe (please refer ti the R&D section for details).

In March, we announced the release of two advanced fertility technologies: Eeva® Test 3.0 and Geri™ humidified incubation products for improved efficiency in assisted reproductive treatment (ART). These first-in-class technologies will provide embryologists with in-depth information and control over the environment in which the embryo grows to support healthy embryo development and assessment.

Collaborations

Early in the first half of 2017, we announced important collaboration and cooperation agreements. We entered a cooperation with Palantir Technologies Inc., based in Palo Alto, California, to leverage Palantir's advanced data analytics capabilities, aiming to commercialize new products and improve patient outcomes. Initially we intend to apply Palantir's technology to cancer treatment and patient services.

We also entered a three-year strategic collaboration with the University of Texas MD Anderson Cancer Center. Through the collaboration we will gain access to a research platform that standardizes the long-term collection of patient medical history and data derived from tissue samples. The collaboration will encompass both biomarker-focused preclinical research and clinical trials in specific tumor types.

Other developments

On June 29, 2017, we inaugurated a state-of-the-art packaging building for biotechnology medicines at our Aubonne, Switzerland manufacturing site. The new building will be dedicated to the visual inspection, packaging and shipping of our current portfolio of biotech medicines in more than 150 countries. It will also provide capacity for ongoing and further potential future product launches.

With its optimized flow, fully automated equipment and robotized logistics, the new packaging building will process more than 12 million boxes of medicines and 4 million injection devices every year. It is designed to comply with the highest international standards in terms of quality, environment, health and safety

CONSUMER HEALTH

On June 22 and 23, 2017, we inaugurated our new manufacturing site in Spittal, Austria. The 4,500-square-meter facility, which cost € 7.5 million, will make possible a 36% increase in the production of tablets, to three billion per year. The expansion has led to the creation of 50 new jobs, for a total of 450 at the site. We also plan to complete a new product development laboratory at this location by year-end with which we intend to ensure our innovative leadership in tablets and ointments.

BIOSIMILARS

On April 24, 2017, we announced the divestment of the Biosimilars business to Fresenius. The decision is in line with the strategy of our Healthcare business sector to focus on its pipeline of innovative medicines. The closing is expected in the third quarter of 2017.

ALLERGOPHARMA

In March, our allergy business Allergopharma opened a new biopharmaceutical production in Reinbek, near Hamburg. This € 42 million investment is part of our global expansion and will support our growing business in the allergy marketplace.

Life Science

After successfully orchestrating the largest integration in the history of our company, Life Science redesigned its organizational structure in the second quarter of 2017 to capture growth opportunities even more strongly. With this realignment, Life Science will be able contribute towards and take advantage of the strength of the Group. SMIs (Strategic Marketing & Innovation units) and commercial teams have been organized into three distinct, vertically integrated business units: Research Solutions, Process Solutions and Applied Solutions, with each designed to increase agility and drive sustained entrepreneurship to better serve our customers.

In the first half of 2017, the share of Group sales attributable to our Life Science business sector was 38% and the share of EBITDA pre exceptionals was 39%.

In the first half of 2017, Life Science made two acquisitions, aligning with its strategy to expand in key geographies and drive a differentiated customer experience. In January, we announced the acquisition of BioControl Systems Inc., a global leader in food safety testing. BioControl's established rapid detection technology and third-party validated testing platforms complement our portfolio of instruments and consumables geared to the food pathogen testing workflow in the Applied Solutions business area. In May, we acquired Grzybowski Scientific Inventions (GSI) to expand chemical synthesis offerings. GSI has developed a revolutionary computer-aided retro-synthesis tool that uses advanced reaction rules and proprietary algorithms to identify synthesis pathways that meet user-defined constraints.

Earlier in the year, we expanded our end-to-end biodevelopment centers in North America, China and Europe to meet increasing global demand for end-to-end process development solutions. The expansion, which included the opening of two new process development centers in the United States and China, follows on the commercial success of our biodevelopment center in Martillac, France – a full single-use, GMP facility for manufacturing clinical stage batches.

We also continued to focus on sustainability in biology and chemistry. In this context, Cyrene™, a biosolvent we developed in partnership with the Chemistry Centre of Excellence at the University of York and Circa Group, was named the European Bio-Based Chemical Innovation of the Year 2017 as a greener alternative to petroleum-based dipolar aprotic solvents such as DMF and NMP. In addition, we published an article on quantifying green chemistry in ACS Sustainable Chemistry & Engineering; "A method for Assessing Green Alternatives between Chemical Products Following the 12 Principles of Green Chemistry."

In May, we announced the development of an alternative CRISPR genome-editing method, called proxy-CRISPR, which can cut previously unreachable cell locations, giving researchers more experimental options. In June, we were awarded our first CRISPR patent by the Australian patent office, covering the successful integration of an external DNA sequence into the chromosome of eukaryotic cells using CRISPR. Our company has a 14-year history in the genome-editing field.

Performance Materials

Our entire specialty chemicals business is combined in our Performance Materials business sector. The portfolio includes high-tech chemicals for applications in fields such as consumer electronics, lighting, coatings, printing technology, paints, plastics, and cosmetics. Performance Materials comprises four business units: Display Materials, Integrated Circuit Materials, Pigments & Functional Materials, and Advanced Technologies.

The business sector's share of Group sales amounted to 16% and its share of EBITDA pre exceptionals (excluding Corporate and Other) was 20% in the second quarter of 2017. The EBITDA margin pre exceptionals amounted to 39.1% of sales.

In the second quarter of 2017, we defended our position as the global market and technology leader for established liquid crystal technologies – despite increasing competition in this segment. Large – mainly Asian – display manufacturers are among the customers of our Liquid Crystals (LC) business. At SID Display Week 2017, the world's largest exhibition for the electronic display industry held in Los Angeles, we presented a broad portfolio of established liquid crystal technologies. Materials such as the new liquid crystal technology SA-VA (self-aligned vertical alignment), which makes production processes eco-friendlier and more efficient, attracted a great deal of interest. The focus was also on materials that offer consumers a better user experience, such as those for free-form, color-intensive, high-contrast and energy-efficient displays. To accelerate the development of free-form displays, we are cooperating with Flexanable of the United Kingdom. This company recently achieved a breakthrough with free-form, large-area, full-color and video-capable liquid crystal displays (LCD) on polymer substrates.

The development of new application possibilities for liquid crystals remains an important focus of our LC 2021 strategic initiative. This primarily includes the development of liquid crystal window technology. In order to protect against solar radiation, these windows allow continuously variable switching from light to dark in just seconds and have high color neutrality compared with competitive technologies. The privacy variant of the windows allows switching from transparent to opaque. We successfully presented liquid crystal window technology at BAU, the world's leading trade fair for architecture, materials and systems in January 2017 in Munich, as well as at Glass Performance Days in Tampere, Finland at the end of June. To achieve faster market penetration of the new technology, we are investing around € 15 million in a production facility for liquid crystal window modules at a site in Veldhoven in the Netherlands. The manufacture of these switchable modules is scheduled to begin there at the end of 2017.

Integrated Circuit Materials is our second-largest business unit and supplies products to manufacture integrated circuits and microelectronic systems, for antireflection coatings, and for the miniaturization of transistor structures. Deposition materials and conductive pastes for semiconductor packaging round off the portfolio. As an important partner to leading global electronics manufacturers, we achieved further strong growth and gained market shares in the second quarter – amid an overall positive development of the semiconductor market. At industry events such as the international trade show for semiconductor technology Semicon Korea and the SPIE Photonics West in San Francisco, California, we impressed visitors with our portfolio expanded by the acquisitions of SAFC Hitech and Ormet Circuits.

The Pigments & Functional Materials business unit develops and markets a comprehensive product portfolio of decorative effect pigments and functional materials. Our effect pigments are primarily used in automotive and industrial coatings, plastics, printing applications, and cosmetics in order to give products a unique shine. Functional materials include laser marking, conductive additives, applications for counterfeit protection as well as high-quality cosmetic active ingredients, for example for use in skin care, as well as sun protection and insect repellants. Since the beginning of 2017, we have been offering Xirallic® NXT Cougar Red as a new product for coating applications. It belongs to the improved product generation of the well-known high-tech effect pigments and stands out due to an attractive bluish red and very intense glitter. We have developed a special clear coat for new effect dimensions in automotive coatings in cooperation with Daimler, the coatings specialist PPG Industries and the Fraunhofer Institute for Manufacturing Engineering and Automation. This new development, which was presented at the end of June at Sucar, the international conference on automotive body finishing in Cannes, France, can significantly intensify the effect on existing OEM base coats, making it possible to create completely new color tones.

In the second quarter, we announced a strategic partnership with Schmid Rhyner of Switzerland for our innovative 3D effect printing technology. The aim is to further develop this innovative printing process with effect pigments for various surfaces and markets. At the beginning of 2017, we added Tivida® FL 3000 to our portfolio of fluorosurfactants. It differentiates itself from competitive products on account of its favorable ecotoxicological profile, and even in very low concentrations it significantly improves the flow and wetting behavior of coating systems. At the Laser World of Photonics 2017 exhibition in June, we presented a new pigment for laser marking in a new application field. Iriotec® 8826 is particularly suitable for dark and high-contrast marking of colored polymers and for the first time enables the laser marking of films. Besides materials for technical applications, we are working on innovative materials for cosmetics. Two new raw materials complement our portfolio: RonaCare® Pristine Bright liquid, a liquid variant of an active ingredient that makes the skin appear naturally lighter, and an alcohol-free variant of the anti-aging active ingredient RonaCare® CP5.

The Advanced Technologies business unit invests particularly in future-oriented research and development in Performance Materials. A very good example of this are our materials for organic light-emitting diodes (OLEDs). The OLED materials business is one of our fastest-growing businesses. We are intensively working to improve materials for televisions. Brighter displays and a larger color spectrum are two areas of focus. The growing popularity of curved displays for mobile telephones is creating new impetus in the OLED market. We continue to invest heavily in OLED technology and is excellently positioned. The capacities at the application laboratory in Korea are to be doubled in 2017. Apart from the use of OLED materials in displays, we continue to target the lighting market. In particular, OLED tail lights for cars are an interesting application – various automobile manufacturers have presented these high-quality tail lights at exhibitions.

High-quality phosphors are used for the backlighting of liquid crystal displays. We launched our new full-spectrum phosphors for application in violet chip-based LEDs. They are very luminous and achieve a high color rendering index and a spectrum that comes very close to natural sunlight.

In the field of organic photovoltaics, more and more pilot projects are demonstrating the manifold applications of the technology in architecture. In initial construction projects in Europe and Brazil, printed solar foils turn glass façades and canopies into active power generators. In January, we received the Innovation Award Architecture + Building at the BAU 2017 for its organic photovoltaic modules developed in cooperation with Belectric OPV.

Objectives and Strategies

We want to advance technologies for a better life. Based on scientific research and in collaboration with partners, we are focusing on specialty products in healthcare, life science and performance materials.

General principles and Group strategy

General principles

We are a vibrant science and technology company. Our aim is to achieve technological progress that will improve life and make our customers and business associates more successful. This aspiration is embodied by values-based and economically sustainable corporate governance, has been anchored in our new brand promise since 2015, and steers the strategic development of the Group.

Our annual strategic planning process follows firmly defined principles. Our business portfolio must always be balanced so that it reflects an optimum mix of entrepreneurial opportunities and risks. We achieve this through our diversification into three complementary business sectors that make the company as a whole less dependent on economic cycles, as well as by expanding our presence in global growth markets. This exemplifies the long-term direction of our Group strategy. We want to continue the nearly 350-year-old success story of our company into future generations and to achieve sustainable profitable growth. The partner structure of Merck KGaA, Darmstadt, Germany, with members of the Merck family as personally liable partners also contributes to this. It requires the Executive Board, whose members are also personally liable partners, to pay special attention to the long-term development of value.

For us, the principle of sustainability applies not only to economic aspects, but also encompasses corporate responsibility. We pursue three strategic spheres of activity: health, the environment and culture. The focus is always on the future viability of society and the competitiveness of our company. With our current and future product portfolio, we want to help solve global challenges, from urbanization to aging populations.

Group strategy

Over the past decade, our company has transformed itself from a classic supplier of chemicals and pharmaceuticals into a global science and technology company. The main driver was the transformation of our business portfolio, particularly through the divestment of our Generics business (2007) and the acquisitions of Serono (2007), Millipore (2010), AZ Electronic Materials (2014), and Sigma-Aldrich (2015). In addition, we focused our businesses on innovation-driven and highly specialized products, extensively revamped our internal structures and processes, and expanded our presence in global growth markets.

Today, we hold leading positions in the respective markets of our three business sectors Healthcare, Life Science and Performance Materials, and are working to bolster and expand these. To this end, we are pursuing innovation-driven, organic growth. For instance, by 2022 we are targeting sales of around € 4 billion with new products. New medicines from the pharmaceutical pipeline are to contribute around € 2 billion, with Life Science and Performance Materials innovations each contributing around € 1 billion in sales.

Targeted acquisitions capable of meaningfully complementing or boosting our strengths remain a growth option. However, we continue to rule out major acquisitions of more than € 500 million as long as the debt level expressed as the ratio of net financial debt to EBITDA pre exceptionals is greater than 2, unless divestments could be used to finance them. By 2018, we aim to reduce our debt level to below 2 again.

Our Group strategy aims to resolutely continue the transformation of our company into a specialized technology company and to position the company as a leading player in a changing market environment. For this purpose, we set up the Group Strategy & Transformation function in 2016. It unites the previously separately managed units Strategy, Innovation and Digitalization, and is designed to ensure the successful and timely implementation of core strategic projects. We have assigned these projects to three areas of key priority, namely “Performance”, “People” and “Technology”.

"Performance" encompasses all activities that create sustainable, profitable growth. To this end, we are closely aligning our businesses with the wishes and needs of customers and patients, not only through our products, but also best possible proximity. The basis for this is formed by efficient structures and processes as well as sustainable financial management. "Performance" is illustrated by the rapid and seamless integration of Sigma-Aldrich into our Life Science business as well as the realization of the associated synergies. We have progressed here faster than planned. In addition, previously unplanned top-line synergies are expected to contribute an additional € 20 million to earnings by the end of 2018. Consequently, total synergies from the Sigma-Aldrich acquisition will amount to € 280 million instead of originally € 260 million per year.

Our growth strategy calls for a work culture that values diversity, promotes collaboration and responds flexibly to changing requirements. That's because in today's global knowledge society, qualified and motivated people are a crucial factor for entrepreneurial success, especially in a science and technology company like ours. As a key priority area, "People" includes the further development of people management practices and creating an environment where innovation and creativity can thrive. We are paying particularly close attention to our leadership culture, talent pipeline and strengthening collaboration across national and departmental borders, for example through flexible work models or the use of a modern communication infrastructure.

The priority area "Technology" covers the closely interlinked areas of innovation and digitalization. Developing and marketing innovative products and services are at the forefront of our Group strategy and all the business strategies. Our objective is to foster innovations both within the businesses and between them as well as beyond existing businesses into areas in which we are not yet active.

In particular, we want to capture the opportunities that digitalization offers in order to create value for customers, business associates and patients. To us, digitalization means the digital integration of our entire value chain, the digitalization of our products, services and communication interfaces to customers as well as the development of new digital business models. This is supported by state-of-the- art methods to collect and analyze vast amounts of data (Big Data). Additionally, we are working Group-wide to expand the physical and virtual infrastructure for technology-driven growth. The centerpiece will be formed by the Innovation Center in Darmstadt. Currently under construction, this 7,000 m^2 building is scheduled for completion by the end of 2017. Until its opening, our modular Innovation Center, which opened in 2015, offers a platform for the development of new technologies, for instance within the scope of our Accelerator program. Through this initiative and our expertise in science and technology, we support start-ups in transforming their visions into viable business models.

In 2016, we expanded our existing Biopharma venture fund to all three business sectors, increasing the total funding volume to € 300 million. Additionally, businesses beyond our current portfolio represent the fourth investment arm of the new Corporate Ventures fund.

Capability initiatives

In 2013, we introduced four capability initiatives. They address topics that are of strategic importance to the performance of the entire company: The capability initiatives ONE brand, ONE Talent Development, Rewards, and Performance Management, ONE Process Harmonization, and ONE Global Headquarters continue to drive important change or have started to evolve into regular activities. In October 2015, we introduced a fundamental revision of our brand design along with a simplified brand architecture, which we are currently implementing globally at all levels. In this context, we launched the digital brand campaign in 2016 called "Break- throughs begin with curiosity" (curiosity.emdgroup.com), which puts the spotlight on scientific curiosity and passion for discovery as the driving forces of innovations.

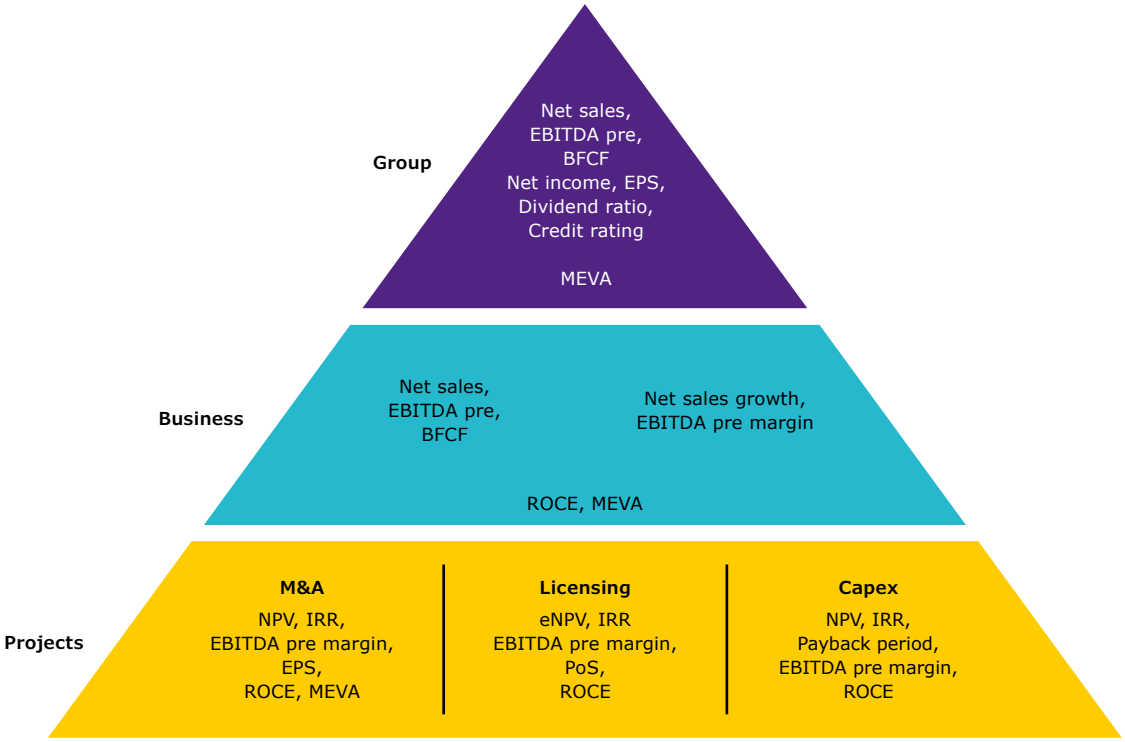
More information about the objectives and strategies of Merck KGaA, Darmstadt, Germany, can be found on pages 54 to 59 of the Annual Report for 2016

Internal Management System

As a global company with a diverse portfolio of products and services, we use a comprehensive framework of indicators to manage performance. The most important KPI (key performance indicator) to measure performance is EBITDA pre exceptionals[1].

The Value Creation and Financial KPI Pyramid, which summarizes the important financial performance measures[1] of the Group, reflects the comprehensive framework of financial KPIs to steer the businesses and prioritize the allocation of cash resources. It consists of three managerial dimensions, namely Group, Business and Projects, each of which require the use of different indicators.

A detailed description of our Internal Management System can be found in the Annual Report for 2016 starting on page 60.



Abbreviations
EBITDA pre = Earnings before interest, income tax, depreciation and amortization pre exceptionals
EPS = Earnings per share
MEVA = Value added of Merck KGaA, Darmstadt, Germany
BFCF = Business free cash flow
ROCE = Return on capital employed
NPV = Net present value
IRR = Internal rate of return
eNPV = expected Net present value
PoS = Probability of success
M&A = Mergers and acquisitions

[1]Some not defined by International Financial Reporting Standards (IFRS).

