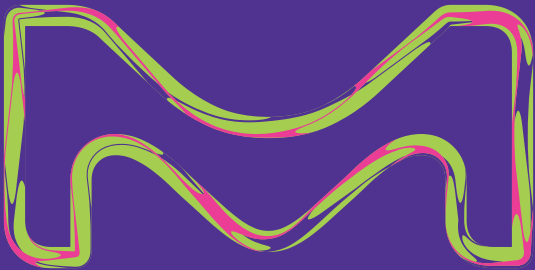




MERCK KGAA, DARMSTADT, GERMANY – BERNSTEIN 13TH ANNUAL STRATEGIC DECISIONS CONFERENCE 2016

Stefan Oschmann, CEO

London, September 21, 2016





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This quarterly presentation contains certain financial indicators such as EBITDA pre exceptionals, 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 Merck KGaA, Darmstadt, Germany 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 quarterly statement have been rounded. This may lead to individual values not adding up to the totals presented.

Agenda

- 01** Business overview & strategy recap
- 02** Healthcare – Funding for success
- 03** Life Science – Focusing on profitable growth
- 04** Performance Materials – Strength and innovation
- 05** Business and financial review H1 2016
- 06** Outlook



01

BUSINESS OVERVIEW & STRATEGY RECAP

Group

Portfolio of three high-tech businesses



Healthcare

Leading in specialty pharma markets

- Biologics and small-molecules
- Research focus: Oncology, Immunology & Immuno-Oncology
- Over-the-counter medicine



Life Science

Leading life science company

- Tools and services for biotech research & production
- Tools and laboratory supply for the academic research and industrial testing



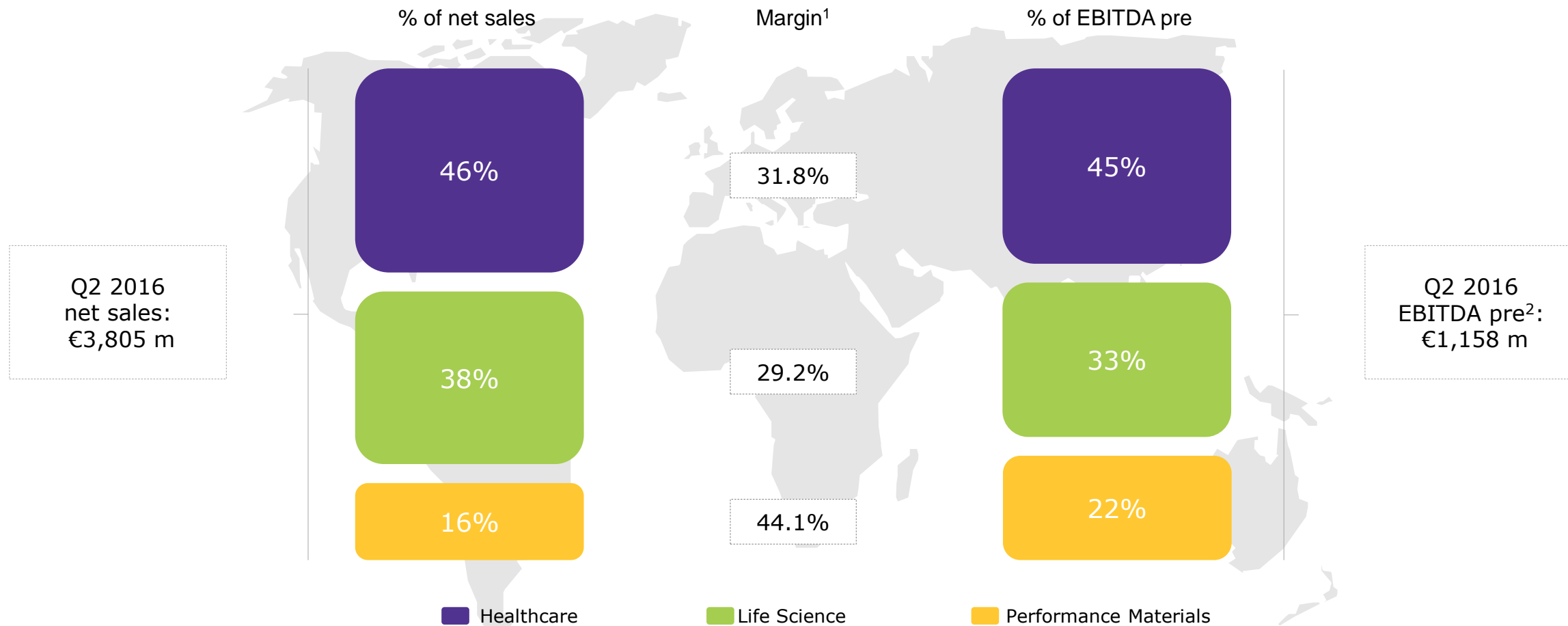
Performance Materials

Market leader in display materials

- Innovative display materials
- Effect pigments and functional materials
- High-tech materials for electronics

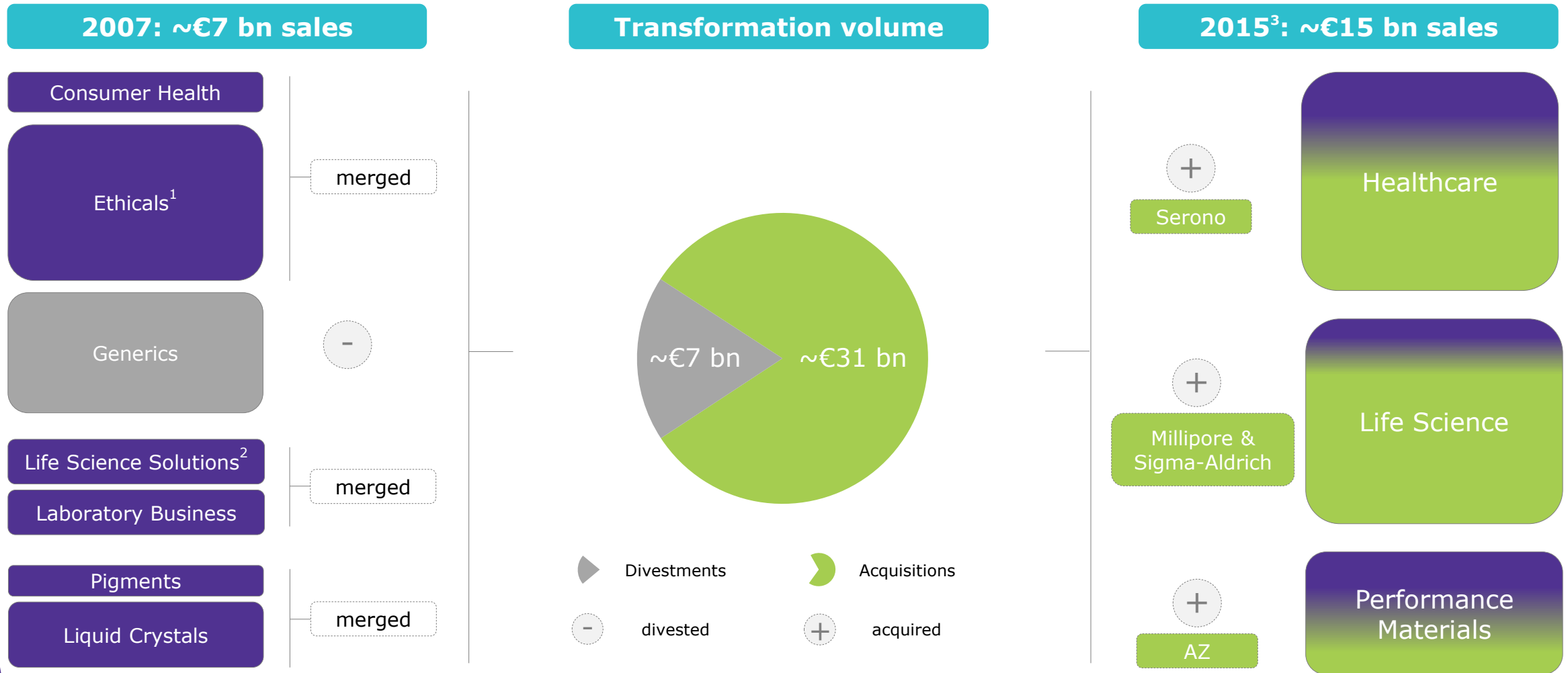
Group

Strong businesses with attractive margins



Group

We have added scale and strengthened the attractiveness of our portfolio



Group

We have created three leading businesses

Healthcare

+ Serono

- Leading biotech company
- Global footprint
- Strong presence in growth markets
- Solid underlying business
- Promising pipeline assets

Life science

+ Millipore
+ Sigma

- No. 2 in the world market
- Broad and global product portfolio
- Leading eCommerce platform
- Best-in-class supply chain management

Performance Materials

+ AZ

- World market leader
- Technology and innovation leader

Science

Technology

Innovation

Specialties

Quality

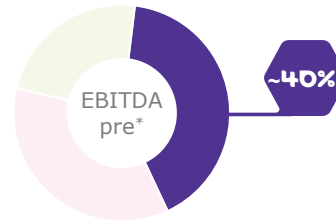
Customer focus

Group

Each business sector has its specific priorities



Healthcare

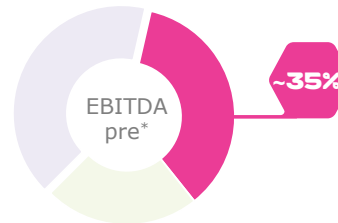


Funding for success

- Invest in pharma pipeline
- Prepare for launches
- Maintain cost discipline



Life Science

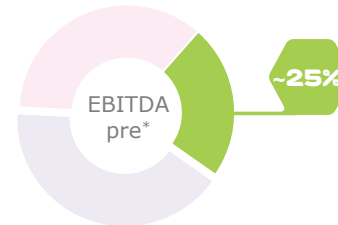


Focusing on profitable growth

- Sustain top-line momentum
- Drive underlying earnings
- Integrate Sigma and realize synergies



Performance Materials



Continue strong differentiation

- Build on resilient four-pillar platform
- Continuously innovate
- Drive profitability with high value-added products

We are set for profitable and sustainable growth

*2015 reported EBITDA pre including Sigma-Aldrich and 100% of expected synergies, excluding Corporate & Other