Key performance indicators of the Group and its businesses

The three key performance indicators net sales, EBITDA pre exceptionals, and business free cash flow[1] are the most important factors for assessing operational performance. Therefore, we refer to these KPIs in the Report on Economic Position, the Report on Risks and Opportunities, and in the Report on Expected Developments. As the most important indicators of financial business performance, the KPIs are key elements of our performance management system.

Net sales

Net sales are defined as the revenues from the sale of goods and services rendered to external customers net of value added tax and after sales deductions such as rebates or discounts. Net sales are the main indicator of our business growth and therefore an important parameter of external as well as internal performance measurement. In addition, acquisition and currency-adjusted sales are used for internal performance management.

EBITDA pre exceptionals

EBITDA pre exceptionals is the main performance indicator measuring ongoing operational profitability and is used internally and externally. To allow for a better understanding of the underlying operational performance, it excludes from the operating result depreciation and amortization as well as exceptionals. Exceptionals are restricted to the following categories: impairments, integration costs/IT costs, restructuring costs, gains/losses on the divestment of businesses, acquisition costs, and other exceptionals. The classification of specific income and expenses as exceptionals follows clear definitions and underlies strict governance at Group level. Within the scope of internal performance management, EBITDA pre exceptionals allows for the necessary changes or restructuring without penalizing the performance of the operating business.

Business free cash flow (BFCF)

Business free cash flow comprises the major cash-relevant items that the individual businesses can influence and are under their full control. It comprises EBITDA pre exceptionals less the change in the opening and closing amounts reported in the balance sheet for investments in property, plant and equipment, software, advance payments for intangible assets, as well as the change in inventories and trade accounts receivable. To manage working capital on a regional and local level, the businesses use the two indicators days sales outstanding and days in inventory.

[1]Not defined by International Financial Reporting Standards (IFRS).

Research and Development

We conduct research and development (R&D) worldwide in order to develop new products and services designed to improve the quality of life of patients and to satisfy the needs of our customers. Further optimizing the relevance and efficiency of our research and development activities – either on our own or in cooperation with third parties – is one of our top priorities.

We research innovations to serve long-term health and technology trends in both established and growth markets. We spent more than € 1 billion on research and development in the first half of 2017.

We focus on both in-house research and external collaborations. Our R&D activities are set up in line with the structure of our company with three business sectors. A detailed description of our R&D activities can be found in the Annual Report for 2016 starting on page 72. This section of the present half-year financial report summarizes the key research and development activities during the first half of 2017.

Healthcare

BIOPHARMA

Immuno-Oncology

On March 23, 2017, we announced that the U.S. Food and Drug Administration (FDA) had approved avelumab injection 20 mg/ml under the brand name Bavencio®, for intravenous use, for the treatment of adults and pediatric patients 12 years and older with metastatic Merkel cell carcinoma (mMCC). This indication is approved under accelerated approval based on tumor response and duration of response. Continued approval for this indication may be contingent upon verification and description of clinical benefit in confirmatory trials. Bavencio® was developed, reviewed and approved through the FDA's Breakthrough Therapy Designation and Priority Review programs. Bavencio® is a human anti-PD-L1 antibody, discovered in our labs, and is the first FDA-approved therapy for patients with mMCC. The latter is a rare and aggressive skin cancer, with fewer than half of patients surviving more than one year and fewer than 20% surviving beyond five years.

On February 28, 2017, we announced that the U.S. FDA had accepted for Priority Review the Biologics License Application (BLA) for avelumab, as a treatment for patients with locally advanced or metastatic urothelial carcinoma (mUC) with disease progression on or after platinum-based chemotherapy. On May 9, we announced that the U.S. FDA had approved avelumab in this indication. Bladder cancer makes up approximately 90% of urothelial cancers and is the sixth most common cancer in the United States.

At the 53rd American Society of Clinical Oncology (ASCO) Annual Meeting held June 2–6, 2017 in Chicago, we announced results from our growing broad oncology portfolio, from immuno-oncology to DNA damage response (DDR) approaches, in a broad range of hard-to-treat cancers. Over 40 abstracts showcased the impact of our commitment to shaping cancer care today and tomorrow, including data for avelumab, which is being developed in collaboration with Pfizer, Erbitux® (cetuximab), and pipeline updates on the anti-PD-L1/TGF-ß trap M7824, the DNA-PK inhibitor M3814, the BTK inhibitor M7583, and the c-Met inhibitor tepotinib.

Multiple avelumab presentations at ASCO included data in first-line metastatic Merkel cell carcinoma and previously treated metastatic urothelial carcinoma, as well as results from the Phase Ib trial of avelumab in combination with axitinib in renal cell carcinoma (RCC). Avelumab is currently being evaluated as both monotherapy and combination therapy in an extensive clinical development program. Beyond mMCC, locally advanced or metastatic UC and RCC, further avelumab abstracts in non-small cell lung cancer and metastatic castrate-resistant prostate cancer, locally advanced squamous cell carcinoma of the head and neck, relapsed or refractory diffuse large B-cell lymphoma were also presented.

We also featured new research at ASCO on our investigational bifunctional immunotherapy anti-PD-L1/TGF-ß trap (M7824), which is thought to simultaneously block both PD-L1 and TGF-ß. An oral presentation showcased dose escalation Phase I clinical data exploring the potential of M7824 in advanced solid tumors.

Pipeline updates at ASCO also include early clinical results for both tepotinib, an investigational small-molecule inhibitor of the c-Met receptor tyrosine kinase, M7583, an oral, highly selective, covalent inhibitor of Bruton's tyrosine kinase (BTK), and the first clinical data for M3814, an investigational

DNA-dependent protein kinase (DNA-PK) inhibitor. We are investing significant resources in the promising area of DDR to be a leader in this field. Our company has recently in-licensed two promising clinical-stage programs from Vertex.

We continue to evaluate avelumab in cancers that currently have limited treatment choices. The program has now involved more than 5,200 patients across 15 tumor types.

In January, we announced that we had entered into a collaboration and licensing agreement with Domain Therapeutics (Strasbourg, France), to explore the potential of adenosine inhibition in the development of novel immuno-oncology agents. Domain Therapeutics is a company focused on the discovery and development of first-in-class compounds against transmembrane targets, and in particular against G protein-coupled receptors (GPCRs). This collaboration strengthens our combination strategy in immuno-oncology, and underscores our science-driven approach to discovering and developing novel compounds through both internal capabilities and external collaborations.

On June 4, 2017, we announced a new strategic collaboration with the biopharmaceutical company F-star of Cambridge, United Kingdom, for the development and commercialization of five bispecific immuno-oncology antibodies. Beyond these, our company will have further rights to replace, as well as to add to these antibodies using F-star's bispecific antibody platform. This collaboration will further strengthen our company's immuno-oncology pipeline and underscores our commitment to discovering and developing breakthrough cancer therapies that make a meaningful difference to patients' lives.

Oncology

In January, we signed a licensing agreement with Boston-based Vertex Pharmaceuticals that covers the worldwide development and commercialization of four promising research and development programs which represent novel approaches to the treatment of cancer. Our company will receive two clinical-stage programs targeting DNA damage repair, along with two additional novel research programs. We are investing significant resources and aspire to be a leader in this field.

Immunology and Neurology

On June 23, 2017, the Committee for Medicinal Products for Human Use (CHMP) of the European Medicines Agency (EMA) issued a positive opinion for approval of cladribine tablets (proposed tradename MAVENCLAD™) for the treatment of relapsing forms of multiple sclerosis (RMS) in patients with high disease activity. The CHMP positive opinion is based on more than 10,000 patient years of data with over 2,700 patients included in the clinical trial program, and more than ten years of observation in some patients. The clinical development program included data from three Phase III trials, CLARITY, CLARITY EXTENSION and ORACLE MS, the Phase II ONWARD study and long-term follow-up data from the eight-year prospective registry, PREMIERE. The efficacy and safety results of these studies allowed a detailed characterization of the benefit-to-risk profile of cladribine tablets.

In patients with high disease activity, post hoc analyses of the two-year Phase III CLARITY trial demonstrated that cladribine tablets reduced the annualized relapse rate by 67% and the risk of 6-month confirmed EDSS progression by 82% versus placebo. As demonstrated in the Phase III CLARITY EXTENSION study no further cladribine treatment was required in years 3 and 4. The comprehensive dataset has informed the posology and monitoring requirements.

The CHMP's recommendation will be referred to the European Commission, which is expected to make a final decision on the marketing authorization application for cladribine tablets within 67 days of the CHMP opinion.

On June 26, at the European Association of Neurology meeting held in Amsterdam, analyses of data from three clinical studies (CLARITY, CLARITY Extension and ORACLE-MS) were announced which suggest that cladribine tablets selectively and discontinuously reduce both B and T lymphocytes in patients with early and relapsing forms of MS. An early reduction of peripheral blood B cells was seen, with cell numbers reaching a nadir at 13 weeks after treatment, followed by a rapid reconstitution toward baseline. A moderate reduction in T cell counts was also shown, although to a lesser degree than B cells; this reduction was more pronounced in CD4+ than in CD8+ lymphocytes.

We presented data at the American Academy of Neurology (AAN) 69th Annual Meeting (April 22-28, 2017) in Boston, Massachusetts (USA). A total of 15 abstracts on multiple sclerosis (MS), including studies evaluating Rebif® (interferon beta-1a) and investigational cladribine tablets were presented.

During the first half of 2017, a Phase II study was started with M2951, our orally administered BTK inhibitor, in patients with multiple sclerosis. M2951, known under the recommended International Non-proprietary Name evobrutinib, is being investigated as a potential treatment for autoimmune and inflammatory diseases and is now in Phase II development in rheumatoid arthritis, systemic lupus erythematosus, and multiple sclerosis. The evobrutinib development program in MS further contributes to our legacy in MS. With Rebif® (interferon beta-1a) as a current treatment option and the investigational product cladribine tablets in registration, we continue to build on our commitment of making a difference in the lives of patients with MS. Evobrutinib was discovered in our own laboratories and is an example of the innovation of our in-house R&D.

At the end of March, we announced a development agreement with Avillion, a UK-based company focused on increasing R&D output through innovative models, for anti-IL-17 A/F Nanobody®. We have completed Phase I development of our anti-IL-17 A/F Nanobody®, an investigational therapy which is expected to begin Phase II in plaque psoriasis later this year. In a collaboration model that is recently emerging in the biopharma industry, Avillion, which is among the pioneers of such models, will be responsible for developing anti-IL-17 A/F Nanobody® from Phase II through Phase III. Avillion will also finance the clinical program through to regulatory submission. The agreement reflects our strategy of identifying collaborations that progress promising clinical stage assets through novel innovation models, allowing us to focus on several priority clinical assets in our pipeline.

Fertiility

In February, we announced that the European CHMP granted a positive opinion for the new Pergoveris® Pen. This was followed by a European Commission approval in May. The new Pen comprises a ready-to-use liquid version of Pergoveris® which was evolved from a freeze-dried powder and solvent combination available in vials that required patients to mix the product themselves before injection. By eliminating the need for mixing, the new Pergoveris® Pen can provide an improved treatment option for patients with severe follicle stimulating hormone (FSH) and luteinizing hormone (LH) deficiency. The liquid product is the only premixed combination of recombinant human FSH and human LH on the market available in a pre-filled injection device for self-administration.

At a special ceremony held on the occasion of the European Society of Human Reproduction and Embryology (ESHRE), meeting which took place in Geneva, Switzerland, we announced our commitment to award €1.25 million through the Grant for Fertility Innovation (GFI) to external research projects in the field of fertility. The GFI was launched in 2009, and is dedicated to transforming innovative translational fertility research projects into actual solutions aimed at improving fertility treatment outcomes. The two winning projects this year, selected from 46 global proposals, came from Italy (Luisa Campagnolo) and Brazil (Caio Parente Barbosa and Matheus Roque). Professor Bruno Lunenfeld, a speaker at the GFI 2017 ceremony, was honored with our corporate Lifetime Achievement Award for his revolutionary work within the fertility field since 1954. At the ceremony he provided an overview on the discovery and development of human gonadotropins.

General Medicine and Endocrinology

On May 17, 2017, we announced that the Medicines and Healthcare Products Regulatory Agency (MHRA) in the United Kingdom had authorized Glucophage® SR (sustained release formulation; metformin) for the reduction in the risk or delay of the onset of type 2 diabetes in adult, overweight patients with impaired glucose tolerance (IGT) and/or impaired fasting glucose (IFG), and/or increased glycated hemoglobin (HbA1c), when intensive lifestyle changes for three to six months have failed. This condition is referred to by a variety of names in medical guidelines, i.e. as non-diabetic hyperglycemia, as impaired glucose regulation, or as pre-diabetes. We have already received authorization for this indication in several countries around the world. Through earlier intervention, patients can reduce their risk of developing type 2 diabetes as well as complications that can lead to serious health issues.

Life Science

In the first half of 2017, we continued to drive research and innovation, focusing on tackling the most challenging problems in the industry. With more than 1,500 employees working in various R&D functions around the world, Life Science collaborates closely with its customers to translate ideas into product innovations.

Our Life Science business sector launched more than 9,000 products, including nearly 4,000 chemicals, in the first half of 2017. Our Research Solutions business area introduced a next-generation high-sensitivity protein detection platform, SMCxPRO™ technology, which allows scientists to detect and quantify low-abundance biomarkers that traditional methods cannot measure.

Our Process Solutions business area has launched 16 new products since January, including Millipore Express® High Area Filters, providing greater filtration capacity with a smaller footprint than conventional filters—improving economics for biopharmaceutical manufacturing. In addition, the Poloxamer 188 EMPROVE® EXPERT polymer, a surface-active nonionic polymer used in cell culture media as a shear protectant, has become a standard component to cell culture media for production processes.

The Applied Solutions business area unveiled the Milli-Q® IQ 7000 lab water purification system at the Pittcon Conference & Expo 2017. This innovation uses environmentally friendly mercury-free UV lamps and has a smaller ergonomic design to reduce waste, increase productivity in the lab and accelerate research. The launch marked 50 years of providing ultrapure water to scientists in laboratories all over the world.

Life Science continued to make advancements in the area of genome editing with a new technique called proxy-CRISPR. Most natural CRISPR systems found in bacteria cannot work in human cells without significant re-engineering. However, proxy-CRISPR provides a rapid and simple method to increase their usability without the laborious need to re-engineer native CRISPR proteins, thus providing more access to previously unreachable areas of the genome.

Performance Materials

In the first half of 2017, our Performance Materials business sector continued to develop its technologies and products further. We are the market and technology leader in liquid crystals (LCs) and photoresists, which are primarily used in televisions and mobile communication applications. In addition, we are the market leader in pearlescent pigments for the automotive industry and rank among the leading suppliers of OLED materials. Materials for integrated circuits round off the portfolio.

Display Materials

We worked with our customers, namely display manufacturers, on the further development of high-performance liquid crystal technologies. This includes the liquid crystal technology UB-FFS (ultra-brightness fringe-field switching), which continued to show strong growth in the first half of 2017. We are also continuing to test this energy-saving technology for non-mobile applications. The first products using our new liquid crystal technology SA-VA (self-aligned vertical alignment) are expected to come onto the market this year. Like the established liquid crystal technology PS-VA (polymer stabilized vertical alignment), SA-VA is primarily used in high-quality televisions and other large displays (for example, public information displays). This new technology is very eco-friendly and resource-conserving as it requires less energy and solvent in display manufacture. In addition, it is more efficient for display manufacturers because fewer process steps are needed. Since SA-VA technology can be processed at lower temperatures, it is suitable for sensitive materials such as those used in premium products or future applications including flexible displays. To accelerate the development of free-form displays, we are cooperating with FlexEnable of the United Kingdom. This company recently achieved a breakthrough with conformable, large-area, full color and video rate organic LCDs on polymer substrates. With a bend radius that can go below 30 millimeters, organic LCDs can meet entirely new market requirements, for example in automotive applications, where thin, conformable and shapeable displays are needed. It will soon be possible to curve organic LCDs around complex surfaces and shapes when our innovative polymer wall LC technology is used.

Beyond classic displays, we have more strongly positioned liquid crystals under the licrivision™ brand as an innovative material for windows in architectural and automotive applications. We are currently concentrating on three variants: sun protection, glare protection, and privacy control where the windows switch to opaque. After the liquid crystal window technology received extremely positive resonance at trade fairs and in talks with customers, we decided to drive the development forward.

Good progress continues to be made in the development of smart antennas, which are also in demand in the automotive industry and are expected to reach market readiness in 2017. Thanks to a thin functional layer of liquid crystals, the antenna can be electronically pointed to satellites without the need to move the device mechanically.

We have developed a smart automotive headlight system based on an LC display together with Hella, a light and electronics expert, and other partners. With a total of 30,000 pixels, the smart adaptive lighting can be set in a continuously variable manner and in real time to various driving situations. The project, which received funding from the German Federal Ministry of Education and Research (BMBF) was completed in June. Hella is to bring the developed technology to series production.

In order to develop new digital optical applications with liquid crystals, we entered into a five-year research collaboration with the University of Leeds. As one of the United Kingdom's most renowned research institutions for liquid crystal applications, it has recently built a reputation in particular for non-display applications such as switchable contact lenses.

Integrated Circuit Materials

Deposition materials for gas phase depositions are an area with high growth rates for our Integrated Circuit Materials business. As a result of growing requirements in chip production, increasingly more chemical elements are being used in advanced fabrication processes that exploit the possibilities of atomic layer deposition (ALD). New materials are required for the deposition of layers which often are only a few atoms thick, for example, novel precursors that can be applied at lower temperatures and/or selectively to certain parts of a wafer. Such surface selective processes automatically carry the target materials to the right position. This is of high value for our customers since they can eliminate costly photolithography steps and at the same time automatically avoid overlay errors. By strengthening our research activities in cooperation with original equipment manufacturers and chip makers, we are continuously enhancing our position. Our research projects are aimed at discovering new materials for metallization processes with low resistance and various dielectric properties for faster and better processors, servers and data storage density. In order to better support our customers in Asia, we will expand our research capacities in Taiwan by the end of 2017.

Pigments & Functional Materials

In the coating applications sector, we presented first samples of Meoxal® Victoria Red to customers. The Meoxal® brand is characterized by outstanding hiding power and extraordinary brilliance. For the cosmetics area, as part of the Smart Effects initiative, we have developed innovative matte pigments of the Allure series, which combine brightness with hiding power and good skin feel. Ronastar® Flaming Lights, which was launched in the first quarter of 2017, is creating new luster effects. The special design of the aluminum substrate combines a special deep-red color impression with a revolutionary sparkle. In the area of functional materials for technical applications, we further developed the product class of polysilazanes. Owing to their excellent adhesion and barrier properties, these materials are suitable for use in high-quality coating systems, such as to protect against dirt and scratches. For the cosmetics sector, we launched under the brand name RonaCare® RenouMer the first marine active ingredient from a new genetically decoded species of algae. This product firms the skin and supports collagen formation.

Advanced Technologies

Organic light-emitting diodes (OLEDs) are an outstanding example of our R&D activities in the Advanced Technologies business unit. We again forged ahead with their continuous further development in the first half of 2017. On the occasion of the industry exhibition SID Display Week, we reported in May on advances in the development of printing inks. For the first time, our printed red, green and blue layers demonstrated efficiency values comparable to those of vacuum evaporation technology. This will allow flexible or rollable screens to be manufactured in the future, such as for automotive applications or large-area displays. Printed displays achieve greater brightness and better energy efficiency.

We are driving forward material and technology development in the field of hybrid electronics. For instance, at the LOPEC 2017 exhibition in Munich in March, we impressed visitors with the prototype of a flexible display consisting of a backplane with organic thin-film transistors as well as liquid crystals from Merck KGaA, Darmstadt, Germany. In June, we granted the second Displaying Futures Award, worth US$ 150,000. Our objective was to identify flexible applications in the field of hybrid electronics. The winning teams from academia and research institutes focused on future technologies, such as portable devices for health monitoring, soft robotics, electronic sensors and packaging.

In the area of reflective displays for mobile devices, we entered into an agreement with Clearink Displays of the United States in the first quarter of 2017. The aim is to commercialize video-capable reflective color displays based on our materials and on the innovative and patented technology developed by Clearink. At the SID Display Week, Clearink won the prestigious prize for ‘Best in Show’ for this technology. To respond to the growing demand from the industry for our innovative material solutions, we have started investing in our R&D location in Southampton, United Kingdom, to increase our lab capacity.

In the area of electronic packaging, we strengthened our research activities by participating in a consortium led by the Fraunhofer Institute for Reliability and Microintegration in Berlin.

COURSE OF BUSINESS AND ECONOMIC POSITION

Group

Overview – Q2 2017

- Slight increase in Group net sales to € 3.9 billion (Q2 2016: € 3.8 billion)
- Healthcare and Life Science deliver organic sales growth
- Decline in Group EBITDA pre exceptionals by –5.6% to € 1,093 million
- At 28.1%, Group EBITDA margin pre exceptionals does not reach profitability of Q2 2016
- Net financial debt amounts to € 11.2 billion at the end of Q2 2017 (December 31, 2016: € 11.5 billion)

GROUP

Key figures

€ million	**Q2 2017**	Q2 2016	Change	**Jan.–June 2017**	Jan.–June 2016	Change
Net sales	3,891	3,805	2.3%	7,752	7,470	3.8%
Operating result (EBIT)[1]	628	550	14.0%	1,382	1,399	–1.2%
Margin (% of net sales)[1]	16.1%	14.5%		17.8%	18.7%	
EBITDA[1]	1,008	1,069	–5.8%	2,210	2,351	–6.0%
Margin (% of net sales)[1]	25.9%	28.1%		28.5%	31.5%	
EBITDA pre exceptionals[1]	1,093	1,158	–5.6%	2,334	2,242	4.1%
Margin (% of net sales)[1]	28.1%	30.4%		30.1%	30.0%	
Profit after tax	423	314	34.6%	946	907	4.3%
Earnings per share (€)	0.97	0.72	34.7%	2.17	2.08	4.3%
Earnings per share pre exceptionals (€)[1]	1.54	1.55	–0.6%	3.34	3.09	8.1%
Business free cash flow[1]	1,036	799	29.7%	1,796	1,562	15.0%

[1]Not defined by International Financial Reporting Standards (IFRS).

Development of net sales and results of operations

In the second quarter of 2017, net sales of the Group amounted to € 3,891 million (Q2 2016: € 3,805 million). The slight sales increase of € 86 million or 2.3% was due to organic growth generated by the Healthcare and Life Science business sectors. Reported sales reflect slightly positive exchange rate effects (+0.4%) as well as a minor decrease (–0.3%) due to portfolio changes. The Taiwanese dollar, the U.S. dollar and the Brazilian real were responsible for the slightly positive exchange rate effect whereas negative foreign exchange effects resulted from the weaker British pound and Chinese renminbi. With respect to portfolio changes, on the one hand the first-time consolidation of BioControl Systems, Inc., USA, had a positive effect on net sales. On the other hand, the divestment of the entities in Pakistan in December 2016 decreased sales.

With organic sales growth of 2.6%, our Healthcare business sector generated an overall increase in sales to € 1,783 million (Q2 2016: € 1,754 million). Accounting for an unchanged 46% of Group sales, Healthcare was once again the Group's largest business sector in terms of sales. In the second quarter of 2017, Life Science achieved a growth rate of 4.6%, largely thanks to organic sales increases. The business sector's sales increased to € 1,495 million (Q2 2016: € 1,430 million). Consequently, Life Science accounted for 38% of Group sales, as in the year-earlier quarter. Owing to organic sales declines, our Performance Materials business sector reported a slight

GROUP

Net sales components by business sector – Q2 2017

€ million/Change in %	Net sales	Organic growth[1]	Exchange rate effects	Acquisitions/ divestments	Total change
Healthcare	1,783	2.6%	0.1%	–1.0%	1.7%
Life Science	1,495	4.2%	0.1%	0.3%	4.6%
Performance Materials	612	–3.2%	1.8%	–	–1.3%
Group	**3,891**	**2.3%**	**0.4%**	**–0.3%**	**2.3%**

[1]Not defined by International Financial Reporting Standard (IFRS).

decrease in sales to € 612 million (Q2 2016: € 621 million), thus generating 16% of the Group's net sales.

Driven by organic sales growth of 5.3% and supported by slightly positive exchange rate effects, sales in Asia-Pacific rose to € 1,247 million (Q2 2016: € 1,196 million). This positive sales performance was due in particular to our Healthcare business sector, which generated an organic growth rate of 15.8% in this region. The percentage contribution to Group sales by the Asia-Pacific region rose by one percentage point to 32% (Q2 2016: 31%).

In the second quarter of 2017, sales generated in Europe declined slightly by –1.5% to € 1,179 million (Q2 2016: € 1,198 million). This was mainly attributable to organic sales declines in our Healthcare business sector in this region. Consequently, Europe's contribution to Group sales declined in the second quarter of 2017 to 30% (Q2 2016: 31%).

The slight increase in net sales to € 989 million (Q2 2016: € 971 million) in North America was mainly due to our Life Science business sector. At 26%, North America's contribution to Group sales remained unchanged.

Sales in Latin America grew by 7.1% to € 311 million (Q2 2016: € 290 million). Apart from strong organic growth that was mainly generated by Biopharma products from the Healthcare business sector, the region also benefited from slight exchange rate effects. Latin America's share of Group sales amounted to 8% (Q2 2016: 8%).

GROUP

Net sales by region – Q2 2017

€ million/% of net sales

Net sales in the Middle East and Africa region rose in the second quarter of 2017 by 10.2%, amounting to € 165 million (Q2 2016: € 150 million). This positive sales performance was due to Healthcare, the most important business sector for this region. The share of Group sales accounted for by this region amounted to 4%, as in the year-earlier quarter.

GROUP

Net sales components by region – Q2 2017

€ million/Change in %	Net sales	Organic growth[1]	Exchange rate effects	Acquisitions/ divestments	Total change
Europe	1,179	–1.0%	–0.6%	0.1%	–1.5%
North America	989	0.6%	0.8%	0.5%	1.9%
Asia-Pacific (APAC)	1,247	5.3%	0.6%	–1.7%	4.2%
Latin America	311	5.2%	1.6%	0.2%	7.1%
Middle East and Africa (MEA)	165	8.7%	1.4%	–	10.2%
Group	**3,891**	**2.3%**	**0.4%**	**–0.3%**	**2.3%**

[1]Not defined by International Financial Reporting Standards (IFRS).

In the first six months of 2017, Group net sales rose by 3.8% or € 282 million to € 7,752 million € (January-June 2016: € 7,470 million). This increase was due both to organic sales growth (+2.7%) and exchange rate effects (+1.5%). Acquisitions and divestments caused Group net sales to decline by –0.3% in the first half of 2017. The Healthcare and Life Science business sectors respectively contributed +3.5% and +3.7% to the organic increase in Group sales. By contrast, Performance Materials posted an organic sales decline of –2.0%.

Geographically, the Group generated sales increases in all regions apart from Europe. With organic growth of 6.4% in the first half of 2017, Asia-Pacific, the top-selling region, increased

sales by a total of 7.0% to € 2,488 million (January-June 2016: € 2,326 million). In Europe, net sales decreased slightly by –1.4% to € 2,381 million (January-June 2016: € 2,415 million). This was mainly due to the decline in Healthcare sales (–5.2%). In North America, positive exchange rates effects were responsible for a 2.7% increase in sales to € 1,954 million (January-June 2016: € 1,903 million). Both the Latin America and the Middle East and Africa regions generated double-digit growth of 12.6% and 12.1%, respectively. The increase in Latin America to € 626 million (January-June 2016: € 556 million) was due to organic growth (+7.6%) on the one hand and to foreign exchange effects (+4.8%) on the other. In first six months of 2017, the Middle East and Africa region generated net sales of € 302 million (January-June 2016: € 269 million). This increase was mainly attributable to organic growth.

The consolidated income statement of the Group is as follows:

GROUP

Consolidated Income Statement

€ million	**Q2 2017**	Q2 2016	Change	**Jan.–June 2017**	Jan.–June 2016	Change
Net sales	**3,891**	**3,805**	**2.3%**	**7,752**	**7,470**	**3.8%**
Cost of sales	–1,331	–1,315	1.2%	–2,627	–2,622	0.2%
(of which: amortization of intangible assets)[1]	*(–45)*	*(–45)*	*(0.5%)*	*(–91)*	*(–88)*	*(3.6%)*
Gross profit	**2,560**	**2,489**	**2.9%**	**5,125**	**4,848**	**5.7%**
Marketing and selling expenses	–1,217	–1,114	9.3%	–2,385	–2,204	8.2%
(of which: amortization of intangible assets)[1]	*(–258)*	*(–256)*	*(0.7%)*	*(–517)*	*(–513)*	*(0.8%)*
Administration expenses	–257	–209	22.9%	–499	–415	20.3%
Research and development costs	–521	–497	4.9%	–1,016	–986	3.0%
(of which: amortization of intangible assets)[1]	*(–1)*	*(–1)*	*(13.8%)*	*(–2)*	*(–2)*	*(15.9%)*
Other operating expenses and income	63	–119	>100.0%	157	157	0.2%
Operating result (EBIT)[2]	**628**	**550**	**14.0%**	**1,382**	**1,399**	**–1.2%**
Financial result	–71	–121	–41.5%	–142	–190	–25.3%
Profit before income tax	**557**	**429**	**29.7%**	**1,241**	**1,209**	**2.6%**
Income tax	–134	–115	16.4%	–295	–302	–2.5%
Profit after tax	**423**	**314**	**34.6%**	**946**	**907**	**4.3%**
Non-controlling interests	–2	–2	–27.2%	–3	–4	–20.8%
Net income	**421**	**312**	**35.1%**	**943**	**903**	**4.4%**

[1] Excluding amortization of internally generated or separately acquired software.
[2] Not defined by International Financial Reporting Standards (IFRS).

Gross profit of the Group grew in the second quarter of 2017 by € 71 million or 2.9% to € 2,560 million (Q2 2016: € 2,489 million). The resulting gross margin of the Group, i.e. gross profit as a percentage of sales, was 65.8% in the second quarter of 2017 (Q2 2016: 65.4%). The slight improvement in the gross profit and gross margin of the Group was due to the performance of our Life Science business sector.

The increase in Group research and development costs to € 521 million (Q2 2016: € 497 million), which was primarily attributable to our Healthcare business sector, led to a research spending ratio (research and development costs as a percentage of sales) of 13.4% (Q2 2016: 13.1%). Accounting for 75% (Q2 2016: 76%) of Group research and development costs, Healthcare remained the most research-intensive business sector of our company.

Other operating expenses and income (net) showed an income balance of € 63 million in the second quarter of 2017; in the year-earlier quarter this item showed an expense balance of € –119 million. The strong fluctuation was mainly due to developments in our Healthcare business sector (see explanations in the section entitled "Healthcare").

Year-on-year, the operating result (EBIT) of the Group increased by 14.0% to € 628 million (Q2 2016: € 550 million). It should be noted here that the operating result for the second quarter of 2017 also includes expenses for a provision amounting to € 46 million in connection with the company's 350th anniversary in 2018. To mark this anniversary, our employees were promised a one-time payment. These expenses were eliminated during the calculation of EBITDA pre exceptionals (see "Notes to the Consolidated Half-Year Financial Statements").

The negative financial result improved by 41.5% to € –71 million in the second quarter of 2017 (Q2 2016: € –121 million), which was mainly due to the development of the time value of Share Units of Merck KGaA, Darmstadt, Germany, within the scope of the Long-Term Incentive Plan of the Group as well as currency gains from financing activities.

Income tax expenses of € 134 million (Q2 2016: € 115 million) led to an effective tax rate of 24.0% (Q2 2016: 26.7%).

Net income, i.e. profit after tax attributable to shareholders of Merck KGaA, Darmstadt, Germany, rose by € 109 million to € 416 million (Q2 2016: € 312 million), resulting in earnings per share of € 0.97 (Q2 2016: € 0.72).

GROUP

Reconciliation of EBIT[1] to EBITDA pre exceptionals[1]

€ million	**Q2 2017**	Q2 2016	Change	**Jan.–June 2017**	Jan.–June 2016	Change
Operating result (EBIT)[1]	**628**	**550**	**14.0%**	**1,382**	**1,399**	**–1.2%**
Depreciation/amortization/ impairment losses/reversals of impairment losses	380	519	–26.8%	828	952	–13.0%
(of which: exceptionals)	*(–61)*	*(71)*	*(>100.0%)*	*(–57)*	*(71)*	*(>100.0%)*
EBITDA[1]	**1,008**	**1,069**	**–5.8%**	**2,210**	**2,351**	**–6.0%**
Restructuring costs	8	2	>100.0%	12	4	>100.0%
Integration costs/IT costs	31	37	–15.0%	58	64	–10.6%
Gains/losses on the divestment of businesses	–9	–4	>100.0%	–8	–328	–97.6%
Acquisition-related exceptionals	7	53	–86.2%	11	148	–92.7%
Other exceptionals	48	1	>100.0%	51	3	>100.0%
EBITDA pre exceptionals[1]	**1,093**	**1,158**	**–5.6%**	**2,334**	**2,242**	**4.1%**

[1]Not defined by International Financial Reporting Standards (IFRS).

Exceptionals (€ –61 million) included under Depreciation/ amortization/mpairment losses/reversals of impairment losses relate mainly to the reversal of impairment losses on the biopharmaceutical production facility in Corsier-sur-Vevey, Switzerland. The amount recorded in the second quarter of 2016 (€ 71 million) was due to the impairment loss on the co-commercialization right for Xalkori® (please also refer to explanations in the section entitled "Healthcare").

Adjusted for depreciation and exceptionals, EBITDA pre exceptionals, the key financial indicator used to steer operating business, fell by –5.6% to € 1,093 million (Q2 2016: € 1,158 million), resulting in an EBITDA pre exceptionals margin of 28.1% relative to sales (Q2 2016: 30.4%). Earnings per share pre exceptionals (earnings per share adjusted by net of tax effect of exceptionals and amortization of purchased intangible assets) were € 1.54 and thus at the year-earlier level (Q2 2016: € 1.55).

In the first half of 2017, the Group increased EBITDA pre exceptionals by 4.1% to € 2,334 million (January-June 2016: € 2,242 million). Healthcare and Life Science were responsible for the increase. At 30.1%, Group EBITDA margin pre exceptionals was thus on par with the previous year (January-June 2016: 30.0%). Earnings per share pre exceptionals rose by 8.1% to € 3.34 (January-June 2016: € 3.09).

Net assets and financial position

GROUP

Balance sheet structure

	June 30, 2017		Dec. 31, 2016		Change	
	€ million	**in %**	€ million	in %	€ million	in %
Non-current assets	**28,896**	**78.6%**	**30,582**	**79.9%**	**–1,686**	**–5.5%**
of which:						
Intangible assets	23,141		24,989		–1,848	
Property, plant and equipment	4,211		4,230		–19	
Other non-current assets	1,544		1,363		181	
Current assets	**7,878**	**21.4%**	**7,670**	**20.1%**	**208**	**2.7%**
of which:						
Inventories	2,699		2,607		93	
Trade accounts receivable	2,986		2,889		97	
Current financial assets	91		145		–54	
Other current assets	1,060		1,089		–29	
Cash and cash equivalents	1,041		939		102	
Total assets	**36,774**	**100.0%**	**38,251**	**100.0%**	**–1,477**	**–3.9%**
Equity	**13,765**	**37.4%**	**14,050**	**36.7%**	**–285**	**–2.0%**
Non-current liabilities	**14,078**	**38.3%**	**15,115**	**39.5%**	**–1,037**	**–6.9%**
of which:						
Provisions for pensions and other post-employment benefits	2,252		2,313		–61	
Other non-current provisions	788		834		–46	
Non-current financial liabilities	8,152		8,809		–657	
Other non-current liabilities	2,885		3,159		–274	
Current liabilities	**8,931**	**24.3%**	**9,086**	**23.8%**	**–155**	**–1.7%**
of which:						
Current provisions	405		412		–7	
Current financial liabilities	4,228		3,788		440	
Trade accounts payable	1,973		2,048		–75	
Other current liabilities	2,326		2,838		–512	
Total liabilities and equity	**36,774**	**100.0%**	**38,251**	**100.0%**	**–1,477**	**–3.9%**

The total assets of the Group amounted to € 36,774 million as of June 30, 2017. This represents a decline of –3.9% compared with December 31, 2016 (€ 38,251 million). This was mainly attributable to the weaker U.S. dollar, as a consequence of which intangible assets decreased in particular owing to currency translation effects. Working capital rose by 8.3% to € 3,775 million (December 31, 2016: € 3,486 million) owing to an increase in trade accounts receivable and inventories amid a decline in trade accounts payable.

The composition and the development of net financial debt were as follows:

GROUP

Net financial debt[1]

	June 30, 2017	Dec. 31, 2016	Change	
	€ million	€ million	€ million	in %
Bonds and commercial paper	9,055	9,650	–595	–6.2%
Bank loans	2,078	1,978	100	5.0%
Liabilities to related parties	994	758	236	31.2%
Loans from third parties and other financial liabilities	72	80	–8	–10.0%
Liabilities from derivatives (financial transactions)	178	128	50	39.0%
Finance lease liabilities	3	4	–1	–13.1%
Financial liabilities	**12,380**	**12,597**	**–217**	**–1.7%**
less				
Cash and cash equivalents	1,041	939	102	10.9%
Current financial assets	91	145	–54	–37.4%
Net financial debt[1]	**11,248**	**11,513**	**–265**	**–2.3%**

[1]Not defined by International Financial Reporting Standards (IFRS).

GROUP

Reconciliation of net financial debt[1]

€ million	**2017**
January 1	**11,513**
Currency translation difference	–286
Dividend payments to shareholders and to E. Merck KG, Darmstadt, Germany[2]	624
Acquisitions[2]	7
Payments from the divestment of assets held for sale and from other divestments[2]	–11
Free cash flow[1]	–656
Other	57
June 30	**11,248**

[1]Not defined by International Financial Reporting Standards (IFRS).
[2]As reported in the consolidated cash flow statement.

The decrease in equity to € 13,765 million (December 31, 2016: € 14,050 million) was largely due to the development of currency translation differences from the translation of assets held in foreign currencies into euro, the reporting currency, as well as to the dividend payment. The increase in equity was due mainly to profit after tax (see "Consolidated Statement of Changes in Net Equity"). The equity ratio improved to 37.4% (December 31, 2016: 36.7%)

The composition of free cash flow as well as the development of the relevant items are presented in the following table:

GROUP

Free cash flow[1]

€ million	**Q2 2017**	Q2 2016	Change	**Jan.–June 2017**	Jan.–June 2016	Change
Cash flow from operating activities as reported in the consolidated cash flow statement	520	311	67.1%	1,297	663	95.5%
Payments for investments in intangible assets	–81	–33	>100.0%	–289	–45	>100.0%
Payments from the disposal of intangible assets	4	1	>100.0%	4	1	>100.0%
Payments for investments in property, plant and equipment	–172	–125	37.9%	–372	–285	30.7%
Payments from the disposal of property, plant and equipment	–	5	–	17	11	62.0%
Free cash flow[1]	**271**	**159**	**70.3%**	**656**	**345**	**90.0%**

[1]Not defined by International Financial Reporting Standards (IFRS).

In the second quarter of 2017, the business free cash flow of the Group increased by € 238 million to € 1,036 million (Q2 2016: € 799 million). This was achieved despite lower EBITDA pre exceptionals and higher investments since primarily the development of receivables had a positive impact on this key figure.

GROUP

Business free cash flow[1]

€ million	**Q2 2017**	Q2 2016	Change	**Jan.–June 2017**	Jan.–June 2016	Change
EBITDA pre exceptionals[1]	1,093	1,158	–5.6%	2,334	2,242	4.1%
Investments in property, plant and equipment, software as well as advance payments for intangible assets	–195	–150	29.7%	–324	–268	20.6%
Changes in inventories as reported in the consolidated balance sheet	6	–37	>100%	–93	–20	>100.0%
Changes in trade accounts receivable and receivables from royalties and licenses as reported in the consolidated balance sheet	133	–109	>100%	–121	–232	–47.8%
Adjustments first-time consolidation of Sigma-Aldrich	–	–64	–	–	–159	–
Business free cash flow[1]	**1,036**	**799**	**29.7%**	**1,796**	**1,562**	**15.0%**

[1]Not defined by International Financial Reporting Standards (IFRS).

The increase in business free cash flow to € 1,796 million in the first six months of 2017 (January-June 2016: € 1,562 million) was due to higher EBITDA pre exceptionals as well as the development of receivables in comparison with the year-earlier period. Higher investment spending and the development of had a negative effect inventories in the reporting period.

Healthcare

HEALTHCARE

Key figures

€ million	**Q2 2017**	Q2 2016	Change	**Jan.–June 2017**	Jan.–June 2016	Change
Net sales	1,783	1,754	1.7%	3,518	3,400	3.5%
Operating result (EBIT)[1]	348	298	17.0%	794	939	–15.5%
Margin (% of net sales)[1]	19.5%	17.0%		22.6%	27.6%	
EBITDA[1]	465	558	–16.7%	1,095	1,387	–21.1%
Margin (% of net sales)[1]	26.1%	31.8%		31.1%	40.8%	
EBITDA pre exceptionals[1]	480	557	–13.8%	1,113	1,065	4.5%
Margin (% of net sales)[1]	26.9%	31.8%		31.6%	31.3%	
Business free cash flow[1]	467	423	10.3%	823	765	7.6%

[1]Not defined by International Financial Reporting Standards (IFRS).