02

HEALTHCARE – FUNDING FOR SUCCESS

Healthcare

Healthcare is set to deliver on promising pipeline candidates

Deliver
on organic growth

Focus
on pipeline



Stable existing business to fuel slight organic growth



Solid pipeline of oncology, immuno-oncology and immunology molecules



Transformation of R&D operating model ongoing



Competitive R&D funding in our focus areas



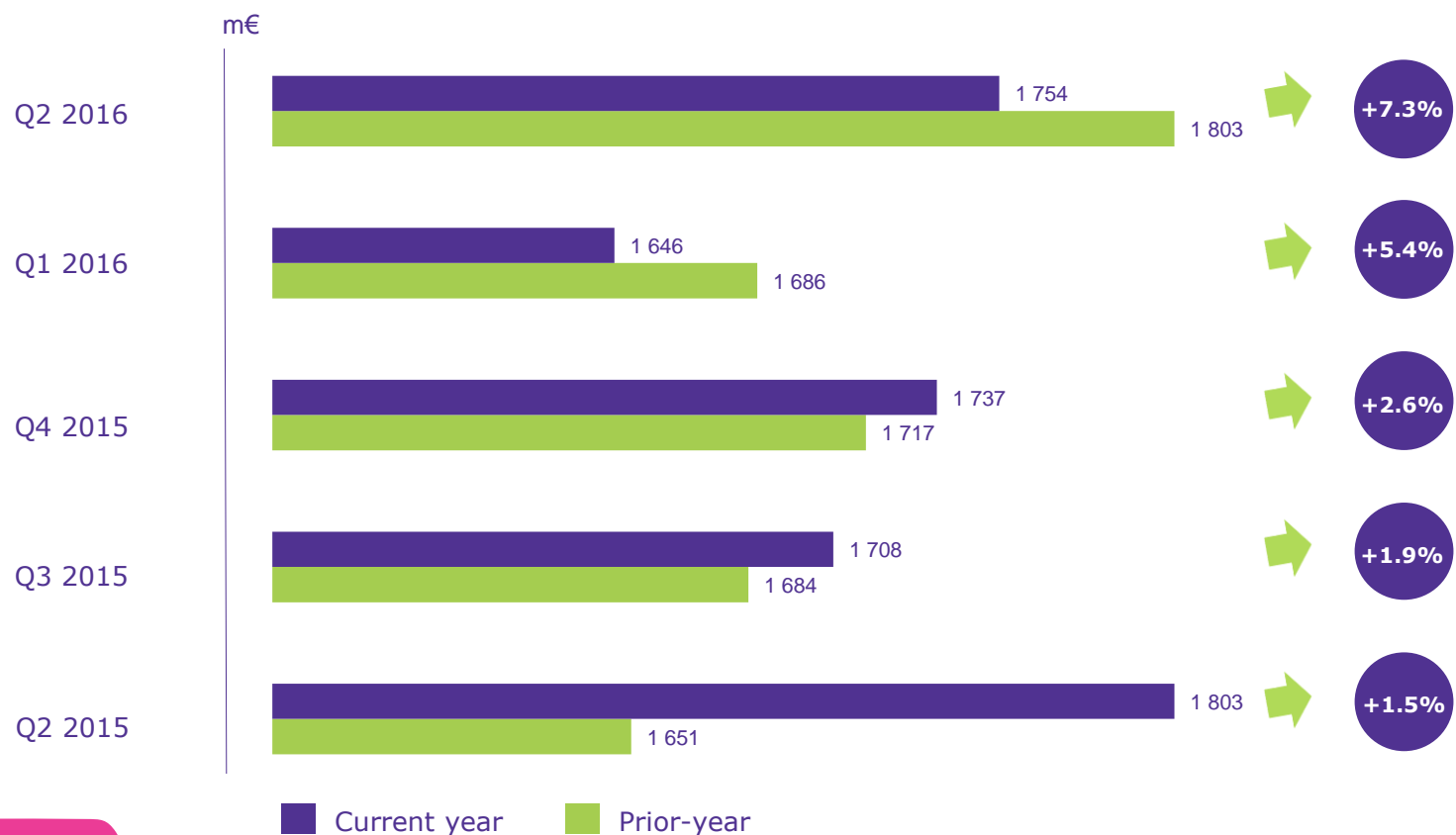
Cost discipline and efficient execution



Healthcare

Delivered organic sales growth, committed to future performance

Stable to slight organic growth



ERBITUX®
CETUXIMAB

Consumer Health

Rebif®

GONAL-f®

Pergoveris™
(hullitropin alfa and lutropin alfa for injection)

VIDREL®

Luveris®

Cetrotide®



Glucophage®

Concor®

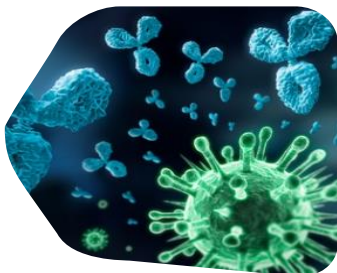
Euthyrox®

Defending the existing product portfolio is a key strength of Healthcare

Healthcare

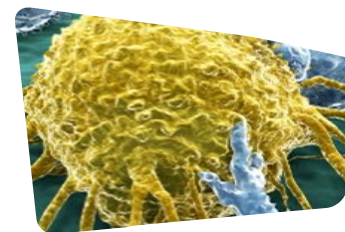
Pipeline highlights

	Immunology	Immuno-Oncology	Oncology
Phase I	<ul style="list-style-type: none"> BTK inhibitor (SLE) 	<ul style="list-style-type: none"> Avelumab (solid tumors) M9241 (NHS-IL12) M7824 (bifunctional immunotherapy) 	<ul style="list-style-type: none"> Tepotinib (solid tumors) DNA-PK inhibitor (solid tumors)
Phase II	<ul style="list-style-type: none"> Atacicept (SLE) BTK (RA) 	<ul style="list-style-type: none"> Avelumab (mMCC) 	<ul style="list-style-type: none"> Tepotinib (HCC, NSCLC)
Phase III	<ul style="list-style-type: none"> MSB11022 (proposed biosimilar of Adalimumab) 	<ul style="list-style-type: none"> Avelumab (Bladder, Gastric 1L&3L, NSCLC 1L&2L, Ovarian 1L&plat res./ref., Renal Cell) 	
Registration	<ul style="list-style-type: none"> Cladribine tablets (MS)¹ 		



selected R&D projects

- Atacicept:** phase III decision expected in H2 2016
- BTK inhibitor:** three phase II trials to be started in 2016 (e.g. RA and SLE) – RA already started
- Cladribine tablets:** EMA accepted submission for review of market authorization approval in July 2016
- M7824 (bifunctional PD-L1 + TGFbeta trap):** novel, first in-class bifunctional immunotherapy, expansion into phase Ib cohorts started
- Tepotinib:** analysis of phase II data for HCC and NSCLC expected in H1 2018



avelumab

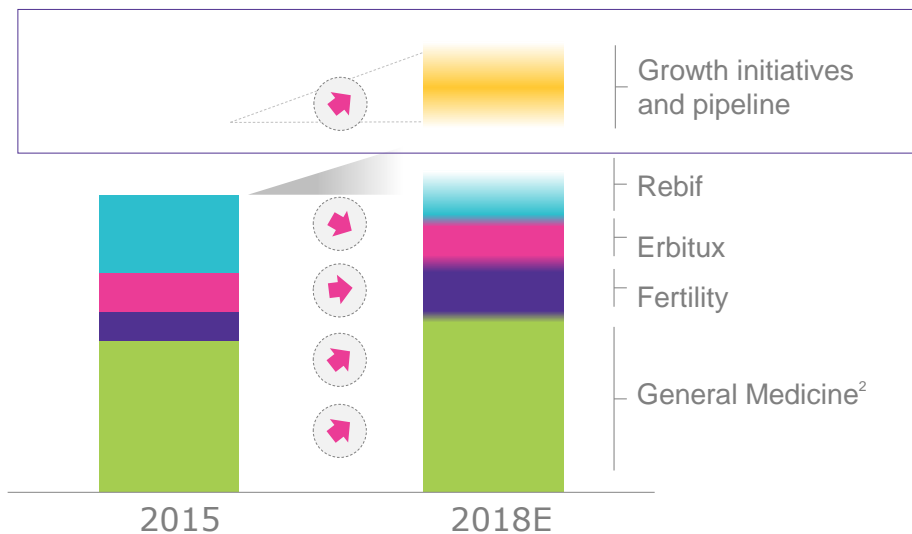
- Cooperation with Pfizer
- Currently eight phase III trials ongoing
- MCC 2L: encouraging response rates presented at ASCO 2016 – application for market authorization by FDA planned in H2 2016
- Overall, around 30 ongoing therapy programs, spanning approximately 2,200 patients across more than 15 tumor types

(1) As announced on July 18th, 2016 the European Medicines Agency (EMA) accepted Merck's KGaA, Darmstadt, Germany Marketing Authorization Application
 Abbreviations: HCC: hepatocellular cancer | mMCC: metastatic merkel cell carcinoma | NSCLC: non-small cell lung cancer | RA: rheumatoid arthritis | SLE: systematic lupus erythematosus | MS: multiple sclerosis | plat res./ref.: platinum resistant/refractory | 1L: 1st line treatment | 2L: 2nd line treatment | 3L: 3rd line treatment

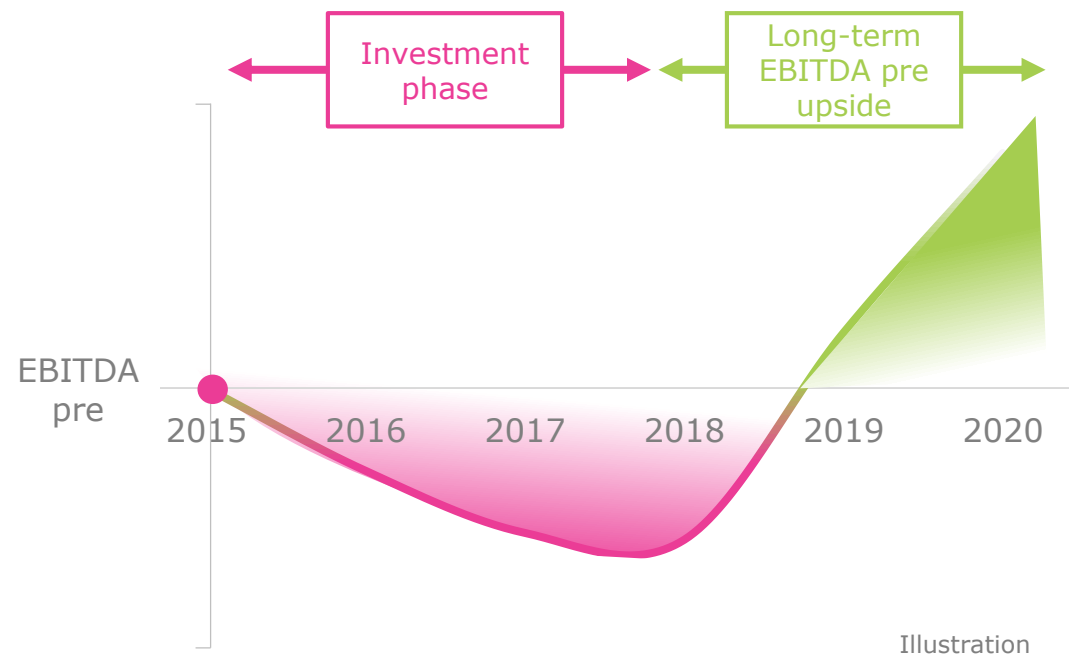
Healthcare

Pipeline opportunities will lead to rising investments

Stable to slightly growing¹ sales until 2018 confirmed



Should pipeline catalysts materialize, investments will lead to considerable payback as of 2019+



Rising investments until 2018 to accelerate sales and earnings growth as of 2019

¹ Organic; ² including Consumer Health, Cardiometabolic Care, Endocrinology, General Medicine and Others