Development of net sales and results of operations

In the second quarter of 2017, our Healthcare business sector generated organic sales growth of 2.6%. Including an exchange rate effect of 0.1% and a negative portfolio effect of –1.0%, net sales amounted to € 1,783 million (Q2 2016: € 1,754 million). Within the Biopharma business, this development was attributable to medicines from the General Medicine franchise (including CardioMetabolic Care) for the treatment of diabetes (Glucophage®) and cardiovascular disorders (Concor®). By contrast, sales of Rebif® and Erbitux®, our top-selling drugs, declined organically. The divestment of the business in Pakistan at the end of 2016, which primarily had an impact on sales in the General Medicine franchise (including CardioMetabolic Care), led to a portfolio effect of –1.0%. Commission income, which is also included in net sales, dropped by –48.3% to € 22 million (Q2 2016: € 42 million). This was caused in particular by the takeover of the Glucophage® marketing rights in China from Bristol-Myers Squibb at the beginning of 2017. In the past, Healthcare exclusively recorded commission income for Glucophage® sales in China. Since the first quarter of 2017, the business sector no longer reports commission income for this product, but rather the corresponding sales for Glucophage®.

Europe, our Healthcare business sector's top-selling region accounting for 34% of net sales (Q2 2016: 37%), registered an organic sales decline of –5.8%. Consequently, net sales totaled € 610 million (Q2 2016: € 650 million). This was due especially to the difficult competitive environment and further price reductions for the multiple sclerosis treatment Rebif®. The oncology drug Erbitux® as well as the fertility medicine Gonal-f® again saw organic sales declines. The products Concor® and Euthyrox® from our General Medicine franchise (including CardioMetabolic Care) contributed positively to organic growth.

Asia-Pacific, the second-largest region, generated organic sales growth of 15.8%, increasing its overall contribution to sales to 23% (Q2 2016: 21%). This effect was mainly due to the changed business model for Glucophage® marketing in China as of January 1, 2017. Our company's takeover of the Glucophage® marketing rights in China from Bristol-Myers Squibb led to an increase in sales. Previously, only commission income from this business had been reported. Furthermore, Gonal-f® developed favorably and generated double-digit organic growth. A negative portfolio effect of –4.6% was primarily due to the divestment of our business activities in Pakistan. Including currency tailwinds of –0.9%, sales in Asia-Pacific amounted to € 407 million (Q2 2016: € 369 million).

At € 397 million, the North America region delivered net sales on a par with the year-ago quarter (Q2 2016: € 398 million). The organic decline of –1.0% was driven by the –36.3% drop in sales of Gonal-f®, which had benefited from a favorable competitive situation in the year-earlier period. Sales of Rebif® developed positively thanks to price increases and Saizen® also delivered organic growth. Initial sales were also generated with Bavencio®. This immuno-oncology therapy was approved in the United States for the treatment of metastatic Merkel cell carcinoma at the end of March 2017. Including a positive foreign exchange effect of 0.8%, the contribution of North America to sales of the business sector decreased to 22% (Q2 2016: 23 %).

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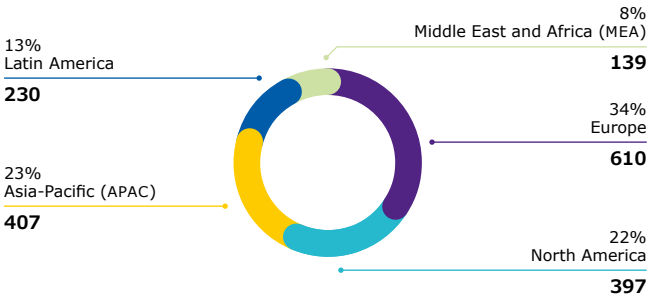
Net sales by region – Q2 2017

€ million / % of net sales of the business sector



Sales in Latin America amounted to € 230 million (Q2 2016: € 214 million). The contribution to net sales rose to 13% (Q2 2016: 12%). Organic growth of 6.2% was mainly attributable to Rebif®, Erbitux® and products from the General Medicine franchise (including CardioMetabolic Care) as well as the Consumer Health business. The foreign exchange effect of 1.5% stemmed mainly from the development of the Brazilian real.

The Middle East and Africa region recorded organic growth of 12.4%. Including positive foreign exchange effects of 0.7%, net sales amounted to € 139 million (Q2 2016: € 123 million). The organic increase was due to the positive organic development of Gonal-f®, Concor® and the Consumer Health business, thus more than offsetting the negative development of Rebif® and Glucophage®.

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Net sales components by region – Q2 2017

€ million / Change in %	Net sales	Organic growth[1]	Exchange rate effects	Acquisitions/ divestments	Total change
Europe	610	–5.8%	–0.4%	–	–6.1%
North America	397	–1.0%	0.8%	–	–0.3%
Asia-Pacific (APAC)	407	15.8%	–0.9%	–4.6%	10.3%
Latin America	230	6.2%	1.5%	–0.1%	7.6%
Middle East and Africa (MEA)	139	12.4%	0.7%	–0.1%	13.0%
Healthcare	**1,783**	**2.6%**	**0.1%**	**–1.0%**	**1.7%**

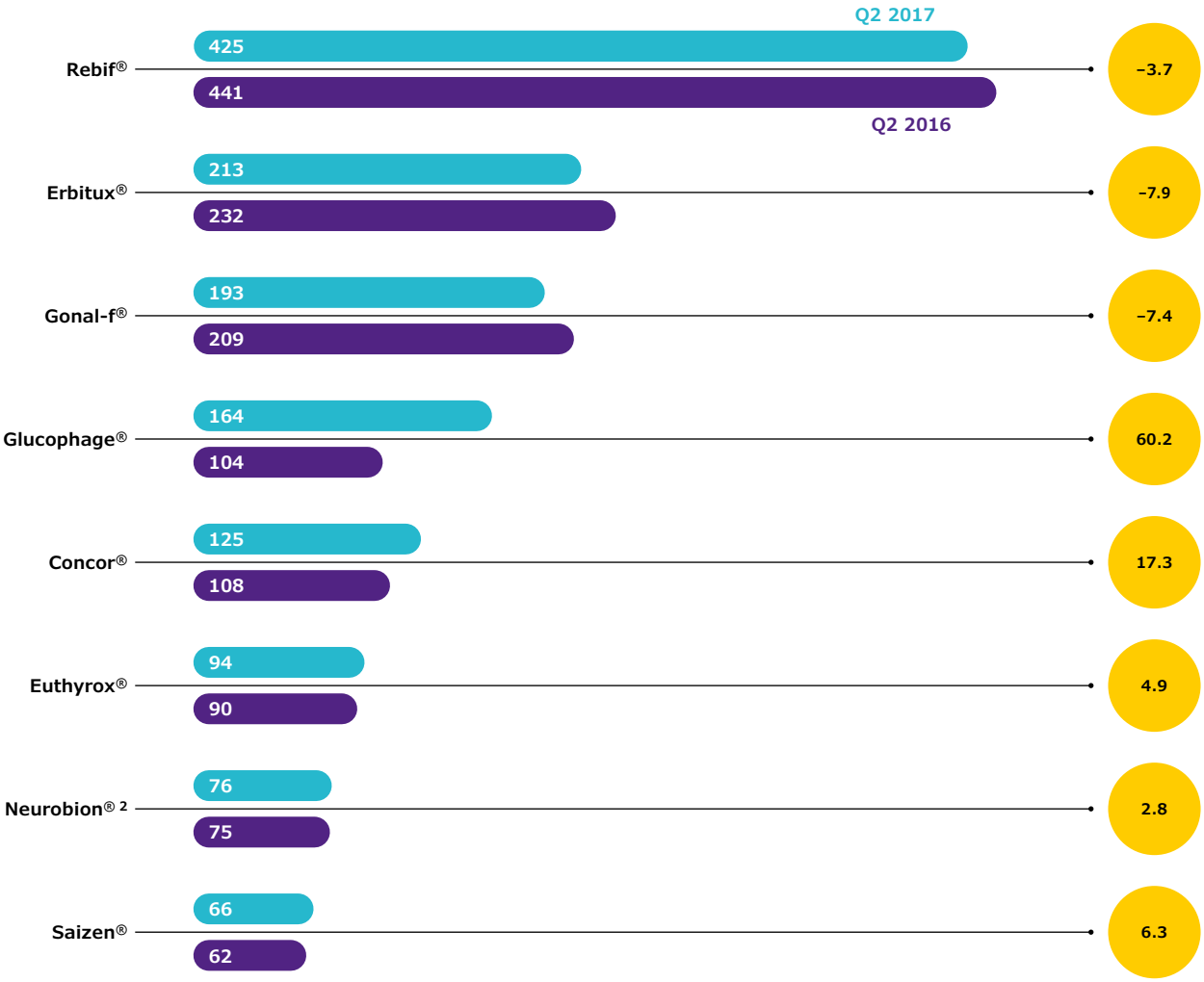
[1]Not defined by International Financial Reporting Standards (IFRS).

Net sales and the organic growth rates of the key products developed as follows:

HEALTHCARE

Product sales and organic growth[1]

€ million / Organic growth in %



[1]Not defined by International Financial Reporting Standard (IFRS).
[2]Including Neurobion®, Dolo-Neurobion®, Dexabion® and Gavindo®.

In the second quarter of 2017, sales of Rebif®, which is used to treat relapsing forms of multiple sclerosis, declined organically by –3.7% owing to the challenging competitive environment, particularly in Europe. Including a negligible foreign exchange impact of 0.1%, sales amounted to € 425 million (Q2 2016: € 441 million). In North America, the largest market for Rebif® accounting for 65% (Q2 2016: 60%) of sales, organic growth amounted to 4.4%. This was mainly due to the price increase at the beginning of 2017 as well as stable volume developments. Including exchange rate effects of 0.9%, sales amounted to € 277 million, thus exceeding the year-earlier quarter (Q2 2016: € 263 million). In Europe, Healthcare's second-largest market accounting for 27% of sales (Q2 2016: 32%), sales also declined organically by –18.7% to € 113 million (Q2 2016: € 141 million). This was due to continued competitive pressure and price reductions. Together, the other regions, namely Latin America, Middle East and Africa, as well as Asia-Pacific generated an 8% share of sales (Q2 2016: 8%).

Owing to an organic sales decline of –7.9% and negative exchange rate effects of –0.1%, the oncology drug Erbitux® generated sales of € 213 million (Q2 2016: € 232 million). Accounting for 53% of sales, (Q2 2016: 54%), Europe remained the top-selling region for Erbitux®. The organic decline of –10.1% stemmed from the persistently difficult competitive environment as well as price reductions. Taking into account exchange rate effects of 0.2%, sales amounted to € 112 million (Q2 2016: € 125 million). The Asia-Pacific region also posted an organic sales decline of –8.9%, which was due to unfavorable price developments that could not be entirely offset by positive sales volumes. Sales in the region amounted to € 65 million (Q2 2016: € 72 million), equating to 30% of total Erbitux® sales (Q2 2016: 31%). In Latin America, the only region that delivered organic growth (16.0%), sales amounted to € 21 million (Q2 2016: € 18 million). The share of sales accounted for by this region thus increased to 10% (Q2 2016: 8%). At € 15 million, sales in the Middle East and Africa region fell short of the year-earlier quarter (Q2 2016: € 17 million), which reflected an organic decrease of –13.6% and exchange rate effects of 1.3%. At 7%, its share of sales remained constant.

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Product sales and organic growth[1] of Rebif® and Erbitux® by region – Q2 2017

		Total	Europe	North America	Asia-Pacific (APAC)	Latin America	Middle East and Africa (MEA)
Rebif®	€ million	425	113	277	3	18	14
	Organic growth[1] in %	–3.7%	–18.7%	4.4%	–8.0%	23.5%	–25.9%
	% of sales	100%	27%	65%	1%	4%	3%
Erbitux®	€ million	213	112	–	65	21	15
	Organic growth[1] in %	–7.9%	–10.1%	–	–8.9%	16.0%	–13.6%
	% of sales	100%	53%	–	30%	10%	7%

[1]Not defined by International Financial Reporting Standards (IFRS).

At € 193 million, second-quarter sales of Gonal-f®, the leading recombinant hormone used in the treatment of infertility, were below the year-earlier level (Q2 2016: € 209 million). The organic sales decline of –7.4 % was primarily attributable to North America and Europe. The strong year-earlier sales in North America were due to a favorable competitive situation. The good organic development in Asia-Pacific as well as in the Middle East and Africa region could only partly compensate for this effect.

In the Endocrinology franchise, which commercializes products to treat growth disorders, sales amounted to € 98 million (Q2 2016: € 96 million), reflecting organic growth of 2.5%. This increase was driven by the growth hormone Saizen®, the top-selling product in the franchise. Including organic growth of 6.3% and foreign exchange effects of –0.6%, sales of this product totaled € 66 million (Q2 2016: € 62 million). This was mainly due to the good market development in North America.

The General Medicine franchise (including CardioMetabolic Care), which commercializes products to treat cardiovascular diseases and diabetes, among other things, generated organic growth of 14.1%. Including a foreign exchange effect of –0.2% and a portfolio effect of –3.3%, net sales totaled € 493 million (Q2 2016: € 446 million). Organic growth was due in particular to the development of Glucophage®, which is used in the treatment of diabetes. Organic growth of 60.2% included the effect of the takeover of the Glucophage® marketing rights in China from Bristol-Myers Squibb. Including exchange rate effects of 0.3% and a portfolio effect of –1.9%, sales of Glucophage® totaled € 164 million (Q2 2016: € 104 million). Concor®, a beta-blocker for the treatment of cardiovascular disorders, continued to develop well, delivering organic sales growth of 17.3% and sales amounting to € 125 million (Q2 2016: € 108 million). The portfolio effect in General Medicine (including CardioMetabolic Care) resulted mainly from the divestment of our business in Pakistan at the end of 2016.

In the second quarter of 2017, the Consumer Health business, which commercializes over-the-counter pharmaceuticals, generated organic sales growth of 4.2%. Including a positive foreign exchange effect of 0.8% and a portfolio effect of –0.8%, net sales amounted to € 221 million (Q2 2016: € 212 million). In particular, the global strategic brands Dolo-Neurobion® and Nasivin® contributed to organic growth across all regions. The portfolio effect resulted from the divestment of our activities in Pakistan.

During the first six months of 2017, net sales of our Healthcare business sector increased by 3.5% to € 3,518 million (January-June 2016: € 3,400 million). This reflected a 3.5% organic increase in sales, positive exchange rate effects of 1.0% and a portfolio effect of –1.0% resulting from the

divestment of the entities in Pakistan. Organic growth was driven in particular by business developments in Asia-Pacific, Latin America as well as the Middle East and Africa region. In Asia-Pacific, organic sales performance includes the effect from the takeover of the Glucophage® marketing rights in China from Bristol-Myers Squibb. Foreign exchange effects resulted mainly from the increase in value of the U.S. dollar and the Brazilian real as well as a negative impact from the decrease in value of the British pound. Rebif®, the top-selling product, generated sales of € 841 million, which was below the year-earlier amount (January-June 2016: € 863 million). Organically, sales decreased by –3.8%. Owing to the tight competitive situation and price declines, the positive development in Latin America could not compensate for the negative developments in the other regions, first and foremost Europe. Organic sales performance in North America was flat compared with the year-earlier period. Including positive exchange rate effects of 1.2%, sales of Rebif® decreased overall by –2.6%. Sales of Erbitux®, the second largest product in terms of sales, totaled € 431 million (January-June 2016: € 438 million). Organically, sales declined by –2.2%, which was due mainly to the continued tight competitive situation and price declines in the European market, which could only be partly compensated for by organic growth in Latin America. Including positive foreign exchange effects of 0.5%, sales decreased by a total of –1.7%. Following strong sales performance in the year-earlier quarter owing to a favorable competitive situation in North America, sales of Gonal-f® decreased organically by –8.4% in the first half of 2017. The decrease in North America could not be offset by the good performance in both Asia-Pacific, with double-digit growth rates in some cases, and the Middle East and Africa. Overall, sales decreased by –7.9% to € 365 million (January-June 2016: € 396 million). At 67.0%, the organic sales growth of Glucophage® was attributable to the changed business model for Glucophage® marketing in China, which generated sales of € 330 million (January-June 2016: € 197 million). Euthyrox®, our medicine for the treatment of thyroid disorders, continued to perform well. Organic growth of 12.6% and foreign exchange effects of 1.7% led to sales of € 183 million (January-June 2016: € 160 million).

In the first half of 2017, sales of the Consumer Health business amounted to € 450 million (January-June 2016: € 427 million). Organic sales growth across all regions totaled 4.6%. This development was driven by of the strategic core brands Neurobion® and Nasivin®.

The results of operations developed as follows:

HEALTHCARE

Results of operations

€ million	Q2 2017	Q2 2016	Change	Jan.–June 2017	Jan.–June 2016	Change
Net sales	**1,783**	**1,754**	**1.7%**	**3,518**	**3,400**	**3.5%**
Cost of sales	–402	–350	15.0%	–773	–660	17.1%
(of which: amortization of intangible assets)[1]	*(–)*	*(–)*	*(–)*	*(–)*	*(–)*	*(–)*
Gross profit	**1,381**	**1,405**	**–1.7%**	**2,745**	**2,740**	**0.2%**
Marketing and selling expenses	–710	–643	10.5%	–1,367	–1,256	8.8%
(of which: amortization of intangible assets)[1]	*(–140)*	*(–143)*	*(–1.9%)*	*(–280)*	*(–286)*	*(–2.0%)*
Administration costs	–78	–66	17.0%	–154	–137	12.5%
Research and development costs	–389	–378	2.9%	–765	–756	1.1%
(of which: amortization of intangible assets)[1]	*(–)*	*(–)*	*(–)*	*(–1)*	*(–1)*	*(0.2%)*
Other operating expenses and income	144	–19	>100.0%	335	348	–3.8%
Operating result (EBIT)[2]	**348**	**298**	**17.0%**	**794**	**939**	**–15.5%**
Depreciation/amortization/impairment losses/reversals of impairment losses	117	261	–55.2%	301	448	–32.9%
(of which: exceptionals)	*(–68)*	*(71)*	*(>100.0%)*	*(–67)*	*(71)*	*(>100.0%)*
EBITDA[2]	**465**	**558**	**–16.7%**	**1,095**	**1,387**	**–21.1%**
Restructuring costs	1	1	11.4%	–	1	–
Integration costs/IT costs	8	4	>100.0%	12	6	89.9%
Gains/losses on the divestment of businesses	–11	–6	91.5%	–11	–329	–96.8%
Acquisition-related exceptionals	–	–	–	–	–	–
Other exceptionals	17	–	–	17	–	–
EBITDA pre exceptionals[2]	**480**	**557**	**–13.8%**	**1,113**	**1,065**	**4.5%**

[1] Excluding amortization of internally generated or separately acquired software.
[2] Not defined by International Financial Reporting Standards (IFRS).

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The gross profit of our Healthcare business sector decreased by –1.7% to € 1,381 million (Q2 2016: € 1,405 million) in the second quarter of 2017. This represented a gross margin of 77.5% (Q2 2016: 80.1%).

The increase in marketing and selling expenses was primarily attributable to higher royalty and license expenses. Among other things, this item included license expenses payable to Bristol-Myers Squibb as of the beginning of 2017 owing to the takeover of the marketing rights to Glucophage® in China. The preparations for the launch of MAVENCLAD™, Bavencio® and medical devices again contributed to the increase in marketing and selling expenses. The fluctuation in other operating expenses and income was attributable to several factors. Other operating income in the second quarter of 2017 was positively impacted by higher license income of around € 20 million for Avonex® as well as the milestone payment of € 36 million recognized as income in May 2017 for the approval of Bavencio® by the U.S. Food and Drug Administration (FDA) in the treatment of bladder cancer. In addition, an impairment loss recorded in 2011 on the biopharmaceutical production facility in Corsier-sur-Vevey, Switzerland, was reversed in the amount of € 69 million (see "Notes to the Consolidated Half-Year Financial Statements"). By contrast, the year-earlier quarter was negatively impacted by the impairment loss on the co-commercialization right for Xalkori® amounting to € 71 million. Both the aforementioned reversal and the impairment loss in the year-earlier quarter were eliminated in the calculation of EBITDA pre exceptionals. The latter amounted to € 480 million (Q2 2016: € 557 million), translating into an EBITDA margin pre exceptionals of 26.9% (Q2 2016: 31.8%).

In the first half of 2017, our Healthcare business sector reported EBITDA pre exceptionals of € 1,113 million (January-June 2016: € 1,065 million). Apart from higher royalty income from Avonex® owing to the patent additionally granted in the United States in June 2016 as well as the milestone payments for Bavencio® recognized as income in March 2017 and May 2017, a contractual agreement at the beginning of the year on a one-time payment for future license payments had a positive impact on earnings. The EBITDA margin pre exceptionals amounted to 31.6% (January-June 2016: 31.3%).

Development of business free cash flow

Business free cash flow of our Healthcare business sector rose in the second quarter of 2017 to € 467 million (Q2 2016: € 423 million). The increase in investments was more than offset by the development of receivables. The reduction in receivables was mainly due to the receipt in May of the payment for the Bavencio® milestone achieved in March 2017 as well as to the receipt of cost reimbursements from Pfizer for expenses in the context of the strategic alliance to co-develop immuno-oncology active ingredients.

HEALTHCARE

Business free cash flow[1]

€ million	**Q2 2017**	Q2 2016	Change	**Jan.–June 2017**	Jan.–June 2016	Change
EBITDA pre exceptionals[1]	480	557	–13.8%	1,113	1,065	4.5%
Investments in property, plant and equipment, software as well as advance payments for intangible assets	–87	–59	46.0%	–131	–101	30.2%
Changes in inventories	1	–26	>100.0%	–24	–64	–63.1%
Changes in trade accounts receivable as well as receivables from royalties and licenses	73	–49	>100.0%	–135	–135	–0.3%
Business free cash flow[1]	**467**	**423**	**10.3%**	**823**	**765**	**7.6%**

[1]Not defined by International Financial Reporting Standards (IFRS).

In the first six months of 2017, business free cash flow increased to € 823 million (January-June 2016: € 765 million). The increase in EBITDA pre exceptionals as well as a positive effect from the change in inventories in comparison with the year earlier period offset higher investments.

Life Science

LIFE SCIENCE

Key figures

€ million	Q2 2017	Q2 2016	Change	Jan.–June 2017	Jan.–June 2016	Change
Net sales	1,495	1,430	4.6%	2,977	2,826	5.3%
Operating result (EBIT)[1]	221	166	33.5%	457	271	68.9%
Margin (% of net sales)[1]	14.8%	11.6%		15.4%	9.6%	
EBITDA[1]	411	343	19.8%	841	627	34.1%
Margin (% of net sales)[1]	27.5%	24.0%		28.2%	22.2%	
EBITDA pre exceptionals[1]	454	417	9.0%	900	810	11.1%
Margin (% of net sales)[1]	30.4%	29.1%		30.2%	28.6%	
Business free cash flow[1]	423	277	52.8%	704	545	29.1%

[1]Not defined by International Financial Reporting Standards (IFRS).

Development of sales and results of operations

In the second quarter of 2017, Life Science reported moderate organic sales growth of 4.2%, an increase of 0.3% from portfolio changes and a foreign exchange impact of +0.1% compared with the year-earlier quarter. Consequently, net sales grew by 4.6% to € 1,495 million (Q2 2016: € 1,430 million) compared with the year-earlier quarter. Acquisition-related growth from the purchase of BioControl Systems Inc. was somewhat offset by the divestment of the business activities in Pakistan. The business sector's organic growth benefited from the positive development of demand across the full portfolio.

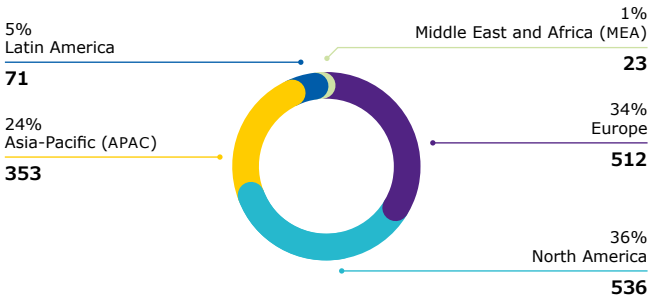
From a regional perspective, North America was the business sector's largest market accounting for 36% (Q2 2016: 36%) of its sales. Organic growth amounted to 2.0%. This was driven by Research Solutions, which reported higher sales in the Lab Separation & Workflow Tools for the pharmaceutical market. Overall, North America sales increased to € 536 million (Q2 2016: € 517 million) in the second quarter of 2017.

Europe, which remained the business sector's second-largest market accounting for 34% (Q2 2016: 34%) of its sales, generated strong organic growth of 5.1%. This growth was primarily driven by Process Solutions, specifically Actives & Formulation as well as Services. Overall, sales in Europe increased to € 512 million (Q2 2016: € 491 million) in the second quarter of 2017.

LIFE SCIENCE

Net sales by region – Q2 2017

€ million/% of net sales of the business sector



Within Asia-Pacific, Life Science reported strong organic growth of 6.8% with all business areas contributing favorably. This growth was mainly driven by sales of biopharma materials and in Filtration & Chromatography within Process Solutions. Overall, sales in Asia-Pacific increased to € 353 million (Q2 2016: € 334 million), representing a contribution of 24% (Q2 2016: 23%) to Life Science's net sales in the second quarter of 2017.

Sales in Latin America grew organically by 5.3% and were mainly driven by Process Solutions, specifically the Upstream &

Systems business. Overall, sales in Latin America increased to € 71 million (Q2 2016: € 65 million).

Sales in Middle East and Africa decreased organically by –5.6% due to Research Solutions and Applied Solutions. This decline was somewhat offset by the performance of Process Solutions. Net sales for the region totaled € 23 million (Q2 2016: € 23 million).

LIFE SCIENCE

Net sales components by region – Q2 2017

€ million/Change in %	Net sales	Organic growth[1]	Exchange rate effects	Acquisitions/ divestments	Total change
Europe	512	5.1%	–1.0%	0.3%	4.4%
North America	536	2.0%	0.7%	1.0%	3.6%
Asia-Pacific (APAC)	353	6.8%	–	–0.8%	5.9%
Latin America	71	5.3%	2.3%	1.3%	8.9%
Middle East and Africa (MEA)	23	–5.6%	5.3%	0.4%	0.1%
Life Science	**1,495**	**4.2%**	**0.1%**	**0.3%**	**4.6%**

[1]Not defined by International Financial Reporting Standards (IFRS).

All three Life Science business areas contributed to the positive organic increase in sales during the second quarter of 2017.

The Process Solutions business area, which markets products and services for the pharmaceutical production value chain, generated very strong organic sales growth of 7.5%. The increase was driven by strong growth across the full portfolio and specifically within the Services business field. Process Solutions thus achieved the highest growth rate within our Life Science business sector. Including the slightly negative impact from the Pakistan divestment (–0.1%), sales amounted to € 570 million in the second quarter of 2017 (Q2 2016[2]: € 531 million). Process Solutions thus accounted for 38% of Life Science's net sales.

The Research Solutions business area recorded a slight organic sales increase of 1.7%. Taking into account positive foreign exchange effects of 0.1% and a slightly negative portfolio effect from the Pakistan divestment (-0.4%), sales amounted to € 526 million (Q2 2016[2]: € 519 million). The share of sales accounted for by Research Solutions in the second quarter of 2017 was 35%.

Applied Solutions, which accounted for a 27% share of Life Science sales, delivered moderate organic sales growth of 3.1% with its broad range of products for researchers and scientific laboratories. Organic growth was mainly driven by the Biomonitoring business field. Including favorable exchange rate effects of 0.1%, and portfolio growth of 1.9%, sales amounted to € 399 million (Q2 2016[2]: € 380 million). Portfolio growth reflects the acquisition of BioControl Systems Inc., a global leader in food safety testing which is expected to provide growth opportunities for Life Science in the food and beverage industry. This favorable portfolio growth was slightly reduced by the impact of the Pakistan divestment.

LIFE SCIENCE

Net sales components by business area – Q2 2017

€ million/Change in %	Net sales	Organic growth[1]	Exchange rate effects	Acquisitions/ divestments	Total change
Process Solutions	570	7.5	–	–0.1	7.3
Research Solutions	526	1.7	0.1	–0.4	1.4
Applied Solutions	399	3.1	0.1	1.9	5.2

[1]Not defined by International Financial Reporting Standards (IFRS).

[2]Previous year's figures have been adjusted due to an internal realignment.

In the first half of 2017, Life Science sales increased to € 2,977 million (January-June 2016: € 2,826 million). Moderate organic growth of 3.7%, a favorable foreign exchange impact of 1.2% and portfolio growth of 0.3% resulted in reported sales growth of 5.3%. All business areas contributed favorably to the organic growth, led by Process Solutions.

Process Solutions generated organic sales growth of 6.2% in the first half of 2017. Including the positive foreign exchange effect of 1.0% and negative impact of the Pakistan divestment of –0.1%, sales amounted to € 1,123 million (January-June 2016[3]: € 1,048 million). Process Solutions thus accounted for 38% of Life Science net sales in the first half of 2017 (January-June 2016: 37%). Overall the Process Solutions portfolio performed well in the first half of 2017, driven by the Upstream & Systems business field with higher demand for biopharma ingredients and single use products. Likewise, the Services business field performed very well.

Research Solutions generated organic growth of 1.3% in the first half of 2017. Taking into account the favorable foreign exchange impact of +1.3% and the negative impact of the Pakistan divestment of –0.4%, sales amounted to € 1,063 million (January-June 2016[3]: € 1,040 million). Research Solutions accounted for 36% of Life Science's net sales (January-June 2016: 37%). All business fields contributed positively to the organic growth with Lab & Specialty Chemicals leading the growth thanks to an increase in raw material demand for cell culture media manufacturing, among other things.

Applied Solutions generated organic growth of 3.7% in the first half of 2017. Taking into account the increase in sales of 2.0% due to the BioControl Systems acquisition and the favorable foreign exchange impact of 1.4%, sales amounted to € 791 million (January-June 2016[3]: € 738 million). In the first half of 2017, Applied Solutions accounted for 26% of Life Science's net sales (January-June 2016: 26%).

The results of operations developed as follows:

LIFE SCIENCE

Results of operations

€ million	**Q2 2017**	Q2 2016	Change	**Jan.–June 2017**	Jan.–June 2016	Change
Net sales	**1,495**	**1,430**	**4.6%**	**2,977**	**2,826**	**5.3%**
Cost of sales	–648	–679	–4.6%	–1,270	–1,392	–8.8%
(of which: amortization of intangible assets)[1]	*(–15)*	*(–15)*	*(0.1%)*	*(–30)*	*(–30)*	*(1.4%)*
Gross profit	**848**	**751**	**12.9%**	**1,707**	**1,434**	**19.0%**
Marketing and selling expenses	–443	–413	7.3%	–891	–833	7.0%
(of which: amortization of intangible assets)[1]	*(–114)*	*(–108)*	*(5.0%)*	*(–230)*	*(–218)*	*(5.4%)*
Administration costs	–65	–58	12.1%	–135	–121	11.9%
Research and development costs	–67	–65	4.3%	–129	–126	2.3%
(of which: amortization of intangible assets)[1]	*(–)*	*(–)*	*(–)*	*(–)*	*(–)*	*(–)*
Other operating expenses and income	–52	–50	3.8%	–94	–83	13.4%
Operating result (EBIT)[2]	**221**	**166**	**33.5%**	**457**	**271**	**68.9%**
Depreciation/amortization/impairment losses/reversals of impairment losses	190	178	7.0%	384	356	7.7%
(of which: exceptionals)	*(3)*	*(–)*	*(–)*	*(3)*	*(–)*	*(–)*
EBITDA[2]	**411**	**343**	**19.8%**	**841**	**627**	**34.1%**
Restructuring costs	1	1	>100.0%	2	1	>100.0%
Integration costs/IT costs	17	21	–19.8%	28	37	–24.3%
Gains/losses on the divestment of businesses	1	–	–	1	–	–
Acquisition-related exceptionals	7	52	–86.0%	11	145	–92.6%
Other exceptionals	17	–	–	18	–	–
EBITDA pre exceptionals[2]	**454**	**417**	**9.0%**	**900**	**810**	**11.1%**

[1] Excluding amortization of internally generated or separately acquired software.
[2] Not defined by International Financial Reporting Standards (IFRS).

[3] Previous year's figures have been adjusted due to an internal realignment.

Gross profit increased by 12.9% to € 848 million owing to sales growth and operational improvements, leading to an improved gross margin of 56.7% (Q2 2016: 52.5%). It should be noted that in the second quarter of 2016, cost of sales included higher expenses in a double-digit million amount owing to the step-up of inventories from the first-time consolidation of Sigma-Aldrich.

The year-on-year increases in marketing and selling expenses were mainly due to higher level of business activity. R&D costs increased by 4.3% over the year-earlier quarter, which among other things was attributable to the acquisition of BioControl Systems Inc.

In comparison with year-earlier period, the operating result (EBIT) of Life Science rose by 33.5% to € 221 million (Q2 2016: € 166 million). EBITDA pre exceptionals, the most important performance indicator, climbed 9.0% to € 454 million (Q2 2016: € 417 million) and thus more strongly than net sales (+4.6% over the year-earlier period). Consequently, the EBITDA margin pre exceptionals improved from 29.1% to 30.4% thanks to the good operating performance and the realization of synergy efficiencies from the Sigma-Aldrich acquisition.

In the first half of 2017, EBITDA pre exceptionals of Life Science rose by 11.1%, to € 900 million, reflecting the organic growth of the business sector and the realization of cost synergies from the Sigma-Aldrich acquisition as planned. The EBITDA margin pre exceptionals increased to 30.2% (January-June 2016: 28.6%).

Development of business free cash flow

In the second quarter of 2017, Life Science generated business free cash flow of € 423 million, representing an increase of 52.8% compared with the year-earlier quarter. This increase was primarily due to the positive development of EBITDA pre exceptionals and trade accounts receivable.

LIFE SCIENCE

Business free cash flow[1]

€ million	**Q2 2017**	Q2 2016	Change	**Jan.–June 2017**	Jan.–June 2016	Change
EBITDA pre exceptionals[1]	454	417	9.0%	900	810	11.1%
Investments in property, plant and equipment, software as well as advance payments for intangible assets	–65	–52	25.0%	–117	–98	19.4%
Changes in inventories	9	–	–	–51	75	>100.0%
Changes in trade accounts receivable as well as receivables from royalties and licenses	25	–25	>100.0%	–27	–85	–67.9%
Adjustments first-time consolidation of Sigma-Aldrich	–	–62	–	–	–156	–
Business free cash flow[1]	**423**	**277**	**52.8%**	**704**	**545**	**29.1%**

[1]Not defined by International Financial Reporting Standards (IFRS).

In the first half of 2017, the business sector's business free cash flow rose by 29.1% to € 704 million (January-June 2016: € 545 million). This increase was driven by higher EBITDA pre exceptionals and the favorable development of trade accounts receivable, which was partially offset by increased inventory levels and higher capital expenditures.

Performance Materials

PERFORMANCE MATERIALS

Key figures

€ million	Q2 2017	Q2 2016	Change	Jan.–June 2017	Jan.–June 2016	Change
Net sales	612	621	–1.3%	1,257	1,243	1.1%
Operating result (EBIT)[1]	167	193	–13.3%	362	399	–9.3%
Margin (% of net sales)[1]	27.3%	31.1%		28.8%	32.1%	
EBITDA[1]	231	267	–13.5%	487	534	–8.8%
Margin (% of net sales)[1]	37.7%	43.0%		38.8%	43.0%	
EBITDA pre exceptionals[1]	239	273	–12.5%	503	547	–8.1%
Margin (% of net sales)[1]	39.1%	44.1%		40.0%	44.0%	
Business free cash flow[1]	239	201	19.4%	472	457	3.3%

[1]Not defined by International Financial Reporting Standards (IFRS).

Development of net sales and results of operations

In the second quarter of 2017, net sales of our Performance Materials business sector decreased slightly by –1.3% to € 612 million (Q2 2016: € 621 million). Organically, sales declined moderately by –3.2% as the Display Materials business remained below the year-earlier quarter. This decline was mitigated by currency tailwinds, which resulted mainly from the strong Taiwanese dollar.

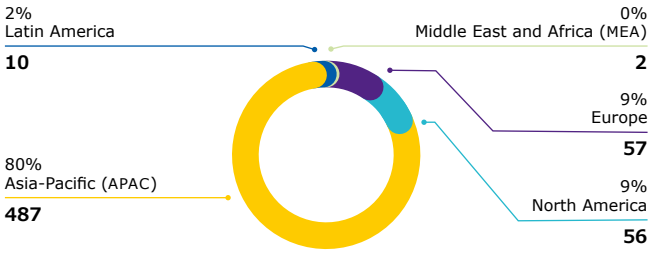
The Display Materials business unit, consisting of the Liquid Crystals business and complementary materials, represented slightly more than 50% of the overall net sales of Performance Materials. This business unit saw an organic decrease in sales, but continued to defend its market leadership position. The decline in sales in the second quarter of 2017 stemmed from the performance of established liquid crystal technologies, which resulted from the continued normalization of the unusually high market shares as well as the price declines customary in this industry. An exception here was our innovative, energy-saving UB-FFS technology, which generated double-digit growth.

The Integrated Circuit Materials (ICM) business unit includes the business with materials used to manufacture integrated circuits. The business unit recorded strong organic sales growth, to which all major businesses contributed. Particularly high growth rates were achieved with dielectric materials and deposition materials for chip production.

PERFORMANCE MATERIALS

Net sales by region – Q2 2017

€ million / % of net sales of the business sector



Net sales of the Pigments & Functional Materials business unit rose slightly in the second quarter of 2017, with the Xirallic® family of pigments continued to generate strong growth.

In the Advanced Technologies business unit, higher demand for OLED materials led to considerable growth rates in net sales.

With an 80% share (Q2 2016: 80%), the Asia-Pacific region once again generated the vast majority of the business sector's net sales. This is due to the concentration of customers for display and integrated circuit materials in Asia. Sales

by the business sector slipped by –1.4% in this region owing to the decline in the Display Materials business unit, which could not be offset by the increase in sales of IC and OLED materials. Overall, however, positive exchange rate effects in the Asia-Pacific region partly compensated for the organic decline.

In Europe, sales were flat in the second quarter of 2017. The slight 1.6% increase in sales in North America was almost exclusively attributable to exchange rate effects.

Since they account for a low proportion of sales, the two regions Latin America and Middle East and Africa played a subordinate role. Latin America recorded an organic decline in sales since the high level of sales generated with insect repellents in the year-earlier quarter normalized.

PERFORMANCE MATERIALS

Net sales components by region – Q2 2017

€ million/Change in %	Net sales	Organic growth[1]	Exchange rate effects	Acquisitions/ divestments	Total change
Europe	57	0.3%	–0.1%	–	0.2%
North America	56	–0.2%	1.7%	–	1.6%
Asia-Pacific (APAC)	487	–3.5%	2.1%	–	–1.4%
Latin America	10	–13.8%	0.5%	–	–13.3%
Middle East and Africa (MEA)	2	–29.9%	1.8%	–	–28.1%
Performance Materials	**612**	**–3.2%**	**1.8%**	**–**	**–1.3%**

[1]Not defined by International Financial Reporting Standards (IFRS).

In the first six months of 2017, sales of the business sector increased slightly by 1.1% to € 1,257 million (January-June 2016: € 1,243 million). This reflects a positive exchange rate effect of 3.2%, which compensated for the –2.0% organic decline in sales in the Display Materials business.

The organic decline in sales in the first half of 2017 stemmed from the performance of established liquid crystal technologies, which resulted from the continued normalization of the unusually high market shares as well as the price declines customary in this industry. An exception here was our innovative, energy-saving UB-FFS technology, which generated double-digit growth.

The Integrated Circuit Materials business unit generated a strong organic growth rate in the first half of 2017. Particularly high growth rates were achieved with dielectric materials and deposition materials for chip production.

The Pigments & Functional Materials business unit generated a moderate increase in sales in the first half of 2017. The growth driver was the business with decorative pigments and particularly sales of the Xirallic® family of pigments, which delivered double-digit growth.

In the Advanced Technologies business unit, higher demand for OLED materials led to considerable growth rates in net sales.