03

**LIFE SCIENCE –
FOCUSING ON
PROFITABLE GROWTH**

Life Science

Serving customers across the life science industry

RESEARCH



- Academic and government institutions
- Biopharma R&D
- Industry R&D

PROCESS



- Pharmaceutical companies
- Small biotech
- Contract manufacturing organizations

APPLIED



- Diagnostic manufacturers
- Clinical testing labs
- Food & Beverage manufacturers

Life Science

We create sustainable value that is based on strong strategic levers



Wide, innovative portfolio

- A combined portfolio of +300,000 products
- Integrated offerings along the life science value chain
- Complete workflow solutions



Balanced Geographic Footprint

- Increased presence in North America
- Accelerating growth momentum in Asia
- Expanded geographic reach in 60+ countries



Industry-leading Capabilities

- Outstanding supply chain management (Ability to deal with complexity)
- Simple e-commerce platform (customer interface with global coverage)
- Expertise to manage regulatory barriers

Our capabilities are the foundation for future topline growth in Life Science

Life Science delivers synergies and integrates as planned

synergies

On track to deliver 2016 synergy target of €90 m:

- HQ measures complete
- 50% of headcount targets met
- 4 site closures in progress
- Procurement actions moving
- Preparing distribution consolidation



integration

Smooth integration ongoing with early achievements:

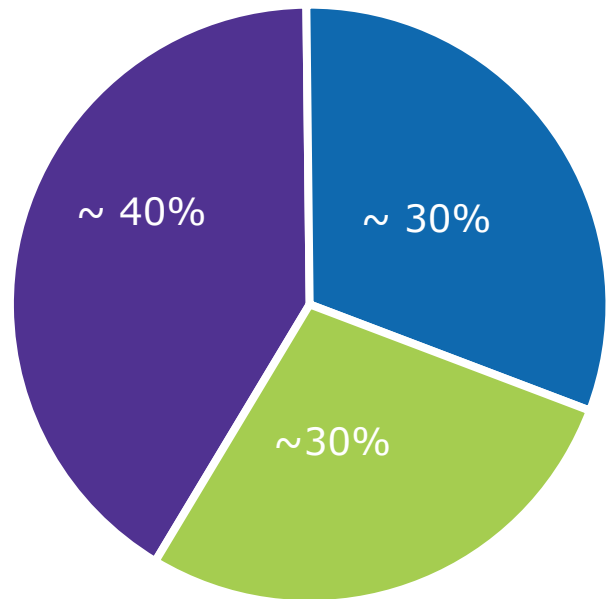
- Organization structure implemented
- High engagement from organization
- Common definition and implementation of processes well underway, e.g. pricing, customer excellence

No disruption of growth momentum during integration

Life Science

Expected synergies identified and fully confirmed

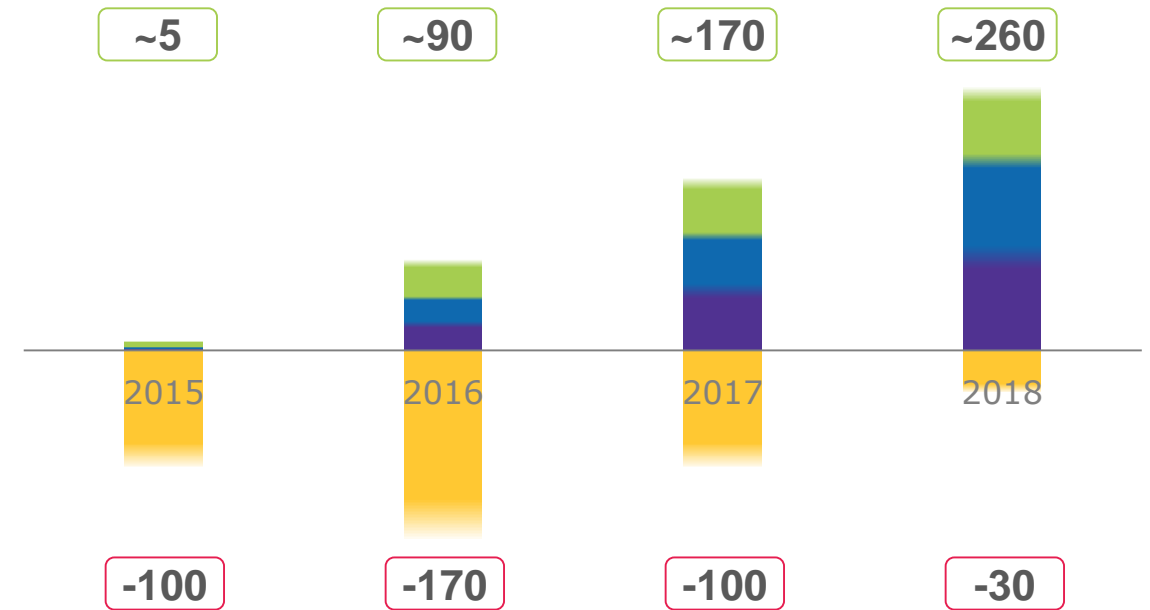
Sources of synergies (3rd full year 2018)



■ Production & Manufacturing ■ Marketing & Selling
■ Administration, R&D

Three major areas for delivering the synergies

Timing of expected synergies and related costs [€m]



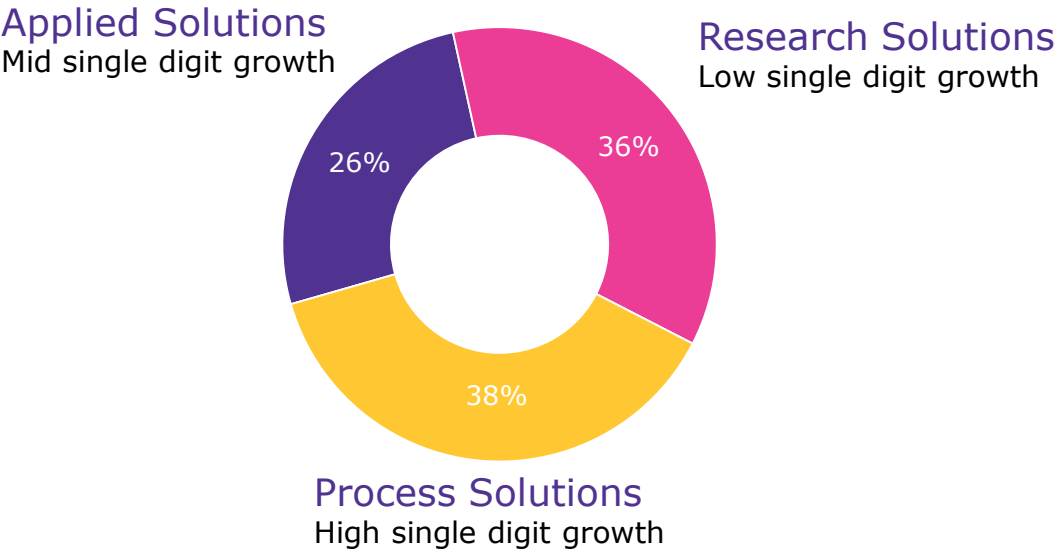
■ Production & Manufacturing ■ Marketing & Selling
■ Administration, R&D ■ Integration costs

Fast synergy ramp-up to reach two thirds of target in 2017

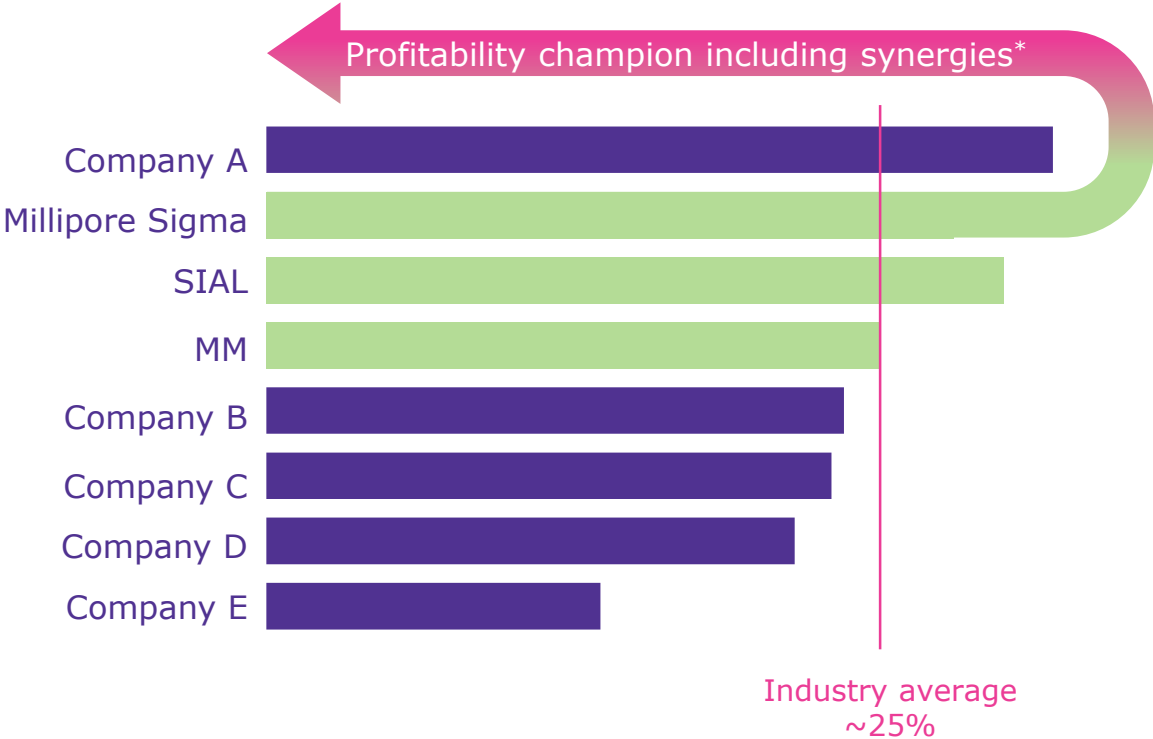
Life Science

We aim to be the profitability champion of the sector

New sales breakdown as of Q2 2016



Above industry margin levels



Life Science is well set for sustainable growth and profitability

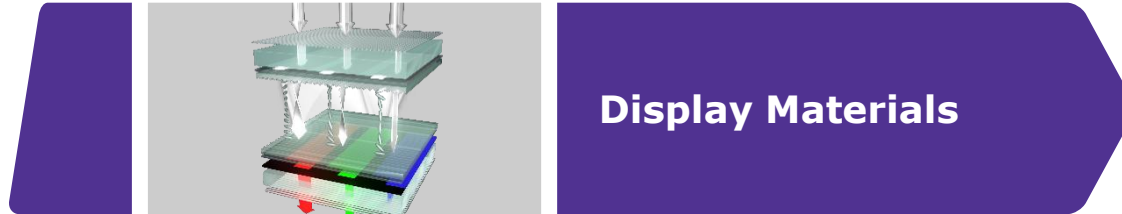


04

**PERFORMANCE
MATERIALS –
STRENGTH AND
INNOVATION**

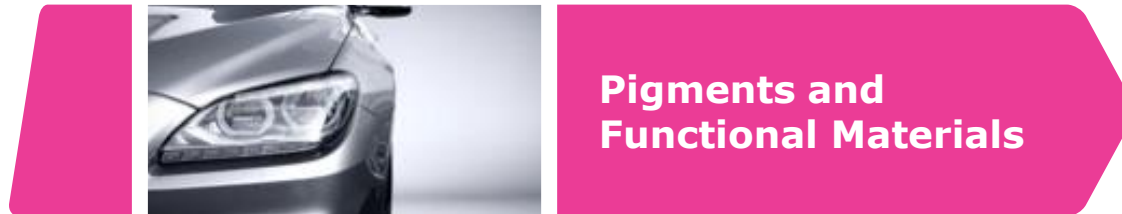
Performance Materials

The four pillars are set for future profitable growth



~50-60% of total sales,

- liquid crystals (LC) and photoresists for TVs, smartphones and tablet computers
- other display and non-display applications (e.g. LC Windows)