The results of operations developed as follows:

PERFORMANCE MATERIALS

Results of operations

€ million	Q2 2017	Q2 2016	Change	Jan.–June 2017	Jan.–June 2016	Change
Net sales	**612**	**621**	**–1.3%**	**1,257**	**1,243**	**1.1%**
Cost of sales	–284	–287	–1.0%	–583	–569	2.4%
(of which: amortization of intangible assets)[1]	*(–30)*	*(–29)*	*(0.5%)*	*(–61)*	*(–58)*	*(4.6%)*
Gross profit	**328**	**334**	**–1.7%**	**674**	**674**	**0.0%**
Marketing and selling expenses	–64	–59	8.7%	–126	–116	8.1%
(of which: amortization of intangible assets)[1]	*(–4)*	*(–5)*	*(–19.7%)*	*(–7)*	*(–9)*	*(–23.4%)*
Administration costs	–19	–14	29.3%	–36	–31	19.0%
Research and development costs	–59	–53	10.3%	–116	–101	14.9%
(of which: amortization of intangible assets)[1]	*(–1)*	*(–1)*	*(26.3%)*	*(–1)*	*(–1)*	*(31.6%)*
Other operating expenses and income	–20	–15	35.4%	–33	–26	26.5%
Operating result (EBIT)[2]	**167**	**193**	**–13.3%**	**362**	**399**	**–9.3%**
Depreciation/amortization/impairment losses/reversals of impairment losses	64	74	–14.0%	125	135	–7.1%
(of which: exceptionals)	*(7)*	*(–)*	*(–)*	*(7)*	*(–)*	*(–)*
EBITDA[2]	**231**	**267**	**–13.5%**	**487**	**534**	**–8.8%**
Restructuring costs	–	–	–	2	–	–
Integration costs/IT costs	4	6	–35.4%	9	10	–7.9%
Gains/losses on the divestment of businesses	–	–	–	–	–	–
Acquisition-related exceptionals	–	1	–100.0%	–	3	–100.0%
Other exceptionals	5	–	–	5	–	–
EBITDA pre exceptionals[2]	**239**	**273**	**–12.5%**	**503**	**547**	**–8.1%**

[1] Excluding amortization of internally generated or separately acquired software.
[2] Not defined by International Financial Reporting Standards (IFRS).

In the second quarter of 2017 and in line with the slight decline in net sales, the gross profit of our Performance Materials business sector slipped by –1.7% compared with the year-earlier period. At 53.6%, gross margin was at the year-earlier level. The operating result (EBIT) decreased by € 26 million to € 167 million in the second quarter of 2017 (Q2 2016: € 193 million). This was mainly driven by the increase in research and development costs in order to push strategically important initiatives such as liquid crystal windows and OLED forward, as well as higher marketing and selling costs in order to enable future growth. At 39.1%, the EBITDA margin pre exceptionals was lower than the previous year's high level (Q2 2016: 44.1%).

At € 674 million, gross profit for the first half of 2017 was at the previous year's level. At € 362 million, the operating result (EBIT) declined by € 37 million compared with the year-earlier period (January-June 2016: € 399 million). EBITDA pre exceptionals of the business sector decreased by –8.1% to € 503 million (January-June 2016: € 547 million). Consequently, at 40.0% the EBITDA margin pre exceptionals was below the previous year's high level of 44.0%.

Development of business free cash flow

In the second quarter of 2017, business free cash flow of our Performance Materials business sector totaled € 239 million (Q2 2016: € 201 million). The key factors were the development of receivables in the second quarter of both 2017 and 2016, which more than offset lower EBITDA pre exceptionals, which declined over the year-earlier period.

PERFORMANCE MATERIALS

Business free cash flow[1]

€ million	**Q2 2017**	Q2 2016	Change	**Jan.–June 2017**	Jan.–June 2016	Change
EBITDA pre exceptionals[1]	239	273	–12.5%	503	547	–8.1%
Investments in property, plant and equipment, software as well as advance payments for intangible assets	–21	–25	–13.3%	–41	–44	–4.8%
Changes in inventories	–4	–11	–61.5%	–18	–31	–41.9%
Changes in trade accounts receivable as well as receivables from royalties and licenses	26	–36	>100.0%	29	–13	>100.0%
Adjustments first-time consolidation of Sigma-Aldrich	–	–1	–	–	–3	–
Business free cash flow[1]	**239**	**201**	**19.4%**	**472**	**457**	**3.3%**

[1]Not defined by International Financial Reporting Standards (IFRS).

In the first six months of 2017, business free cash flow rose by 3.3% to € 472 million (January-June 2016: € 457 million). This was mainly due to the development of receivables in the first half of both 2017 and 2016.

Corporate and Other

Corporate and Other comprises Group administration expenses for Group functions that cannot be directly allocated to the business sectors, such as Finance, Procurement, Legal, Communications, and Human Resources. Corporate costs additionally encompass expenses for central, non-allocated IT functions, including expenses related to the expansion and harmonization of IT systems within the Group.

CORPORATE AND OTHER

Key figures

€ million	**Q2 2017**	Q2 2016	Change	**Jan.–June 2017**	Jan.–June 2016	Change
Operating result (EBIT)[1]	–109	–105	3.3%	–230	–210	9.9%
EBITDA[1]	–100	–99	0.5%	–212	–197	7.7%
EBITDA pre exceptionals[1]	–80	–89	–9.6%	–182	–180	1.0%
Business free cash flow[1]	–93	–102	–8.8%	–203	–206	–1.1%

[1]Not defined by International Financial Reporting Standard (IFRS).

In the second quarter of 2017, administration expenses reported under Corporate and Other amounted to € 95 million (Q2 2016: € 70 million). Other operating expenses (net) amounted to € –10 million (Q2 2016: € –35 million). Taking the development of these two items into account, in the second quarter of 2017 the operating result (EBIT) amounted to € –109 million (Q2 2016: € –105 million) and EBITDA was € –100 million (Q2 2016: € –99 million). Adjusted for exceptionals, EBITDA pre exceptionals totaled € –80 million (Q2 2016: € –89 million). The improvement in negative EBITDA pre exceptionals also had an impact on the development of business free cash flow, which amounted to € –93 million in the second quarter of 2017 (Q2 2016: –102 million).

In the first half of 2017, EBITDA pre exceptionals of Corporate and Other totaled € –182 million (January-June 2016: € –180 million). Since higher administration expenses were offset by other operating expenses and income, this key figure remained at the previous year's level. Business free cash flow amounted to € –203 million in the reporting period (January-June 2016: € –206 million).

REPORT ON RISKS AND OPPORTUNITIES

As a global company operating a large number of highly innovative business fields, our company is exposed to potential risks and opportunities.

The risk categories presented as well as the opportunities described in the Report on Risks and Opportunities found on pages 127 to 137 of the Annual Report for 2016 remain valid for the Group in the current reporting period.

Within the scope of the antitrust review of the Sigma-Aldrich acquisition, on July 6, 2017, Merck KGaA, Darmstadt, Germany, received notice from the European Commission (EU Commission), in which the EU Commission informed us of its preliminary conclusion that Merck KGaA, Darmstadt, Germany, and Sigma-Aldrich allegedly transmitted incorrect and/or misleading information within the scope of the acquisition of Sigma-Aldrich. The EU Commission received registration of the merger on April 21, 2015 and granted clearance on June 15, 2015 subject to the condition that Merck KGaA, Darmstadt, Germany, and Sigma-Aldrich divest parts of the European solvents and inorganic chemicals businesses of Sigma-Aldrich in order to resolve antitrust concerns. Merck KGaA, Darmstadt, Germany, is reviewing the information provided by the EU Commission and will submit a written response in a timely manner. The ongoing investigations are limited to the examination of violations of EU merger control procedures and do not affect the validity of the EU Commission's decision to approve the merger. The risk is considered likely with an immaterial negative impact on the net assets, financial position and results of operations and is this classified as low. Appropriate accounting measures have been taken.

At present, we are not aware of any risks that could jeopardize the continued existence of Merck KGaA, Darmstadt, Germany. We have a Group-wide risk management system in place to identify, control and mitigate potential risks. We continuously monitor business risks such as issues regarding liquidity, defaults on payables and receivables, currency and interest rates, market pricing, pension obligations, assessment of independent rating agencies, human resources, and information technology.

Regarding legal risks, we monitor a host of potential issues such as litigation regarding product liability, antitrust law, pharmaceutical law, patent law, and environmental protection.

REPORT ON EXPECTED DEVELOPMENTS

With the quarterly statement as of March 31, 2017, we specified our forecast for the development of net sales and EBITDA pre exceptionals for the Group and the individual business sectors in 2017.

Sales performance in the second quarter met our expectations. For the full year, we continue to expect slight to moderate organic net sales growth compared with the previous year. However, owing to the strong increase in the value of the euro against the U.S. dollar and against various emerging market currencies in the second quarter, we now assume that foreign exchange rate effects will be neutral compared with the previous year. To date, we had anticipated a slight positive effect of 1% to 2% on net sales. In contrast to our previous estimate for the full year, we expect a €/US$ exchange rate in the range of 1.09 – 1.13 (formerly: 1.06 – 1.10). Owing to the new exchange rate expectations, we now forecast net sales of € 15.3 billion to € 15.7 billion for the Group in 2017. The sustainability of this development continues to depend also on current political and macroeconomic developments. Consequently, high exchange rate volatility continues to be generally expected for 2017. For 2017, we nevertheless expect that Group EBITDA pre exceptionals will remain in a range of between € 4.4 billion and € 4.6 billion.

For our Healthcare business sector, we continue to expect a slight organic increase in net sales in 2017 in comparison with the previous year. Our assumptions in this regard have not changed since the last forecast: We assume that the positive development of demand in growth markets will contribute significantly to the expected net sales development and will compensate for the expected decline in sales of Rebif® and the continued price pressure in individual regions. In addition, net sales growth will benefit slightly from the full takeover of the marketing rights for the antidiabetic agent Glucophage® in China from Bristol-Myers Squibb Company, USA, at the beginning of 2017. On March 23, 2017, the U.S. Food and Drug Administration (FDA) approved Bavencio® (avelumab) for the treatment of metastatic Merkel cell carcinoma (mMCC). In addition, on May 9, 2017, the FDA approved Bavencio® for the treatment of patients with locally advanced or metastatic urothelial carcinoma (mUC). On June 23, 2017, the Committee for Medicinal Products for Human Use (CHMP) of the European Medicines Agency (EMA) issued a positive opinion regarding the marketing authorization application for cladribine tablets (proposed tradename: MAVENCLAD™ for the treatment of relapsing multiple sclerosis in patients with high disease activity. Moreover, on July 21, 2017, the CHMP recommended the approval of Bavencio® for the treatment of mMCC in Europe. The CHMP recommendations will be reviewed in the coming weeks by the European Commission. For 2017, we continue to expect sales contributions from Bavencio® in the low double-digit euro million range. The divestment of our business in Pakistan in the fourth quarter of 2016 will lead, as expected, to a low portfolio-related decline in sales.

For 2017, we continue to forecast EBITDA pre exceptionals of our Healthcare business sector in a range of between € 1.9 billion and € 2.0 billion. The decline in comparison with the previous year is due on the one hand to the expected increase in research and development spending on our pipeline, which we see in a range from € 150 million to € 200 million. Additionally, we continue to assume that an increase in marketing and selling expenses for the market launch of both Bavencio® and MAVENCLAD™ will lower EBITDA pre exceptionals. Royalty income from a patent granted in the United States in 2016 as well as a one-time payment as compensation for future license payments will increase EBITDA pre exceptionals. Moreover, we include in our forecast the milestone payments from our partner Pfizer for the two aforementioned FDA approvals of Bavencio®. The closing of the transaction announced on April 24, 2017 to divest our Biosimilars business to Fresenius is expected in the second half of 2017, subject to regulatory approvals and other customary closing conditions. The overall cost reduction is therefore likely to be only slight and in the low double-digit million euro range in 2017, depending on the date of the transaction closing.

For our Life Science business sector, our forecast of solid organic sales growth that should be slightly above the expected market growth of approximately 4% p.a. remains unchanged for 2017. This should also reflect initial sales synergies from the acquisition of Sigma-Aldrich. We believe that Process Solutions will contribute the largest share to organic sales growth, even if organic growth in the first half was slightly lower than in previous quarters due to the very high year-earlier basis. Research Solutions and Applied Solutions are also expected to contribute positively to organic sales growth. Additionally, owing to the acquisition of BioControl in 2016 we expect a low positive portfolio effect in 2017. The realization of cost syner-

gies has high priority for us and we will continue to vigorously pursue this aim in 2017 as well. We continue to expect a positive effect of around € 80 million in addition to the cost synergies already realized. Together with organic sales growth of the business sector, EBITDA pre exceptionals should still be between € 1.78 billion and € 1.85 billion.

In the first quarter of 2017, we had already seen signs of normalization of our market shares in the liquid crystals business – from a high base level. This development became increasingly visible in the second quarter of 2017. Consequently, the price pressure customary in this industry could no longer be compensated for by corresponding volume growth. The good organic development that we continue to expect for the Integrated Circuit Materials and Pigments & Functional Materials business units will probably not be able to fully offset the decline in the Display Materials business unit. Overall, for 2017 we assume a slight to moderate organic decline in net sales compared with the previous year. We continue to expect that the ongoing normalization of market shares in our highly profitable Liquid Crystals business will lead to a negative margin mix. Overall, we forecast EBITDA pre exceptionals of between € 0.95 billion and € 1.05 billion for 2017.

We maintain our expectation that EBITDA pre of Corporate and Other in 2017 will amount to between € –350 million and € –400 million. Lower than expected currency hedging losses as a result of current exchange rate developments should lead to a slight improvement within this target corridor. By contrast, we are investing in our IT infrastructure and various digitalization initiatives, which we believe hold promise for new business opportunities and greater efficiency in the future.

GROUP

Forecast for FY 2017

€ million	Net sales	EBITDA pre exceptionals	Business free cash flow
Group	~ 15,300 – 15,700	~4,400 to 4,600	~2,960 to 3,260
Healthcare	• Slight organic growth	~1,900 to 2,000	~1,340 to 1,430
Life Science	• Solid organic sales growth, slightly above the expected market growth of approximately 4% p.a.	~1,780 to 1,850	~1,350 to 1,440
Performance Materials	• Slight to moderate organic decline in sales	~950 to 1,050	~820 to 890
Corporate and Other		~ –350 to –400	~ –500 to –550

Earnings per share pre exceptionals: € 6.15 – € 6.50

Full-year FX assumptions for 2017: € 1 = US$ 1.09 – 1.13
€ 1 = JPY 125
€ 1 = CHF 1.09

SUBSEQUENT EVENTS

On July 12, 2017, we announced that our Life Science business sector plans to further refine its current production site network. In this connection, operations at various sites will be relocated and sequentially closed in the course of 2019 to 2022. Overall, by the year 2022 a total of around 200 positions will be eliminated at the affected sites. The preconditions for the recognition of restructuring provisions and impairment losses on assets had not yet been met on the balance sheet date, namely June 30, 2017.

With respect to the EU Commission antitrust review procedure against the Group regarding the acquisition of Sigma-Aldrich and the related Statement of Objections received by us on July 6, 2017, reference is made to the Report on Risks and Opportunities.

Subsequent to the balance sheet date, no further events of special importance occurred that could have a material impact on the net assets, financial position or results of operations of the Group.

CONSOLIDATED HALF-YEAR FINANCIAL STATEMENTS AS OF JUNE 30, 2017

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Consolidated Income Statement

€ million	Q2 2017	Q2 2016	Jan.–June 2017	Jan.–June 2016
Net sales	**3,891**	**3,805**	**7,752**	**7,470**
Cost of sales	–1,331	–1,315	–2,627	–2,622
(of which: amortization of intangible assets)[1]	*(–45)*	*(–45)*	*(–91)*	*(–88)*
Gross profit	**2,560**	**2,489**	**5,125**	**4,848**
Marketing and selling expenses	–1,217	–1,114	–2,385	–2,204
(of which: amortization of intangible assets)[1]	*(–258)*	*(–256)*	*(–517)*	*(–513)*
Administration expenses	–257	–209	–499	–415
Research and development costs	–521	–497	–1,016	–986
(of which: amortization of intangible assets)[1]	*(–1)*	*(–1)*	*(–2)*	*(–2)*
Other operating income	253	130	523	610
Other operating expenses	–190	–249	–366	–452
Operating result (EBIT)[2]	**628**	**550**	**1,382**	**1,399**
Financial result	–71	–121	–142	–190
Profit before income tax	**557**	**429**	**1,241**	**1,209**
Income tax	–134	–115	–295	–302
Profit after tax	**423**	**314**	**946**	**907**
of which: attributable to shareholders of Merck KGaA, Darmstadt, Germany (net income)	421	312	943	903
of which: attributable to non-controlling interests	2	2	3	4
Earnings per share (€)				
basic	0.97	0.72	2.17	2.08
diluted	0.97	0.72	2.17	2.08

[1] Excluding amortization of internally generated or separately acquired software.
[2] Not defined by International Financial Reporting Standard (IFRS).

Consolidated Statement of Comprehensive Income

€ million	Q2 2017	Q2 2016	Jan.–June 2017	Jan.–June 2016
Profit after tax	**423**	**314**	**946**	**907**
Items of other comprehensive income that will not be reclassified to profit or loss in subsequent periods:				
Remeasurement of the net defined benefit liability				
Changes in remeasurement	91	–211	156	–620
Tax effect	–3	35	–13	99
Changes recognized in equity	89	–176	142	–521
	89	–176	142	–521
Items of other comprehensive income that may be reclassified to profit or loss in subsequent periods:				
Available-for-sale financial assets				
Fair value adjustments	–4	26	2	25
Reclassification to profit or loss	–	–31	–1	–31
Tax effect	–1	1	–	2
Changes recognized in equity	–4	–4	2	–4
Derivative financial instruments				
Fair value adjustments	108	–49	89	10
Reclassification to profit or loss	6	11	27	23
Reclassification to assets	–	–	–	–
Tax effect	–34	12	–36	–8
Changes recognized in equity	80	–27	81	26
Exchange differences on translating foreign operations				
Changes taken directly to equity	–1,123	315	–1,275	–195
Reclassification to profit or loss	–22	3	–22	–74
Changes recognized in equity	–1,145	318	–1,297	–269
	–1,070	288	–1,215	–248
Other comprehensive income	**–981**	**112**	**–1,073**	**–768**
Comprehensive income	**–558**	**427**	**–127**	**139**
of which: attributable to shareholders of Merck KGaA, Darmstadt, Germany	–556	424	–128	136
of which: attributable to non-controlling interests	–2	3	1	3

Consolidated Balance Sheet

€ million	June 30, 2017	Dec. 31, 2016
Non-current assets		
Intangible assets	23,141	24,989
Property, plant and equipment	4,211	4,230
Non-current financial assets	281	218
Other non-current assets	140	131
Deferred tax assets	1,123	1,013
	28,896	**30,582**
Current assets		
Inventories	2,699	2,607
Trade accounts receivable	2,986	2,889
Current financial assets	91	145
Other current assets	583	674
Income tax receivables	413	403
Cash and cash equivalents	1,041	939
Assets held for sale	65	12
	7,878	**7,670**
Total assets	**36,774**	**38,251**
Total equity		
Equity capital	565	565
Reserves	11,291	10,362
Gains / losses recognized in equity	1,850	3,062
Equity attributable to shareholders of Merck KGaA, Darmstadt, Germany	**13,706**	**13,989**
Non-controlling interests	59	61
	13,765	**14,050**
Non-current liabilities		
Provisions for pensions and other post-employment benefits	2,252	2,313
Other non-current provisions	788	834
Non-current financial liabilities	8,152	8,809
Other non-current liabilities	312	439
Deferred tax liabilities	2,574	2,720
	14,078	**15,115**
Current liabilities		
Current provisions	405	412
Current financial liabilities	4,228	3,788
Trade accounts payable	1,973	2,048
Income tax liabilities	1,042	883
Other current liabilities	1,284	1,947
Liabilities directly related to assets held for sale	–	8
	8,931	**9,086**
Total equity and liabilities	**36,774**	**38,251**

Consolidated Cash Flow Statement

€ million	Q2 2017	Q2 2016	Jan.–June 2017	Jan.–June 2016
Profit after tax	**423**	**314**	**946**	**907**
Depreciation/amortization/impairment losses/reversals of impairment losses	380	519	828	952
Changes in inventories	–87	–22	–188	–41
Changes in trade accounts receivable	–6	–50	–211	–208
Changes in trade accounts payable	133	42	71	–48
Changes in provisions	21	–67	72	–46
Changes in other assets and liabilities	–333	–397	–200	–431
Neutralization of gain/loss on disposals of assets	–13	–34	–22	–422
Other non-cash income and expenses	2	6	–	–
Net cash flows from operating activities	**520**	**311**	**1,297**	**663**
thereof: from discontinued operations	**–**	**–**	**–**	**–**
Payments for investments in intangible assets	–81	–33	–289	–45
Payments from the disposal of intangible assets	4	1	4	1
Payments for investments in property, plant and equipment	–172	–125	–372	–285
Payments from the disposal of property, plant and equipment	–	5	17	11
Payments for investments in financial assets	–97	–62	–182	–220
Payments for acquisitions less acquired cash and cash equivalents	–7	–	–7	–
Payments from the disposal of other financial assets	50	79	115	348
Payments from other divestments	–	21	11	21
Payments from the divestment of assets held for sale	–	–	–	340
Net cash flows from investing activities	**–302**	**–114**	**–704**	**170**
thereof: from discontinued operations	**–**	**23**	**–**	**23**
Dividend payments to shareholders of Merck KGaA, Darmstadt, Germany	–155	–136	–155	–136
Dividend payments to non-controlling interests	–2	–	–3	–2
Dividend payments to E. Merck KG, Darmstadt, Germany	–398	–408	–466	–461
Payments from new borrowings of financial liabilities from E. Merck KG, Darmstadt, Germany	349	801	349	801
Repayments of financial liabilities to E. Merck KG, Darmstadt, Germany	–	–480	–109	–498
Repayments of bonds	–	–212	–232	–212
Changes in other current and non-current financial liabilities	22	79	142	–421
Net cash flows from financing activities	**–184**	**–357**	**–474**	**–930**
thereof: from discontinued operations	**–**	**–**	**–**	**–**
Changes in cash and cash equivalents	**34**	**–160**	**118**	**–96**
Changes in cash and cash equivalents due to currency translation	–24	2	–16	–5
Cash and cash equivalents at the beginning of the reporting period	1,031	880	939	832
Changes in cash and cash equivalents due to changes in the scope of consolidation	–	–	–	–8
Cash and cash equivalents as of June 30	**1,041**	**723**	**1,041**	**723**

Consolidated Statement of Changes in Net Equity

	Equity capital			Retained earnings	
€ million	General partner's equity Merck KGaA, Darmstadt, Germany	Subscribed capital Merck KGaA, Darmstadt, Germany	Capital reserves (share premium) Merck KGaA, Darmstadt, Germany	Retained earnings/ Net retained profit	Remeasurement of defined benefit plans
Balance as of January 1, 2016	**397**	**168**	**3,814**	**7,025**	**–1,160**
Profit after tax	–	–	–	903	–
Other comprehensive income	–	–	–	–	–521
Comprehensive income	**–**	**–**	**–**	**903**	**–521**
Dividend payments	–	–	–	–136	–
Transactions with no change of control	–	–	–	–	–
Changes in scope of consolidation/Other	–	–	–	–	–
Balance as of June 30, 2016	**397**	**168**	**3,814**	**7,792**	**–1,681**
Balance as of January 1, 2017	**397**	**168**	**3,814**	**8,049**	**–1,501**
Profit after tax	–	–	–	943	–
Other comprehensive income	–	–	–	–	142
Comprehensive income	**–**	**–**	**–**	**943**	**142**
Dividend payments	–	–	–	–155	–
Transactions with no change of control	–	–	–	–	–
Changes in scope of consolidation/Other	–	–	–	–	–
Balance as of June 30, 2017	**397**	**168**	**3,814**	**8,836**	**–1,358**

Gains/losses recognized in equity					
Available-for-sale financial assets	Derivative financial instruments	Currency translation difference	Equity attributable to shareholders of Merck KGaA, Darmstadt, Germany	Non-controlling interests	Total equity
5	**–176**	**2,714**	**12,787**	**68**	**12,855**
–	–	–	903	4	907
–5	26	–268	–767	–1	–768
–5	**26**	**–268**	**136**	**3**	**139**
–	–	–	–136	–2	–138
–	–	–	–	–	–
–	–	–	–	–	–
–	**–149**	**2,446**	**12,787**	**69**	**12,856**
24	**–191**	**3,229**	**13,989**	**61**	**14,050**
–	–	–	943	3	946
2	81	–1,295	–1,071	–2	–1,073
2	**81**	**–1,295**	**–128**	**1**	**–127**
–	–	–	–155	–3	–158
–	–	–	–	–	–
–	–	–	–	–	–
26	**–110**	**1,934**	**13,706**	**59**	**13,765**

Notes to the Consolidated Half-Year Financial Statements as of June 30, 2017

These consolidated half-year financial statements have been prepared with Merck KGaA, Frankfurter Strasse 250, 64293 Darmstadt, Germany, which manages the operations of the Group, as parent company.

Accounting policies

The half-year financial statements of the Group dated June 30, 2017 comply with IAS 34. They have been prepared in accordance with the International Reporting Standards (IFRS) in force on the balance sheet date and adopted by the European Union as well as in accordance with section 37y in conjunction with section 37w of the German Securities Trading Act (WpHG). In accordance with IAS 34, a condensed scope of reporting as compared with the consolidated financial statements as of December 31, 2016 was selected. The figures presented in this half-year financial report have been rounded, which may lead to individual values not adding up to the totals presented.

The notes to the consolidated financial statements of the Group for 2016, particularly the accounting policies, apply accordingly.

Income tax include the taxes on taxable profit levied in the individual countries plus changes in deferred taxes recognized in income. The income tax in the consolidated half-year financial statements is calculated based on the income of the consolidated companies and the currently valid tax rate as a best possible estimate.

The preparation of the consolidated half-year financial statements requires that assumptions and estimates be made to a certain extent. The assumptions and estimates are based on the current state of knowledge and the data available on the balance sheet date.

No new or amended International Financial Reporting Standards of the International Accounting Standards Board and the IFRS Interpretations Committee (IFRS and IAS, as well as IFRIC and SIC) adopted by the European Union took effect as of fiscal 2017. No rules that will take effect at a later point in time were applied in advance.

The following standards will effect as of fiscal 2018:

- IFRS 9 "Financial Instruments"
- IFRS 15 "Revenue from Contracts with Customers"
- Amendment to IFRS 15 "Revenue from Contracts with Customers"

To prepare for the introduction of IFRS 9, a cross-functional project was launched in 2016. The implementation of the new rules in the systems and processes of the Group companies commenced in 2016 and will be completed in the fourth quarter of 2017.

Within the scope of IFRS 9 implementation, the focus is on the introduction of the

- new classification and categorization rules,
- the new impairment model for trade accounts receivable,
- the categorization and measurement of equity instruments held by the Group as well as
- the new rules on hedge accounting.

According to the present state of knowledge, none of the new rules will have a material impact on the net assets, financial position or results of operations of the Group. The effect on retained earnings as of January 1, 2018 is expected to be less than 1%. The Group will make use of the possibility of modified initial application and record the cumulative adjustment from initial application as of January 1, 2018.

Since the beginning of 2015, a cross-functional project team has been preparing for the process and system implementation of the new IFRS 15 rules on revenue recognition and is using a combination of quantitative and quantitative analyses, questionnaires and contract analyses to do so. The technical implementation of the new rules in the systems and processes of the Group companies commenced in 2016 and will be completed in the course of 2017. The system adaptations relate in particular to the expanded revenue disclosure requirements in the notes to the consolidated financial statements.

Since the Group generates the vast majority of its revenues from simply structured sales of goods at a point in time and only provides longer-term services or conducts complex sales transactions with multiple delivery commitments to a small extent, from today's perspective, the initial application of IFRS 15 is expected to have only immaterial impacts on the net assets, financial position and results of operations. According to the present state of knowledge, the effect on both retained earnings and the net sales of fiscal 2018 is expected to be less than 1%. According to the present state of knowledge, in particular the new rules will have a virtually negligible impact on

- variable considerations,
- the costs of obtaining or fulfilling a contract,
- principal versus agent considerations.

Only minor adjustment effects will probably result from changes in connection with

- the timing of when control of an asset is passed, including consignment agreements
- the accounting treatment of outlicensing contracts for intellectual property
- the accounting treatment of return rights as well as
- the accounting treatment of multiple-element arrangements that include service components.

Relative to the contracts on December 31, 2016, the adjustment effect from changed presentation of multiple-element arrangements that include service components on the date of initial application of IFRS 15 is expected to be less than € 10 million according to the current status of the analysis.

The Group will make use of the possibility of simplified, modified initial application. Accordingly, both satisfied and partially satisfied contracts as of January 1, 2018 will be accounted for as though they had originally been assessed in accordance with the rules of IFRS 15. Prior-year periods will not be adjusted for comparability. The cumulative effect of initial application will be recognized in equity under retained earnings in the opening balance sheet as of January 1, 2018.

Scope of consolidation

As of June 30, 2017, 310 (December 31, 2016: 313) companies were fully consolidated. No companies were consolidated using either the proportionate consolidation method or the equity method as of the balance sheet date. Since the beginning of 2017, five mergers have taken place. Two previously immaterial companies were included in the consolidated financial statements for the first time.

Acquisition of BioControl Systems, Inc., USA, in 2016

Effective December 21, 2016, the Group acquired a 100% interest in BioControl Systems, Inc., Bellevue, USA, (BioControl), a company that develops, manufactures and commercializes materials and systems to check food safety. BioControl is being integrated into the Life Science business sector. The purchase price amounted to US$ 167 million (€ 160 million). As of June 30, 2017, the purchase price allocation is still preliminary in respect of the measurement of intangible assets and deferred tax liabilities.

According to the preliminary purchase price allocation, the acquired assets and liabilities measured at fair values in the balance sheet were as follows:

€ million	Fair values on the acquisition date
Non-current assets	
Intangible assets (excluding goodwill)	56
Property, plant and equipment	2
	59
Current assets	
Cash and cash equivalents	4
Inventories	6
Receivables	5
Other current assets	1
	15
Assets	**74**
Non-current liabilities	
Deferred tax liabilities	4
	4
Current liabilities	
Other current liabilities and provisions	3
	3
Liabilities	**8**
Acquired net assets	**66**
Purchase price for the acquisition of shares	**160**
Positive difference (goodwill)	**94**

The preliminary positive difference of € 94 million was recognized as goodwill. This comprised anticipated synergies from the integration of BioControl into the Group as well as intangible assets that are not recognizable, such as the expertise of the workforce. Synergies are primarily expected in the areas of production, marketing and administration. Goodwill is allocated to the Life Science business sector and is not expected to be deductible for tax purposes.

Costs of € 4 million directly related to the acquisition of the company were incurred almost in full in 2016 and were recorded under other operating expenses.

Within the scope of the acquisition, no contingent consideration was agreed upon which the Group would possibly have to pay in the future. The selling shareholders did not contractually indemnify the Group for the outcome of a contingency or uncertainty related to the acquired assets or liabilities.

The development of goodwill, which is carried in U.S. dollars, during the period from January 1, 2017 and June 30, 2017 was as follows:

€ million	Development of goodwill
Goodwill on January 1, 2017	144
Effects from the adjustment of the purchase price allocation	–51
Exchange rate effects	–7
Goodwill on June 30, 2017	**87**

Licensing agreement with Vertex Pharmaceuticals Inc., USA, for the development and commercialization of research and development programs

On January 11, 2017, the Group announced a licensing agreement with Vertex Pharmaceuticals Inc., Boston, USA, (Vertex). As part of the agreement, the Group has acquired two clinical-stage programs and two additional novel preclinical oncology and immuno-oncology programs. The two clinical-stage programs are pursuing approaches to inhibit the DNA repair pathways that are fundamental to the survival and proliferation of certain cancers. The preclinical programs include one immuno-oncology program against a target with first-in-class potential, and a program against a completely novel target. The Group has full responsibility for the development and commercialization of all programs.

In return, Vertex received an upfront payment of US$ 230 million (€ 218 million) in March 2017 and entitlement to royalty fees on future product sales. The upfront payment was allocated to the acquired programs in the first quarter of 2017 and capitalized accordingly as an intangible asset.

Agreement on compensation for future license payments

On February 6, 2017, the Group entered into a contractual agreement under which the Group is entitled to a one-time payment in exchange for future license payments. In the first quarter of 2017, the Group received a payment from this contractual agreement amounting to € 116 million, which was allocated nearly in full to the Healthcare business sector.

Development agreement with Avillion LLP, United Kingdom, to develop anti-IL-17 A/F Nanobody®

On March 30, 2017, the Group announced an agreement with a subsidiary of Avillion LLP, London, United Kingdom (Avillion), to develop the anti-IL-17 A/F Nanobody® M1095. The Group acquired full, exclusive rights to anti-IL-17 A/F Nanobody® through a global development and commercialization license from Ablynx nv, Ghent, Belgium, in 2013. This Nanobody® is an investigational therapy which has completed Phase I development. As part of the cooperation, Avillion will be responsible for developing anti-IL-17 A/F Nanobody® from Phase II through Phase III in plaque psoriasis. During the development stages, the Group will recognize a financial liability for potential repayment obligations to Avillion.

Divestment of the Biosimilars business

On April 24, 2017, the Group announced an agreement with subsidiaries of Fresenius SE & Co. KGaA on the divestment of the Biosimilars business. The transaction is expected to close in the second half of 2017, subject to regulatory approvals and other customary closing conditions. The parties agreed to enter into supply and services agreements, which include drug development support and manufacturing services.

According to the agreed terms of the transaction, the Group will receive an upfront payment of approximately € 170 million (the amount is dependent upon the closing date), various milestone payments of up to € 500 million, plus royalties on future product sales. Since fiscal 2016, the Biosimilars business, which is part of the Healthcare business sector, has been reported as a disposal group and consists of allocable goodwill, inventories, as well as property, plant and equipment.

Immuno-oncology collaboration with F-star Group, Cambridge, United Kingdom

On June 4, 2017, the Group announced a new strategic collaboration with F-star Delta Ltd, Cambridge, United Kingdom (F-star), for the development and commercialization of bispecific immuno-oncology antibodies. The Group has the option, upon delivery of pre-defined data packages by F-star, to fully acquire the company that owns five bispecific programs, including the preclinical lead asset FS118. In return, the Group made upfront payments to F-star and its shareholders totaling € 60 million, which were largely capitalized in the second quarter of 2017. Moreover, payments to finance R&D and for the achievement of certain milestones as well as in an amount totaling up to € 55 million will be made during the first two years. The milestone payments will be capitalized when they are incurred. R&D financing will be recorded under research and development costs. If the option is exercised and defined milestones are reached, the Group will incur further payment obligations.

Promise of a one-time payment on the occasion of the 350th anniversary of the company in 2018

At an employee assembly meeting on June 27, 2017, the Executive Board of the Group promised employees a one-time payment on the occasion of the company's 350th anniversary in 2018. In the second quarter of 2017, a personnel-related provision amounting to € 46 million was set up for this commitment. The personnel expense was allocated to the business sectors in accordance with the employees benefiting from it.

Reversal of an impairment loss on a biopharmaceutical production facility in Corsier-sur-Vevey, Switzerland

In the second quarter of 2017, an impairment loss was reversed in the amount of € 69 million on the residual book value of a biopharmaceutical production facility in Corsier-sur-Vevey, Switzerland. The impairment loss reversal was recorded under other operating income and allocated to the Healthcare business sector.

The decision to reverse the impairment loss was due to improved expectations for the capacity utilization of the production facility, particularly owing to the recent approvals of the immuno-oncology medicine Bavencio®, which is to be produced in this facility. An impairment loss of € 165 million was originally recognized for the facility in 2011 owing to the overcapacities expected at that time.

Statement of Objections from the European Commission regarding the antitrust review procedure for the Sigma-Aldrich acquisition

On July 6, 2017, the Group received notice from the European Commission (EU Commission), in which the EU Commission informed the Group of its preliminary conclusion that the Group and Sigma-Aldrich allegedly transmitted incorrect and/or misleading information within the scope of the acquisition of Sigma-Aldrich. The EU Commission received registration of the merger on April 21, 2015 and granted clearance on June 15, 2015 subject to the condition that the Group and Sigma-Aldrich divest parts of the European solvents and inorganic chemicals businesses of Sigma-Aldrich in order to resolve antitrust concerns. According to the preliminary viewpoint of the EU Commission communicated in the letter dated July 6, 2017, the Group and Sigma-Aldrich withheld in this connection important information about an innovation project allegedly relevant for certain laboratory chemicals of significance to the analysis by the EU Commission. According to the EU Commission, the innovation project should have been included in the remedies package.

Should the EU Commission conclusively decide that the Group and Sigma-Aldrich provided false or misleading information intentionally or through gross negligence, the Group could face a monetary fine of up to 1% of its global annual Group sales. The Group is reviewing the information provided by the EU Commission and will submit a written response to the EU Commission in a timely manner.

Based on the estimations of the Executive Board a provision in a single-digit million amount was set up in the second quarter of 2017. The expense was recorded under other operating expenses and allocated to the Life Science business sector. The ongoing investigations are limited to the examination of violations of EU merger control procedures and do not affect the validity of the EU Commission's decision to approve the merger.

Segment Reporting

INFORMATION BY BUSINESS SECTOR

€ million	Healthcare				Life Science			
	Q2 2017	Q2 2016	**Jan.–June 2017**	Jan.–June 2016	**Q2 2017**	Q2 2016	**Jan.–June 2017**	Jan.–June 2016
Net sales[1]	**1,783**	**1,754**	**3,518**	**3,400**	**1,495**	**1,430**	**2,977**	**2,826**
Operating result (EBIT)[2]	**348**	**298**	**794**	**939**	**221**	**166**	**457**	**271**
Depreciation and amortization	186	188	368	375	190	178	380	358
Impairment losses	–	73	2	73	–	–	3	–
Reversals of impairment losses	–69	–	–69	–	–	–	–	–1
EBITDA[2]	**465**	**558**	**1,095**	**1,387**	**411**	**343**	**841**	**627**
Exceptionals[2]	15	–1	18	–322	43	74	59	183
EBITDA pre exceptionals (Segment result)[2]	**480**	**557**	**1,113**	**1,065**	**454**	**417**	**900**	**810**
EBITDA margin pre exceptionals (% of net sales)[2]	26.9%	31.8%	31.6%	31.3%	30.4%	29.1%	30.2%	28.6%
Net operating assets[3]			5,921	5,847			20,458	20,995
Segment liabilities[3]			–2,221	–2,327			–835	–819
Investments in property, plant and equipment[4]	80	54	157	129	54	37	126	95
Investments in intangible assets[4]	64	10	258	15	10	16	23	18
Net cash flows from operating activities	326	423	708	681	276	192	568	469
Business free cash flow[2]	467	423	823	765	423	277	704	545

[1] Excluding intersegment sales.
[2] Not defined by International Financial Reporting Standard (IFRS).
[3] Figures for the reporting period ending on June 30, 2017; previous-year figures as of December 31, 2016.
[4] As reported in the consolidated cash flow statement.

Performance Materials				Corporate and Other				Group			
Q2 2017	Q2 2016	**Jan.–June 2017**	Jan.–June 2016	**Q2 2017**	Q2 2016	**Jan.–June 2017**	Jan.–June 2016	**Q2 2017**	Q2 2016	**Jan.–June 2017**	Jan.–June 2016
612	**621**	**1,257**	**1,243**	**–**	**–**	**–**	**–**	**3,891**	**3,805**	**7,752**	**7,470**
167	**193**	**362**	**399**	**–109**	**–105**	**–230**	**–210**	**628**	**550**	**1,382**	**1,399**
57	60	118	121	9	6	18	12	442	432	885	866
7	14	7	14	–	–	–	–	7	87	13	87
–	–	–	–	–	–	–	–	–69	–	–69	–1
231	**267**	**487**	**534**	**–100**	**–99**	**–212**	**–197**	**1,008**	**1,069**	**2,210**	**2,351**
8	7	15	13	19	10	31	17	86	89	123	–109
239	**273**	**503**	**547**	**–80**	**–89**	**–182**	**–180**	**1,093**	**1,158**	**2,334**	**2,242**
39.1%	44.1%	40.0%	44.0%	–	–	–	–	28.1%	30.4%	30.1%	30.0%
		3,772	4,302			335	134			30,484	31,278
		–308	–264			–121	–73			–3,484	–3,482
19	23	47	42	19	10	43	19	172	125	372	285
4	4	5	5	4	4	3	7	81	33	289	45
172	209	551	445	–255	–513	–530	–932	520	311	1,297	663
239	201	472	457	–93	–102	–203	–206	1,036	799	1,796	1,562

Segmentation was performed in accordance with the organizational and reporting structure of the Group valid in 2017.

The fields of activity of the individual segments are described in detail in the sections about the business sectors in the Group interim management report.

Corporate and Other includes income and expenses, assets and liabilities as well as cash flows that cannot be directly allocated to the reportable segments presented. This relates mainly to central Group functions. Moreover, the column serves the reconciliation to the Group numbers. The expenses and income as well as cash flows attributable to the financial result and income taxes are also presented under Corporate and Other.