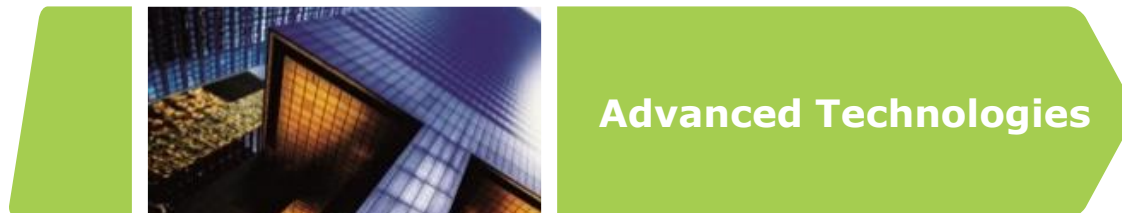
~15-20% of total sales,

- effect pigments and functional materials for coatings, plastics, printing and cosmetics
- functional materials for cosmetics and special applications



~15-20% of total sales,

- dielectrics, colloidal silica, lithography materials (photo resists), yield enhancers, edge-bead removers
- polyimide raw materials and printing materials



~5-10% of total sales,

- organic (OLED) and inorganic (LED) light emitting diodes and functional materials for electronics and energy solutions, especially OLED is providing first substantial sales

Performance Materials

Innovation leadership is the backbone of future profitability and growth

evolutionary



Incremental product adjustments - only minor investments

LC

New singles for PSVA technology, new mode SA-VA

pigments

Meoxal luminous metal effect pigments

ICM¹

low defect CMP² slurries

advanced tech.

Organic Photovoltaics

revolutionary



Fundamental research - more substantial investments needed

LC

Smart windows, smart antennas

pigments

Counterfeiting prevention applications

ICM¹

Directed self-assembly (DSA) in lithography

advanced tech.

OLED printing technology

Performance Materials

Sound platform to deliver high earnings

1 Four-pillar platform diversifies earnings stream

- Liquid Crystals remain key earnings contributor
- AZ* expertise is being leveraged to develop innovative value-added solutions for customers
- OLED is becoming a visible growth driver
- Pigments continue to grow with high-end products

2 Continuous innovation as key profitability driver

- New products contribute high growth and profitability
- LC* technology mode UB-FFS* launched in 2014 is the most recent example

Diversification of portfolio and ongoing innovation lead to strong profitability

Balanced sales and consistently high earnings



We are the innovation leader



*Abbreviations: AZ = AZ Electronics, LC = Liquid crystals, UB-FFS = Ultra Brightness Fringe Field Switching, IPS = In-Plane-Switching, VA = Vertical Alignment, PS-VA = Vertical Alignment with additional polymer layer fabricated from reactive mesogenes

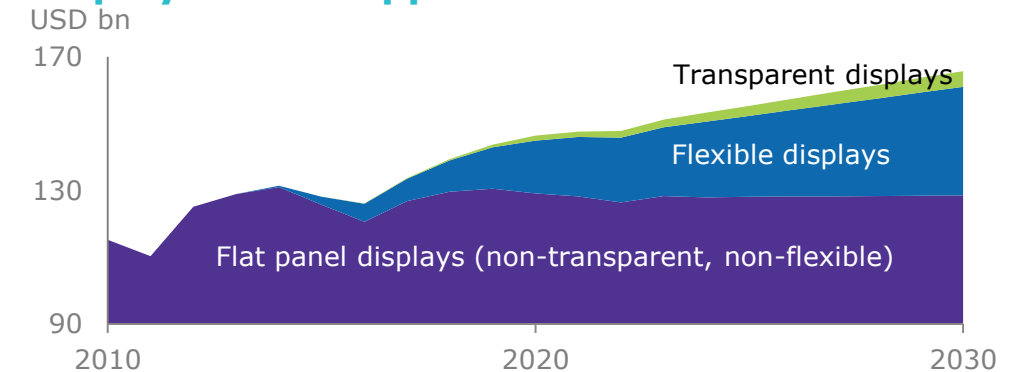
Performance Materials

Long-term growth and profitability drivers are intact

3 Macroeconomics and electronics remain buoyant

- Global consumer electronics market expected to grow above GDP
- Mobile data, Internet of Things and Big Data are key growth drivers for LC and IC
- Display market continues to grow

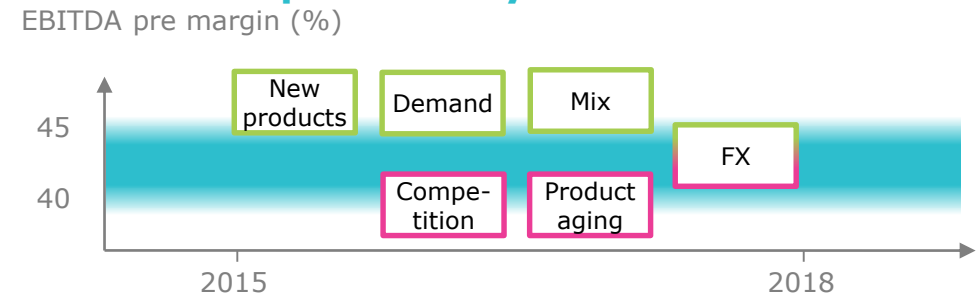
Display market opportunities continue to evolve¹



4 High value-added products yield superior profitability

- High market share in liquid crystals expected to prevail
- Strong differentiation by innovation inherent in nature of business

Sustainable profitability drivers



Unique differentiation and market position will continue to lead to strong profitability and maintain low single-digit growth trajectory



05

**BUSINESS AND
FINANCIAL REVIEW
H1 2016**

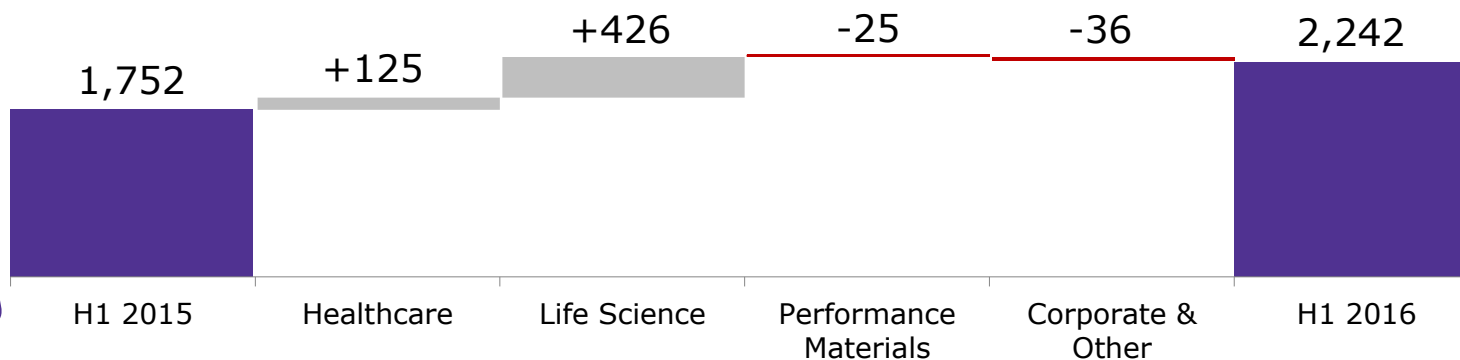
Life Science and Healthcare drive growth and profitability

H1 2016 YoY net sales

	Organic	Currency	Portfolio	Total
Healthcare	6.4%	-7.9%	-1.0%	-2.6%
Life Science	8.5%	-2.1%	80.6%	87.1%
Performance Materials	-3.5%	-0.8%	2.9%	-1.4%
Group	4.9%	-5.1%	19.5%	19.3%

- Growth in Healthcare driven by strong Fertility, GM* as well as Xalkori commissions
- Strong organic growth in Life Science driven by Process Solutions
- Organic decline in Performance Materials reflects destocking in display supply chain
- Portfolio reflects Sigma and Kuvan

H1 YoY EBITDA pre contributors [€ m]



- HC benefits from good organic growth, Rebif commission savings and R&D phasing
- Life Science driven by Sigma, strong organic growth and positive business mix
- Performance Materials slightly lower due to Liquid Crystal sales decrease
- Corporate EBITDA pre contains hedging and investments in corporate initiatives

*General Medicine and CardioMetabolic Care
Totals may not add up due to rounding

H1 2016: Overview

Key figures

[€m]	H1 2015	H1 2016	Δ
Net sales	6,261	7,470	19.3%
EBITDA pre	1,752	2,242	27.9%
Margin (in % of net sales)	28.0%	30.0%	
EPS pre	2.43	3.09	27.2%
Operating cash flow	605	663	9.6%

[€m]	Dec. 31, 2015	Jun. 30, 2016	Δ
Net financial debt	12,654	12,510	-1.1%
Working capital	3,448	3,813	10.6%
Employees	49,613	50,456	1.7%

Comments

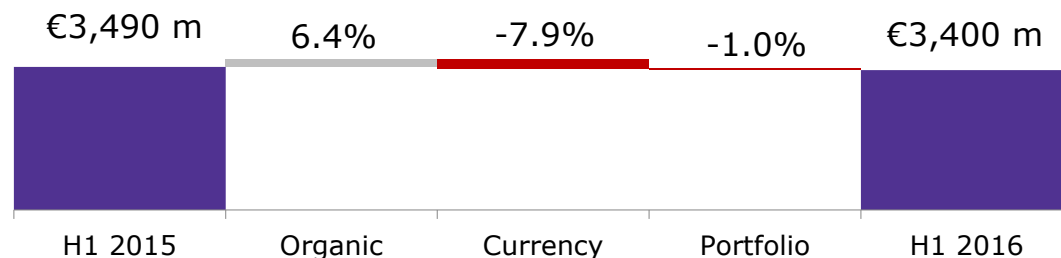
- EBITDA pre & margin increase driven by Sigma, organic performance and end of Rebif commission expenses
- EPS pre grows in line with EBITDA pre
- Healthy operating cash flow driven by strong business performance
- Net financial debt reflects cash-in for Kuvan & operating cash flow partially offset by dividend payments
- Working capital shows increase in business activity – further room for improvement

Healthcare: Good organic growth and product mix drive profitability

Healthcare P&L

[€m]	H1 2015	H1 2016
Net sales	3,490	3,400
Marketing and selling	-1,390	-1,256
Administration	-135	-137
Research and development	-706	-756
EBIT	536	939
EBITDA	910	1,387
EBITDA pre	941	1,065
Margin (in % of net sales)	27.0%	31.3%

Net sales bridge

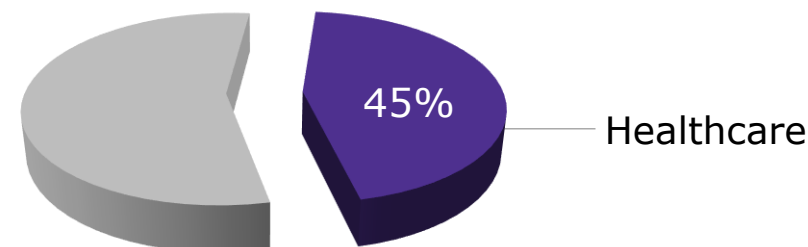


*Productive Development Partnership
Totals may not add up due to rounding

Comments

- Rebif still impacted by ramp-up of competition in Europe, while U.S. pricing, Russian tender and PDP* in Brazil support performance
- Erbitux shows solid organic growth benefiting from volume increase in all regions, but also low comparables; EU remains competitive
- Marketing & selling reflects end of commission expenses for Rebif (U.S.) partially offset by reinvestments in sales force & launch preparations
- R&D spend increases as pipeline development progresses
- EBIT reflects Kuvan disposal gain of €324 m in Q1 2016
- Profitability improves due to good organic growth, end of Rebif commissions and ~€30m disposal gain from Merck KGaA, Darmstadt, Germany Ventures minority

H1 2016 share of group net sales

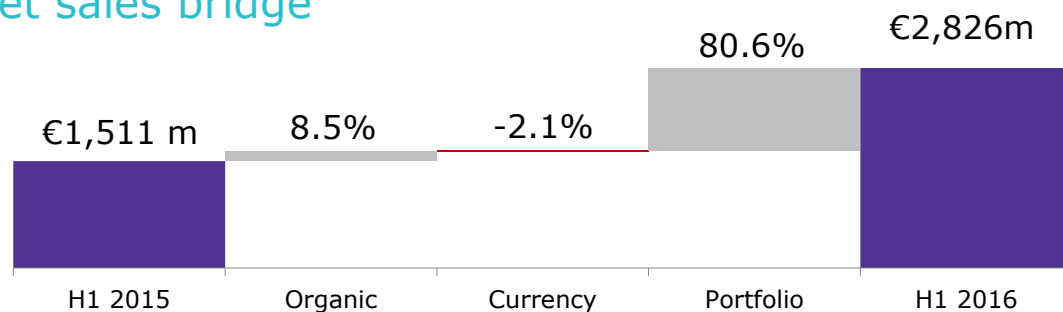


Life Science: A strong first half of 2016

Life Science P&L

[€m]	H1 2015	H1 2016
Net sales	1,511	2,826
Marketing and selling	-477	-833
Administration	-59	-121
Research and development	-94	-126
EBIT	170	271
EBITDA	334	627
EBITDA pre	384	810
Margin (in % of net sales)	25.4%	28.6%

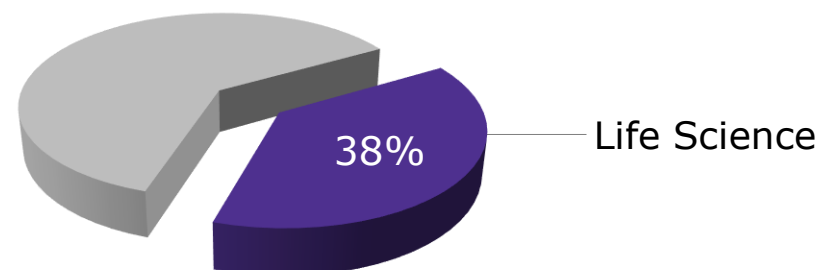
Net sales bridge



Comments

- Very strong growth of Process Solutions driven by increasing biopharma production and single-use demand across all regions
- Applied Solutions shows moderate organic growth, driven by bio-monitoring products for pharma & demand for analytical testing
- Research Solutions benefits from increased research on biologics as well as solid demand for high-value chemicals
- Cost base contains Sigma, but improves in relation to sales
- Profitability reflects Sigma, business mix and synergies

H1 2016 share of group net sales

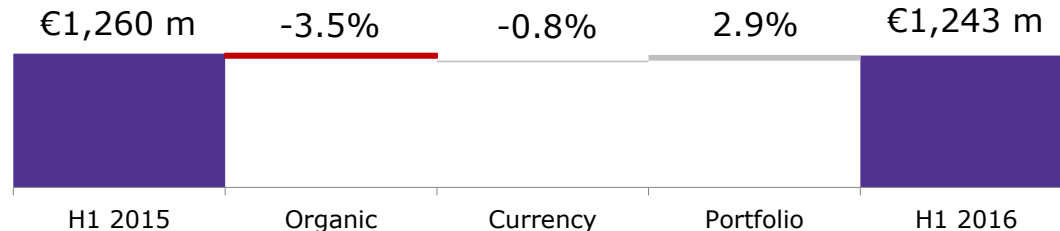


Performance Materials: Healthy profitability amid destocking of display industry inventories

Performance Materials P&L

[€m]	H1 2015	H1 2016
Net sales	1,260	1,243
Marketing and selling	-99	-116
Administration	-32	-31
Research and development	-95	-101
EBIT	452	399
EBITDA	572	534
EBITDA pre	572	547
Margin (in % of net sales)	45.4%	44.0%

Net sales bridge

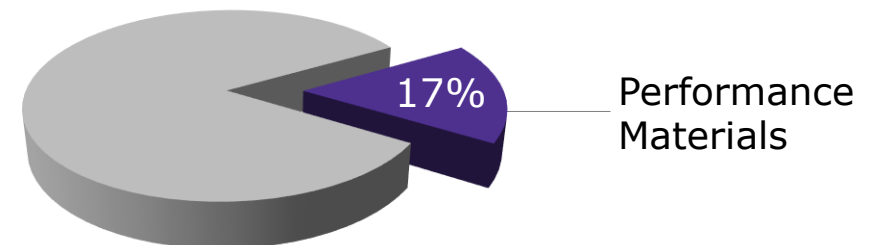


*Active pharmaceutical ingredient
Totals may not add up due to rounding

Comments

- LC impacted by volume declines of mature TN-TFT and indicated inventory correction in supply chain, expected to continue into H2
- OLED continues to grow on industry capacity expansion & investments
- Integrated Circuit Materials (ICM) shows solid above-market growth mainly driven by dielectric materials for chip production
- Pigments & Functionals post solid growth esp. due to cosmetic API*
- Marketing & selling reflects contribution from Sigma's SAFC Hitech
- Healthy profitability due to leading market position with highly differentiated products, despite destocking in display supply chain

H1 2016 share of group net sales





06 OUTLOOK

Group

We are well set for profitable and sustainable growth



Maximize growth of existing franchises
Deliver on pipeline



Focus on seamless integration and deliver cost synergies
Leverage strategic capabilities for value creation



Drive innovation and technology leadership across all businesses
Innovate in applications beyond displays

Group Upgrade of full-year 2016 guidance

Guidance for 2016

▶ **Net sales:** ~ €14.9 – 15.1 bn ◀

▶ **EBITDA pre:** ~ €4,250 – 4,400 m ◀

▶ **EPS pre:** ~ €5.85 – 6.10 ◀





Appendix

01 Guidance details

02 Healthcare

03 Life Science

04 Financial details



01

GUIDANCE DETAILS

2016 business sector guidance



Net sales

- Solid organic growth
- Organic Rebif decline
- Strong growth in Fertility
- Other franchises growing

EBITDA pre

~ €1,950 – 2,050 m



Net sales

- Mid to high single-digit organic growth
- Main driver Process Solutions
- High double-digit contribution from Sigma

EBITDA pre

~ €1,620 – 1,670 m



Net sales

- Moderate organic decline
- Improving macro signals amid destocking in liquid crystals
- Growing demand in all businesses

EBITDA pre

~ €1,100 – 1,150 m

Additional financial guidance 2016

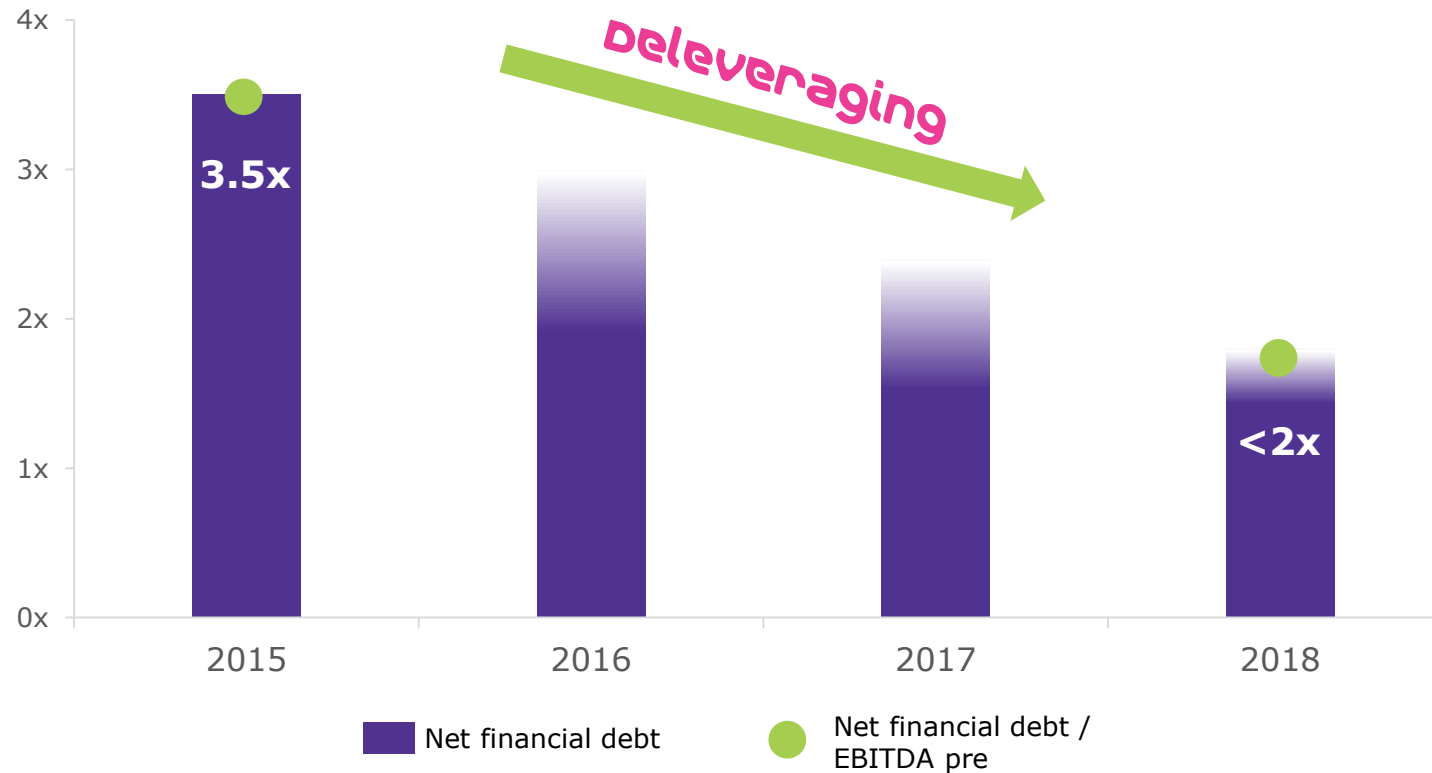
Further financial details

Corporate & Other EBITDA pre	~ -€370 – -400 m
Interest result	~ -€270 – -300 m
Intangibles amortization from Sigma PPA	~ €250 – 300 m p.a.
Underlying tax rate	~23% to 25%
Capex on PPE	~€750 – 800 m
Hedging/USD assumption	2016 & 2017 hedge ratio ~40%-45% at EUR/USD ~1.10 to 1.15
2016 Ø EUR/USD assumption	~1.07 – 1.12