Apart from sales, the success of a segment is mainly determined by EBITDA pre exceptionals (segment result) and business free cash flow. EBITDA pre exceptionals and business free cash flow are performance indicators not defined by International Financial Reporting Standards. However, they represent important variables used to steer the Group. To permit a better understanding of operational performance, EBITDA pre exceptionals excludes depreciation and amortization, impairment losses, and reversals of impairment losses in addition to exceptional items presented in the following. Among other things, business free cash flow is also used for internal target agreements.

In the first half of 2017, intragroup sales between business sectors were only generated by the Life Science business sector. These resulted from transactions in the amount of € 20 million with the Healthcare business sector and in the amount of € 1 milion with the Performance Materials business sector. Transfer prices for intragroup sales are determined on an arm's length basis.

The following table presents the reconciliation of EBITDA pre exceptionals of all operating businesses to the profit before income tax of the Group:

€ million	**Q2 2017**	Q2 2016	**Jan.–June 2017**	Jan.–June 2016
EBITDA pre exceptionals of the operating businesses[1]	**1,173**	**1,248**	**2,516**	**2,422**
Corporate and Other	–80	–89	–182	–180
EBITDA pre exceptionals of the Group[1]	**1,093**	**1,158**	**2,334**	**2,242**
Depreciation/amortization/impairment losses/reversals of impairment losses	–380	–519	–828	–952
Exceptionals[1]	–86	–89	–123	109
Operating result (EBIT)[1]	**628**	**550**	**1,382**	**1,399**
Financial result	–71	–121	–142	–190
Profit before income tax	**557**	**429**	**1,241**	**1,209**

[1] Not defined by International Financial Reporting Standard (IFRS).

The composition of business free cash flow was as follows:

€ million	**Q2 2017**	Q2 2016	**Jan.–June 2017**	Jan.–June 2016
EBITDA pre exceptionals[1]	**1,093**	**1,158**	**2,334**	**2,242**
Investments in property, plant and equipment, software as well as advance payments for intangible assets	–195	–150	–324	–268
Changes in inventories as reported in the consolidated balance sheet	6	–37	–93	–20
Changes in trade accounts receivable and receivables from royalties and licenses as reported in the consolidated balance sheet	133	–109	–121	–232
Adjustment first-time consolidation of Sigma-Aldrich	–	–64	–	–159
Business free cash flow[1]	**1,036**	**799**	**1,796**	**1,562**

[1] Not defined by International Financial Reporting Standard (IFRS).

Exceptionals were as follows:

€ million	Q2 2017	Q2 2016	Jan.–June 2017	Jan.–June 2016
Restructuring costs	–8	–2	–12	–4
Integration costs/IT costs	–31	–37	–58	–64
Gains (+)/losses (–) on the divestment of businesses	9	4	8	328
Acquisition-related exceptionals	–7	–53	–11	–148
Other exceptionals	–48	–1	–51	–3
Exceptionals before impairment losses/reversals of impairment losses[1]	**–86**	**–89**	**–123**	**109**
Impairment losses	–9	–71	–12	–71
Reversals of impairment losses	69	–	69	–
Exceptionals (total)[1]	**–25**	**–160**	**–66**	**38**

[1] Not defined by International Financial Reporting Standard (IFRS).

The integration and IT costs incurred in the current fiscal year amounting to € 58 million (January-June 2016: € 64 million) resulted mainly from investments in ERP systems as well as from the integration of the Sigma-Aldrich Corporation, USA.

Other exceptionals in the amount of € 51 million (January-June 2016: € 3 million) were mainly attributable to the promise of a one-time payment on the occasion of the 350th anniversary of the company in 2018.

The reconciliation of operating assets presented in the Segment Reporting to the total assets of the Group was as follows:

€ million	June 30, 2017	Dec. 31, 2016
Assets	36,774	38,251
Monetary assets (cash and cash equivalents, current financial assets, loans, and securities)	–1,195	–1,123
Non-operating receivables, income tax receivables, deferred taxes and net defined benefit assets	–1,546	–1,542
Assets held for sale	–65	–12
Operating assets (gross)	**33,969**	**35,575**
Trade accounts payable	–1,973	–2,048
Other operating liabilities	–1,512	–1,729
Segment liabilities	**–3,484**	**–3,777**
Operating assets (net)	**30,484**	**31,798**

Earnings per share

Basic earnings per share are calculated by dividing the profit after tax attributable to the shareholders of Merck KGaA, Darmstadt, Germany, by the weighted average number of theoretical shares outstanding. The calculation of the theoretical number of shares is based on the fact that the general partner's capital is not represented by shares. The share capital of € 168 million was divided into 129,242,252 shares. Accordingly, the general partner's capital of € 397 million was divided into 305,535,626 theoretical shares. Overall, the total capital thus amounted to € 565 million or 434,777,878 theoretical shares outstanding. The weighted average number of shares was likewise 434,777,878 in the first half of 2017.

As of June 30, 2017 there were no potentially dilutive shares. Diluted earnings per share corresponded to basic earnings per share.

Information on the measurement of fair value

On the balance sheet date, assets classified as "available-for-sale" financial assets and derivative financial instruments were measured at fair value.

Derivative financial instruments were used primarily to hedge and reduce the risks of interest rate and foreign exchange positions.

The following table presents the reconciliation of the balance sheets items to the categories of financial instruments pursuant to the disclosures required by IFRS 7 and provides information on the measurement of fair value:

		Subsequent measurement according to IAS 39				
€ million	**Carrying amount June 30, 2017**	Amortized cost	At cost	Fair value	Carrying amount according to IAS 17	Non-financial items
Assets						
Cash and cash equivalents	1,041	1,041	–	–	–	–
Current financial assets	91	42	–	49	–	–
Held for trading (non-derivative)	–	–	–	–	–	–
Derivatives without a hedging relationship	11	–	–	11	–	–
Held to maturity	–	–	–	–	–	–
Loans and receivables	42	42	–	–	–	–
Available for sale	38	–	–	38	–	–
Derivatives with a hedging relationship	–	–	–	–	–	–
Trade accounts receivable	2,986	2,986	–	–	–	–
Loans and receivables	2,986	2,986	–	–	–	–
Other current and non-current assets	722	163	–	42	–	517
Derivatives without a hedging relationship	2	–	–	2	–	–
Loans and receivables	163	163	–	–	–	–
Derivatives with a hedging relationship	40	–	–	40	–	–
Non-financial items	517	–	–	–	–	517
Non-current financial assets	281	11	110	159	–	–
Derivatives without a hedging relationship	10	–	–	10	–	–
Held to maturity	–	–	–	–	–	–
Loans and receivables	11	11	–	–	–	–
Available for sale	259	–	110	149	–	–
Derivatives with a hedging relationship	–	–	–	–	–	–
Liabilities						
Current and non-current financial liabilities	12,380	12,198	–	178	3	–
Derivatives without a hedging relationship	178	–	–	178	–	–
Other liabilities	12,198	12,198	–	–	–	–
Derivatives with a hedging relationship	–	–	–	–	–	–
Finance lease liabilities	3	–	–	–	3	–
Trade accounts payable	1,973	1,973	–	–	–	–
Other liabilities	1,973	1,973	–	–	–	–
Other current and non-current liabilities	1,596	426	–	17	–	1,152
Derivatives without a hedging relationship	3	–	–	3	–	–
Other liabilities	426	426	–	–	–	–
Derivatives with a hedging relationship	14	–	–	14	–	–
Non-financial items	1,152	–	–	–	–	1,152

[1]The exemption provisions under IFRS 7.29a were applied for information on specific fair values.

		Subsequent measurement according to IAS 39					
Fair value June 30, 2017[1]	Carrying amount Dec. 31, 2016	Amortized cost	At cost	Fair value	Carrying amount according to IAS 17	Non-financial items	Fair value Dec. 31, 2016[1]
	939	939	–	–	–	–	
	145	44	–	101	–	–	
–	–	–	–	–	–	–	–
11	59	–	–	59	–	–	59
	–	–	–	–	–	–	
	44	44	–	–	–	–	
38	43	–	–	43	–	–	43
–	–	–	–	–	–	–	–
	2,889	2,889	–	–	–	–	
	2,889	2,889	–	–	–	–	
	805	277	–	12	–	516	
2	1	–	–	1	–	–	1
	277	277	–	–	–	–	
40	11	–	–	11	–	–	11
	516	–	–	–	–	516	
	218	10	59	149	–	–	
10	17	–	–	17	–	–	17
	–	–	–	–	–	–	
	10	10	–	–	–	–	
149	191	–	59	132	–	–	132
–	–	–	–	–	–	–	–
	12,597	12,465	–	128	4	–	
178	128	–	–	128	–	–	128
12,562	12,465	12,465	–	–	–	–	12,802
–	–	–	–	–	–	–	–
	4	–	–	–	4	–	
	2,048	2,048	–	–	–	–	
	2,048	2,048	–	–	–	–	
	2,386	936	–	105	–	1,345	
3	3	–	–	3	–	–	3
–	936	936	–	–	–	–	
14	102	–	–	102	–	–	102
	1,345	–	–	–	–	1,345	

The fair values of financial assets and liabilities were based on the official market prices and market values quoted on the balance sheet date (Level 1 assets and liabilities) as well as mathematical calculation models with inputs observable in the market on the balance sheet date (Level 2 assets and liabilities). Level 1 assets comprised both stocks and bonds and were classified as "available-for-sale", Level 1 liabilities comprised issued bonds and were classified as "other liabilities". Level 2 assets and liabilities were primarily liabilities to banks classified as "other liabilities", as well as derivatives with and without hedging relationships. The fair values of liabilities classified as "other liabilities" were determined by discounting future cash flows using market interest rates. The calculation of the fair value of forward exchange contracts and currency options used market spot and forward rates as well as foreign exchange volatilities applying recognized mathematical principles. The fair value of interest rate swaps was determined with standard market valuation models using interest rate curves available in the market.

Level 3 assets were classified as "available-for-sale". They comprised unlisted equity instruments, an investment in a partnership, conditional purchase price components from the divestment of a shareholding in a corporation, conditional purchase price components from the divestment of business activities in connection with Kuvan®, and equity interests in unlisted funds. The fair values of the unlisted equity instruments were derived from market prices within the scope of equity refinancing sufficiently close to the balance sheet date. The fair value of the interests in the partnership was determined through an internally performed valuation using the discounted cash flow method. Expected future cash flows based on the company's latest medium-term planning were taken into account. Planning related to a period of four years. Cash flows for periods beyond this were included in the scope of calculating the terminal value using a long-term growth rate of 0.5% (December 31, 2016: 0.5%). The discount rate used (after tax) was 7.0% (December 31, 2016: 7.0%). To calculate the fair values of the contingent purchase price components, the expected future milestone payments were weighted using the probability of occurrence and discounted using discount rates (after tax) of 7.6% (December 31, 2016: 7.1%). The fair value of the interests in the funds took into account the fair values of the companies in which the funds had invested.

Level 3 liabilities included contingent purchase price components from the acquisition of a corporation. These were reported as "other liabilities" and amounted to € 1 million as of the balance sheet date.

Counterparty credit risk was taken into consideration for all valuations. In the case of non-derivative financial instruments, such as other liabilities or interest-bearing securities, this was reflected using risk-adequate premiums on the discount rate, while discounts on market value (so-called credit valuation adjustments and debit valuation adjustments) were used for derivatives.

The fair values of available-for-sale investments in equity instruments with a carrying amount of € 110 million (December 31, 2016: € 59 million) could not be reliably determined since there were no quoted prices for identical instruments in an active market and it was not possible to make reliable estimates of fair values. They were measured at cost. Financial investments primarily include equity investments in various companies. There is currently no intention to sell these financial instruments. The Group had no information on a market for these financial instruments.

The financial instruments recognized at fair value in the balance sheet and/or the additionally disclosed fair values for financial instruments were determined as follows:

€ million

June 30, 2017	Assets	Liabilities
Fair value determined by official prices and quoted market values (Level 1)	**64**	**8,569**
thereof: available-for-sale	64	–
thereof: other liabilities	–	8,569
Fair value determined using inputs observable in the market (Level 2)	**64**	**4,188**
thereof: available-for-sale	1	–
thereof: derivatives with a hedging relationship	40	14
thereof: derivatives without a hedging relationship	23	181
thereof: other liabilities	–	3,993
Fair value determined using inputs unobservable in the market (Level 3)	**122**	**1**
thereof: available-for-sale	122	–
thereof: other liabilities	–	1

€ million

December 31, 2016	Assets	Liabilities
Fair value determined by official prices and quoted market values (Level 1)	**54**	**9,058**
thereof: available-for-sale	54	–
thereof: other liabilities	–	9,058
Fair value determined using inputs observable in the market (Level 2)	**134**	**3,978**
thereof: available-for-sale	46	–
thereof: derivatives with a hedging relationship	11	102
thereof: derivatives without a hedging relationship	77	131
thereof: other liabilities	–	3,744
Fair value determined using inputs unobservable in the market (Level 3)	**75**	**1**
thereof: available-for-sale	75	–
thereof: other liabilities	–	1

The changes in financial assets and liabilities allocated to Level 3 and measured at fair value were as follows:

€ million	**2017**	2016
Net book values on Jan. 1, 2017/Jan. 1, 2016	**74**	**11**
Additions due to acquisitions/divestments	–	46
Transfers into Level 3 out of Level 1/Level 2	46	16
Fair value changes		
Gains (+)/losses (–) recognized in consolidated income statement	2	4
Gains (+)/losses (–) recognized in consolidated statement of comprehensive income	–	–3
Währungsumrechnungsdifferenz	–1	–
Disposals due to divestments	–	–
Transfers out of Level 3 into Level 1/Level 2	–	–
Net book value as of June 30, 2017/December 31, 2016	**121**	**74**

The Level 3 reclassifications related mainly to investments in unlisted equity instruments for which equity refinancing at standard market rates took place sufficiently close to the balance sheet date. Gains and losses from Level 3 assets recognized in equity were reported in other comprehensive income in the consolidated statement of comprehensive income under the item "fair value adjustments" related to available-for-sale financial assets. If the discount rate used for the determination of the fair value of the interest in a partnership had been one percentage point higher, other comprehensive income would have decreased by € 2 million. By contrast, a decline in the discount rate by one percentage point would have increased other comprehensive income by € 3 million. An increase or decrease in the discount rate used to calculate the fair values of the contingent purchase price components would not have had a substantial impact on other comprehensive income since the corresponding calculations assume a limited planning horizon and the determination of the fair values does not include a calculation of a terminal value.

Related-party disclosures

As of June 30, 2017, there were liabilities by Merck Financial Services GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany, to E. Merck KG, Darmstadt, Germany, in the amount of € 969.6 million. As of June 30, 2017, Merck KGaA, Darmstadt, Germany, had receivables from E. Merck Beteiligungen KG, Darmstadt, Germany, in the amount of € 4.5 million. Merck & Cie, Switzerland, a subsidiary of Merck KGaA, Darmstadt, Germany, had receivables from E. Merck KG, Darmstadt, Germany, in the amount of € 3.1 million and Merck Financial Services GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany, had receivables from Merck Pensionstreuhandverein e.V., Darmstadt, Germany, amounting to € 0.1 million. The balances resulted mainly from the profit transfers by Merck & Cie, Switzerland, a subsidiary of Merck KGaA, Darmstadt, Germany, to E. Merck KG, Darmstadt, Germany, as well as the reciprocal profit transfers between Merck KGaA, Darmstadt, Germany, and E. Merck KG, Darmstadt, Germany. They included financial liabilities of € 969.6 million, which were subject to standard market interest rates. Neither collateral nor guarantees existed for any of the balances either in favor or to the disadvantage of the Group.

From January to June 2017, Merck KGaA, Darmstadt, Germany, performed services for E. Merck KG, Darmstadt, Germany, and Emanuel-Merck-Vermögens-KG, Darmstadt, Germany, with a value of € 0.5 million and € 0.1 million, respectively. During the same period, E. Merck KG, Darmstadt, Germany, performed services for Merck KGaA, Darmstadt, Germany, with a value of € 0.5 million.

As of June 30, 2017, receivables and payables vis-à-vis non-consolidated subsidiaries amounted to € 14.0 million and € 10.1 million, respectively. From January to June 2017, the Group generated sales of € 0.4 million with these companies. During the same period, expenses amounting to € 1.7 million were incurred as a result of transactions with these companies.

As of June 30, 2017, there were receivables from the Venezuelan entities deconsolidated as of February 29, 2016 with a carrying amount € 22.7 million after impairment losses, and liabilities with a carrying amount of € 21.5 million.

Subsequent Events

On July 12, 2017, the Group announced that the Life Science business sector plans to further refine its current production site network. In this connection, operations at various sites will be relocated and sequentially closed in the course of 2019 to 2022. Overall, by the year 2022 a total of around 200 positions will be eliminated at the affected sites. The preconditions for the recognition of restructuring provisions and impairment losses on assets had not yet been met on the balance sheet date, namely June 30, 2017.

With respect to the EU Commission antitrust review procedure against the Group regarding the acquisition of Sigma-Aldrich and the related Statement of Objections received by the Group on July 6, 2017, reference is made to the section "Statement of Objections from the European Commission regarding antitrust review proceeding for the Sigma-Aldrich acquisition".

Subsequent to the balance sheet date, no further events of special importance occurred that could have a material impact on the net assets, financial position or results of operations of the Group.

Darmstadt, July 28, 2017

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Walter Galinat

Belén Garijo Lopez

Marcus Kuhnert

Responsibility Statement

To the best of our knowledge, and in accordance with the applicable reporting principles for half-year financial reporting, the consolidated half-year financial statements of the Group give a true and fair view of the assets, liabilities, financial position and profit or loss of the Group, and the interim management report of the Group includes a fair review of the development and performance of the business and the position of the Group, together with a description of the material opportunities and risks associated with the expected development of the Group for the remaining months of the financial year.

Darmstadt, July 28, 2017

Stefan Oschmann

Udit Batra

Kai Beckmann

Walter Galinat

Belén Garijo Lopez

Marcus Kuhnert

Review Report

To Merck Kommanditgesellschaft auf Aktien, Darmstadt, Germany:

We have reviewed the condensed half-year consolidated financial statements – comprising the Consolidated Income Statement, the Consolidated Statement of Comprehensive Income, the Consolidated Balance Sheet, the Consolidated Cash Flow Statement, the Consolidated Statement of Changes in Net Equity and Notes to the Half-Year Financial Statements – together with the interim group management report of Merck Kommanditgesellschaft auf Aktien, Darmstadt, Germany, for the period from January 1, 2017 to June 30, 2017 that are part of the half-year financial report according to § 37w WpHG (Wertpapierhandelsgesetz: – German Securities Trading Act). The preparation of the condensed half-year consolidated financial statements in accordance with those IFRS applicable to interim financial reporting as adopted by the EU, and of the interim group management report in accordance with the requirements of the WpHG applicable to interim group management reports, is the responsibility of the Company's management. Our responsibility is to issue a report on the condensed half-year consolidated financial statements and on the interim group management report based on our review.

We performed our review of the condensed half-year consolidated financial statements and the interim group management report in accordance with the German generally accepted standards for the review of financial statements promulgated by the Institut der Wirtschaftsprüfer (IDW). Those standards require that we plan and perform the review so that we can preclude through critical evaluation, with a certain level of assurance, that the condensed half-year consolidated financial statements have not been prepared, in material respects, in accordance with the IFRS applicable to interim financial reporting as adopted by the EU, and that the interim group management report has not been prepared, in material respects, in accordance with the requirements of the WpHG applicable to interim group management reports. A review is limited primarily to inquiries of company employees and analytical assessments and therefore does not provide the assurance attainable in a financial statement audit. Since, in accordance with our engagement, we have not performed a financial statement audit, we cannot issue an auditor's report.

Based on our review, no matters have come to our attention that cause us to presume that the condensed half-year consolidated financial statements have not been prepared, in material respects, in accordance with the IFRS applicable to interim financial reporting as adopted by the EU, or that the interim group management report has not been prepared, in material respects, in accordance with the requirements of the WpHG applicable to interim group management reports.

Frankfurt am Main, July 28, 2017

KPMG AG
Wirtschaftsprüfungsgesellschaft

Original German version signed by

Karl Braun
Wirtschaftsprüfer

Bodo Rackwitz
Wirtschaftsprüfer

Financial Calendar
2017/2018

November
11/9/2017
Report on the third quarter

April
4/27/2018
Annual General Meeting

March
3/8/2018
Annual Report 2017

May
5/15/2018
Report on the first quarter

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