Strong focus on cash generation to ensure swift deleveraging

Net debt and leverage development

[Net debt/
EBITDA pre]



Focus on deleveraging

- Commitment to swift deleveraging to ensure a strong investment grade rating and financial flexibility
- Strong cash flow will be used to drive down leverage to expected <2x net debt/EBITDA pre in 2018
- Larger acquisitions (>€500 m) ruled out for the next two years (or financed by divestments)

Group

We have clear financial priorities for the next two years



Focus on **cash flow**
and **deleveraging**

- **Strong cash flow** will be used to drive down gearing to <2x net debt / EBITDA pre in 2018
- **Larger acquisitions (>€500m) ruled out** for the next two years (or financed by divestments)
- **Dividend policy** reflects sustainable earnings trend



Ongoing cost discipline

- **Synergy generation** is utmost priority
- **Cost discipline** continues in all business sectors
- **Further efficiency gains** from ongoing improvement and harmonization of processes and systems



**Efficient capital
allocation**

- **All our businesses** have growth potential
- **Decisions on growth investments** are based on sound business cases and robust clinical data

Near-term financial priorities will secure our profitable growth path

High cost base in strong currencies and hedging losses partially offset FX tailwinds



Healthcare

Sales

- Global presence
- ~40% of sales in Europe

Costs

- High Swiss franc cost base due to manufacturing sites
- R&D hub and notable sales force in U.S.

FX Impact



Life Science

Sales

- Balanced regional sales split between EU, NA and RoW

Costs

- Extensive manufacturing and research footprint in the U.S.
- Global customer proximity requires broad-based sales force

FX Impact



Performance Materials

Sales

- ~80% of sales in Asia-Pacific
- Industry is USD-driven

Costs

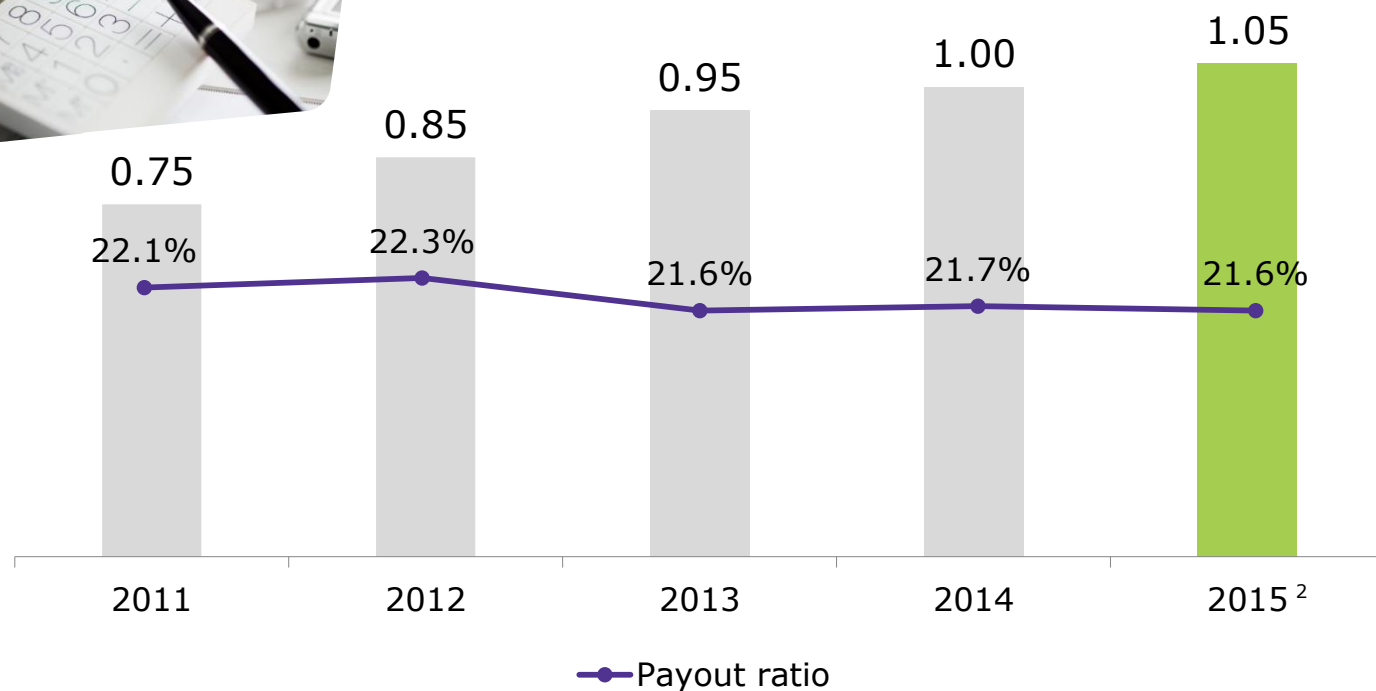
- Main production sites in Germany
- Several R&D and mixing facilities in Asia

FX Impact



Sustainable dividend development

Dividend¹ development 2011-2015

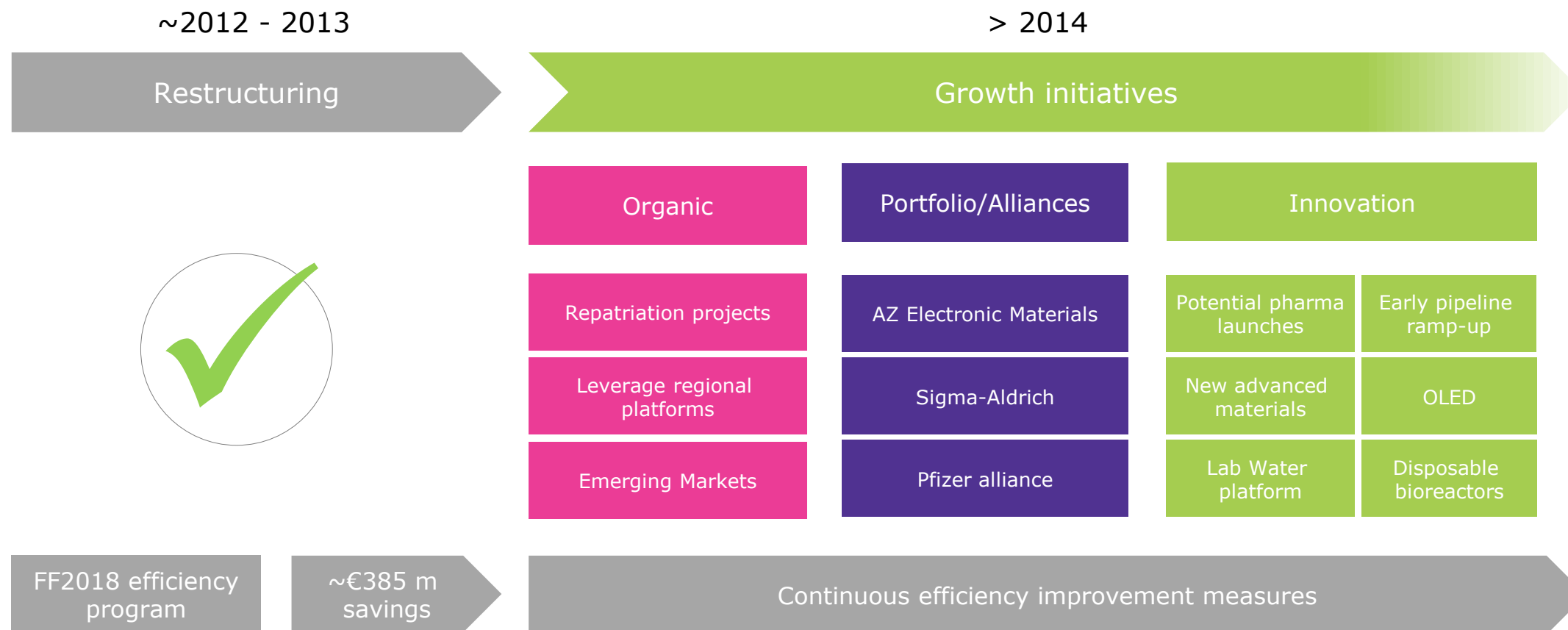


2015 dividend and policy

- Dividend of €1.05 per share in 2015
- Last year's dividend constitutes the minimum level²
- Development of dividends in line with business performance and earnings progression
- Aiming for a corridor of 20%-25% of EPS pre

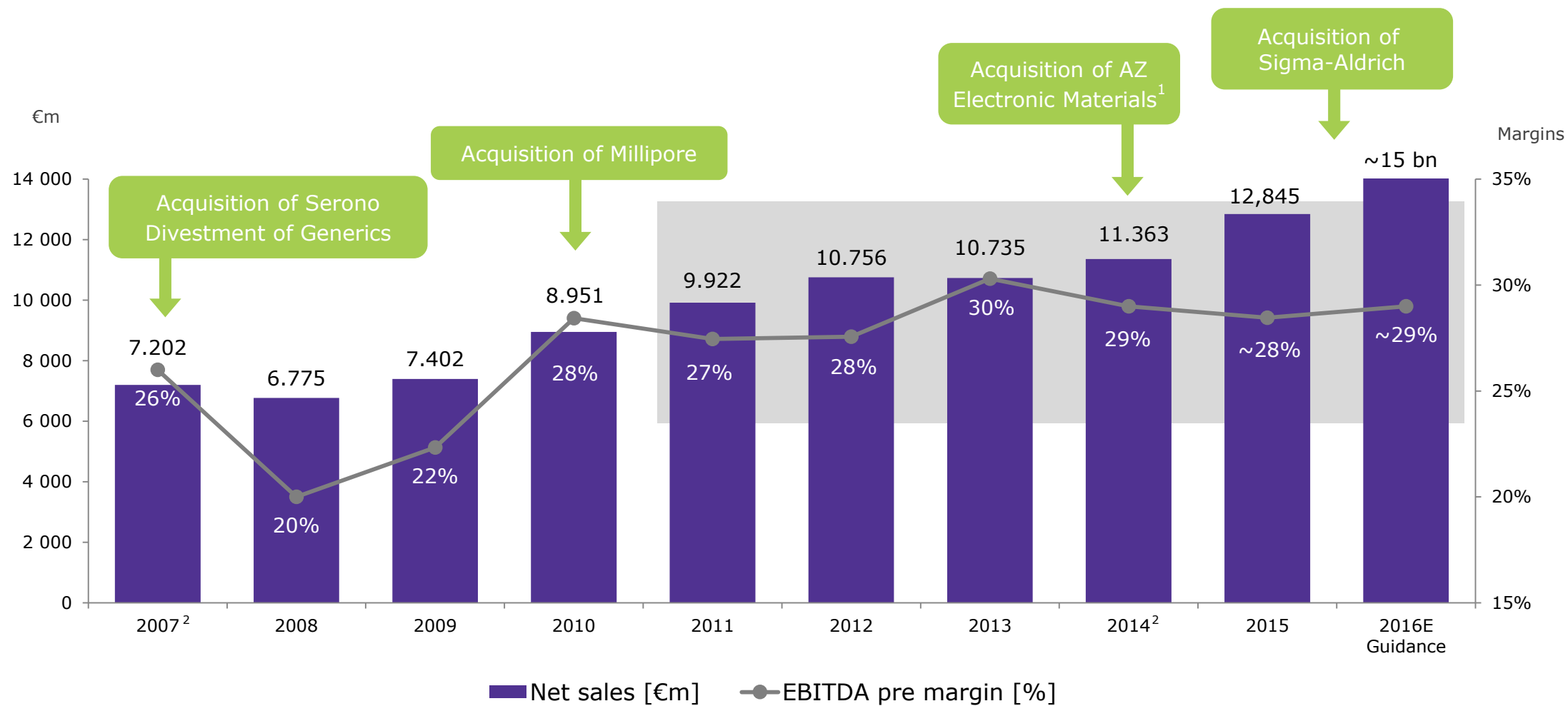
Group

Strategic agenda 2018 – milestones achieved



Group

Profitability improved fundamentally



¹Included since 2 May 2014; ²2007 and 2014 EBITDA pre margin adjusted for comparability



02 HEALTHCARE

Portfolio management: Differentiating across diverse business models

General Medicine portfolio



- Limited risk with high cash generation
- Sustainable steady growth fueled by Emerging Markets



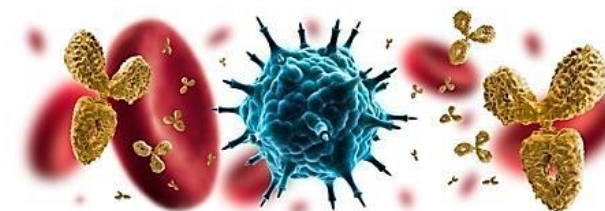
Biologicals portfolio



- Moderate risk and reward profile
- Economies of scale due to state-of-the-art production capabilities
- Emerging Markets gain importance



Oncology & Immunology innovation portfolio



- High reward at high risk
- Innovation key success factor – high R&D spend
- Promising pipeline projects



Mid-term, all parts of the portfolio need to earn their cost of capital

The road to maximizing existing franchises is clear



Continue to drive front-line mCRC share by increasing patient testing and expanding head and neck coverage



Capitalize on strong efficacy and new smart devices to maximize differentiation and defend franchise



Build on No.1 position and ART¹ channel access with embryo diagnostics and other innovative technologies



Harness strengths of existing business and build a new focus area driven by innovative devices and services for patients



Build on existing track record in Emerging Markets, drive brand and life-cycle management and expand business including asset repatriation



Clinical pipeline

Phase I

Tepotinib
c-Met kinase inhibitor
Solid tumors

M2698
p70S6K & Akt inhibitor
Solid tumors

M3814
DNA-PK inhibitor
Solid tumors

Beigene-283
BRAF inhibitor
Solid tumors

Avelumab
Anti-PD-L1 mAb
Solid tumors

Avelumab
Anti-PD-L1 mAb
Hematological malignancies

M9241 (NHS-IL12)¹
Cancer immunotherapy
Solid tumors

M7824
Bifunctional immunotherapy
Solid tumors

M1095 (ALX-0761)
Anti-IL-17 A/F nanobody
Psoriasis

M2951
BTK inhibitor
Systemic lupus erythematosus

Phase II

M2736 (ATX-MS-1467)
Immune tolerizing agent
Multiple sclerosis

Tepotinib
c-Met kinase inhibitor
Non-small cell lung cancer

Tepotinib
c-Met kinase inhibitor
Hepatocellular cancer

Avelumab
Anti-PD-L1 mAb
Merkel cell carcinoma

Sprifermin
Fibroblast growth factor 18
Osteoarthritis

Atacicept
Anti-Blys/anti-APRIL fusion protein
Systemic lupus erythematosus

M2951
BTK inhibitor
Rheumatoid arthritis

Phase III

Avelumab – Anti-PD-L1 mAb
Non-small cell lung cancer 1L²

Avelumab – Anti-PD-L1 mAb
Non-small cell lung cancer 2L³

Avelumab – Anti-PD-L1 mAb
Gastric cancer 1L²

Avelumab – Anti-PD-L1 mAb
Gastric cancer 3L⁴

Avelumab – Anti-PD-L1 mAb
Bladder cancer 1L²

Avelumab – Anti-PD-L1 mAb
Ovarian cancer platinum resistant/refractory

Avelumab – Anti-PD-L1 mAb
Ovarian cancer 1L²

Avelumab – Anti-PD-L1 mAb
Renal cell cancer 1L²

MSB11022
Proposed biosimilar of Adalimumab
Chronic plaque psoriasis

Registration

Cladribine Tablets⁵ –
Lymphocyte targeting agent
Relapsing-remitting multiple sclerosis

- Neurodegenerative Diseases
- Oncology
- Immunology
- Immuno-Oncology
- Biosimilars

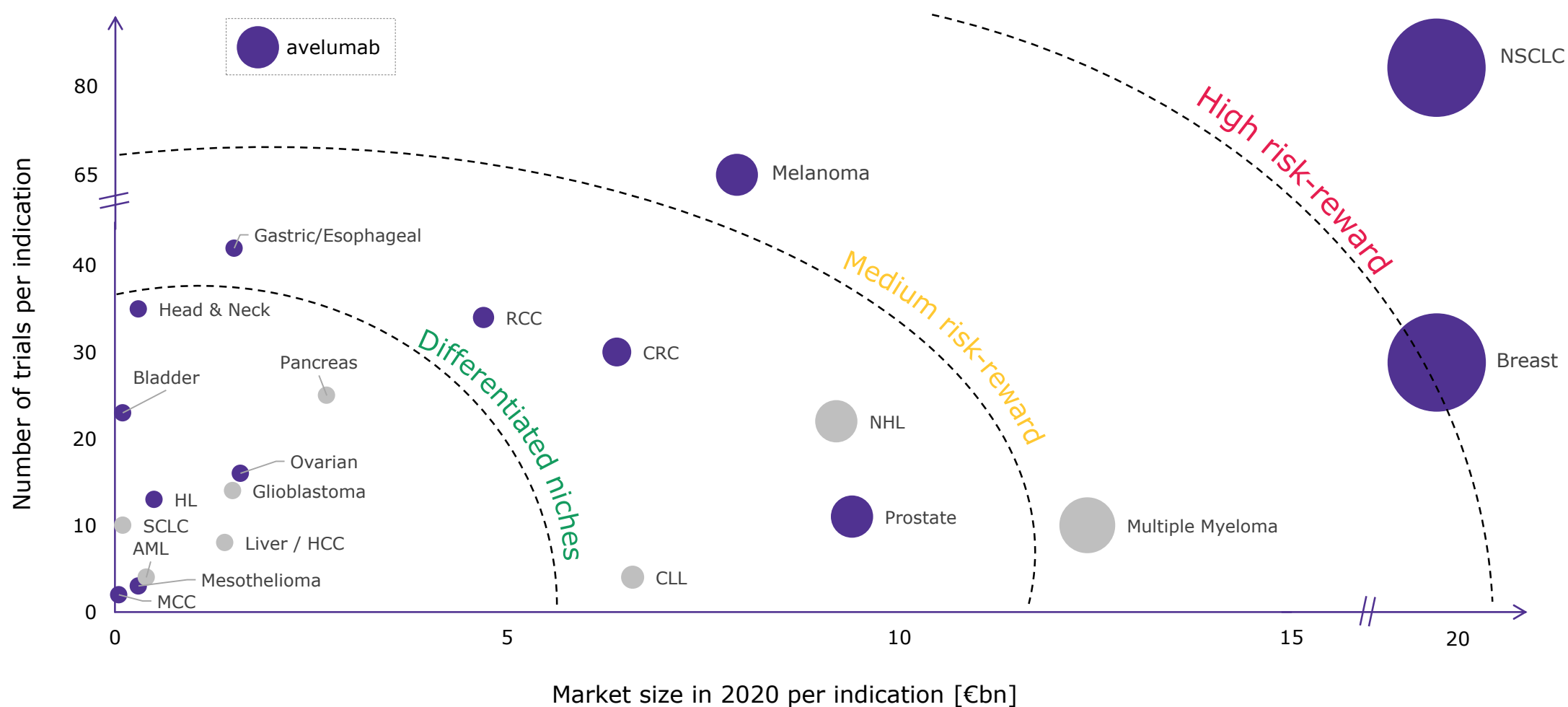
Pipeline as of July 28th, 2016

Pipeline products are under clinical investigation and have not been proven to be safe and effective.
There is no guarantee any product will be approved in the sought-after indication.

¹Sponsored by the National Cancer Institute (USA); ² 1st line treatment; ³ 2nd line treatment; ⁴ 3rd line treatment

⁵As announced on July 18th, 2016 the European Medicines Agency accepted Merck's KGaA, Darmstadt, Germany Marketing Authorization Application

Avelumab plays predominantly in attractive and differentiated niches



Sources: Trialtrave and Cortellis as of September 2015, Boston Consulting Group, Evaluate Pharma forecast 2020
 Acronyms: SCLC = Small Cell Lung Cancer; HL = Hodgkins Lymphoma; NHL = Non Hodgkins Lymphoma; AML = Acute Myeloid Leukaemia

Avelumab – Differentiation strategy varies according to chosen target indication and market

1

Unsaturated
and / or niche
indications

Ambition: Smart leader

- Indications (Merkel cell) or markets (Asia for gastric)
- Quick to market strategy, e.g. BTD for MCC in November 2015
- Small, but less crowded markets and sales potential with notable impact for us
- Strategic strength of Healthcare in niche markets

2

Saturated
and / or major
indications

Ambition: Smart follower

- Indications such as NSCLC or Bladder
- Learn from experience of incumbents/early movers
- Potential for combinations given breadth of combined development pipelines, e.g. lung
- Differentiate in trial design and explore application of further biomarkers



The alliance initiated 8 Phase III studies

1 Ovarian Plat res/ref

- Estimated patient enrolment: 550
- Comparator: Pegylated liposomal doxorubicin
- Estimated primary completion: H1 2018*

2 Bladder 1L maint.

- Estimated patient enrolment: 668
- Comparator: Best supportive care
- Estimated primary completion: H1 2019*

3 Gastric 1L maint.

- Estimated patient enrolment: 668
- Comparator: Best supportive care
- Estimated primary completion: H1 2019*

4 Gastric 3L

- Estimated patient enrolment: 330
- Comparator: Physician's choice of chemotherapy/BSC
- Estimated primary completion: H1 2018*

5 NSCLC 1L

- Estimated patient enrolment: 420
- Comparator: Physician's choice of platinum containing chemotherapy
- Estimated primary completion: H1 2018*

6 NSCLC 2L

- Estimated patient enrolment: 650
- Comparator: docetaxel/chemotherapy
- Estimated primary completion: H2 2021*

7 Ovarian 1L

- Estimated patient enrolment: 951
- Comparator: platinum-based chemotherapy
- Estimated primary completion: H2 2019*

8 Renal cell 1L

- Estimated patient enrolment: 583
- Comparator: sunitinib
- Estimated primary completion: H1 2018*

MCC 2L: Clinical results support avelumab as potential therapeutic option – planned to apply for marketing authorization in H2 2016

Encouraging response rates¹

- ORR: 31.8%
 - 9.1% complete response
 - 22.7% partial response
 - Rapid (78.6% responding within 7 weeks of treatment)
 - Durable (82.1% still responding at time of analysis)
- 6-mo OS: 69% (median OS: 11.3 months)
- 6-mo PFS rate: 40%
- Manageable safety profile; no unexpected safety signals

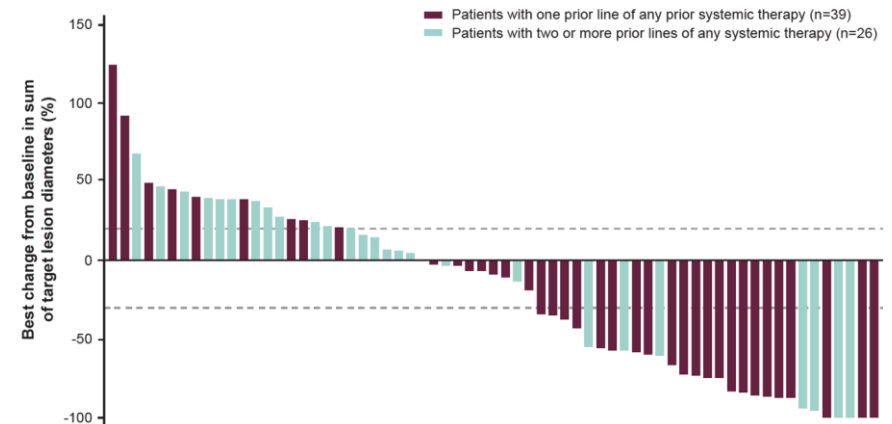


Note: timelines are event-driven and may change

¹Avelumab (MSB0010718C; anti-PD-L1) in patients with metastatic Merkel cell carcinoma previously treated with chemotherapy: results of the phase 2 JAVELIN Merkel 200 trial* / Oral Presentation at the 52nd ASCO Annual Meeting, June 3-7, 2016; Chicago, Illinois. Abstract No. 9508; Howard Kaufman et al.

Potential for differentiation

- Largest international multicenter, open-label study of anti-PD-L1/PD-1 reported in this patient population (88 patients) – Responses observed in large number of patients
- Improved response rates observed when used earlier, i.e. fewer lines of prior chemotherapy appeared to be associated with better response to avelumab in MCC 2L and beyond
 - ORR of 40.4% for patients with one prior systematic treatment
 - ORR of 19.4% for patients with two and more prior treatments



Going forward, avelumab combinations will drive differentiation strategy



- Phase II 2L MCC (BTD, ODD and FTD)
- Phase III 1L and 2L Plat res/ref ovarian
- Phase III 1L MN and 3L gastric
- Phase III 1L and 2L NSCLC
- Phase III 1L MN bladder
- Phase I Hodgkins Lymphoma
- Multiple other tumor types



- Phase III, RCC 1L (avelumab + Inlyta)
- Phase Ib/II, NSCLC 1L ALK+ (avelumab + Xalkori/lorlatinib)
- Phase I/II (avelumab + 4-1BB)
- Phase Ib/II, ovarian (avelumab + Entinostat; Syndax collaboration)
- Phase I/Ib, ovarian (avelumab + VS-6063; Verastem collaboration)
- Further combination trials under consideration

Cladribine tablets – MAA submission accepted by EMA in July 2016

Background

- Targets lymphocytes (both B and T cells), integral to MS pathogenesis
- Two Phase III and one Phase IIIb extension studies conducted in RRMS and early MS^{1,2,3}; Phase II study in patients failing IFN beta therapy⁵
- Substantial new efficacy & safety characterization including data from long-term follow up (>10,000 patient-years)
- Most recent analyses provide relevant information on benefit/risk profile of cladribine tablets in RRMS:
 - ARR reduction (58%)
 - Risk of disability progression (33% reduction)
 - Relative reduction in mean number of lesion (86% reduction in T1 gadolinium-enhanced lesions)
 - 47% of patients experience NEDA over 2 years⁴

Potential for differentiation

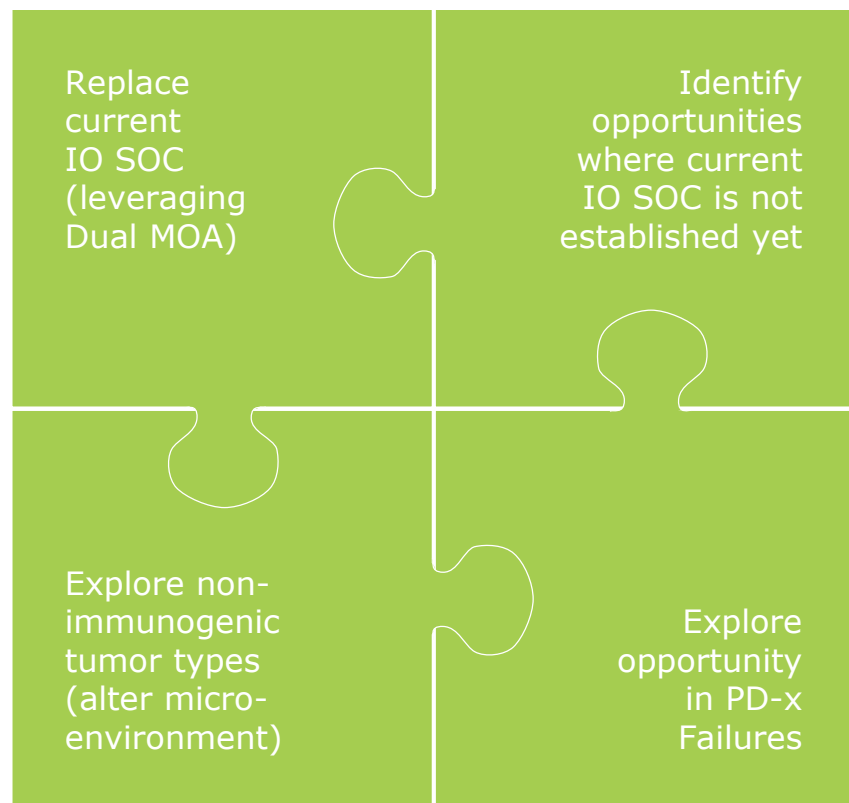
- We aim to address significant unmet needs for agents delivering high efficacy with favorable safety profile in a convenient dosing regimen
- Administered orally (tablet formulation)
- Extremely short treatment courses (8–10 days per year) leading to long-term efficacy¹

Note: timelines are event-driven and may change

EMA = European Medicines Agency; ARR = Annualized Relapse Rate; MAA = Marketing Authorization Application; MS = multiple sclerosis; NEDA = no evidence of disease activity; RRMS = relapsing-remitting multiple sclerosis. ¹ Giovannoni G et al. New Engl J Med 2010;362:416–26; ² Giovannoni G et al. 65th annual meeting of the American Academy of Neurology 2013. P07.119. ³ Leist TP et al. Lancet Neurol 2014;13:257–67. ⁴ Giovannoni G et al. Lancet Neurol. 2011;10:329–37. ⁵ Montalban X et al. 65th annual meeting of the American Academy of Neurology 2013. P07.099.

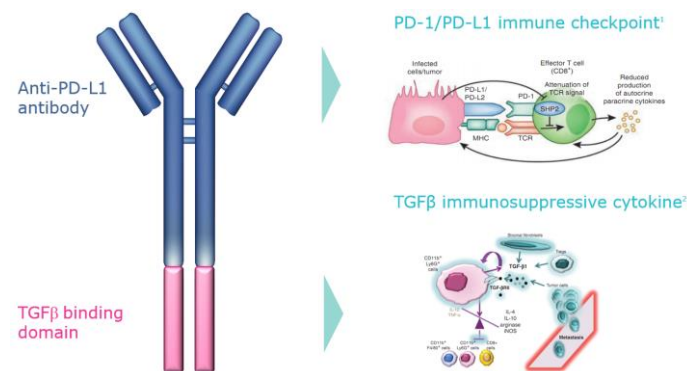
PD-L1–TGF-beta indicates potential to move beyond checkpoint inhibitors

Four focus areas for exploration



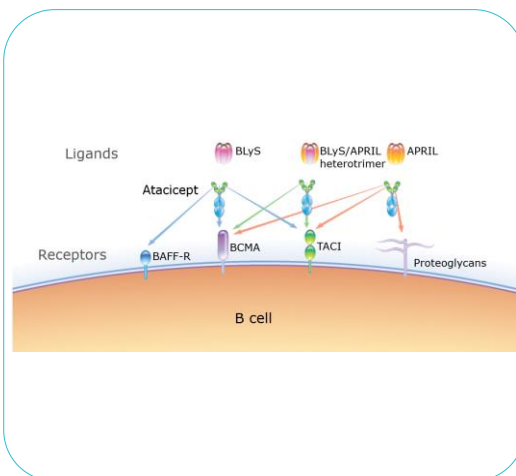
Status and next steps

- Novel, first-in-class bifunctional immunotherapy
- Bifunctional mode should result in broader application vs. respective mono-functional agents
- Great potential when combined with Standard of Care, immunotherapy and internal pipeline drug candidates
- Dose level finding of Phase I completed
- Expansion into Ib cohorts expected for Q3 2016



Update on selected assets (1/2)

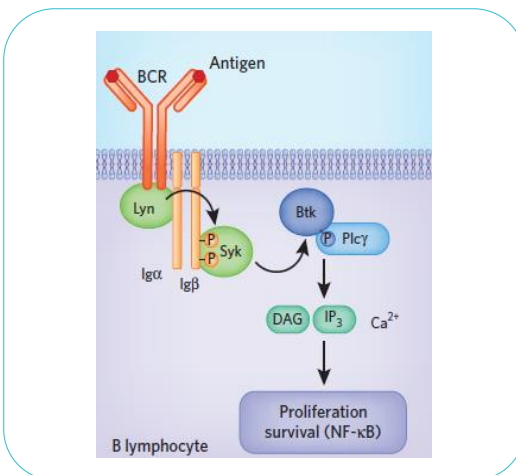
Atacicept



- Binds to receptors of two cytokines regulating maturation, function, and survival of B cells (B-lymphocyte stimulator (BLyS) & a proliferation-inducing ligand (APRIL))
- ADDRESS II (Ph IIb) in SLE patients aiming to show reduction in disease activity – 279 patients enrolled
- 24-week, randomized, double-blind, placebo-controlled Subcutaneous injection, once-a-week dosing
- Primary outcome: Percentage of patients with SLE responder index (SRI) response at week 24 compared to screening

Phase III decision expected in H2 2016

BTK

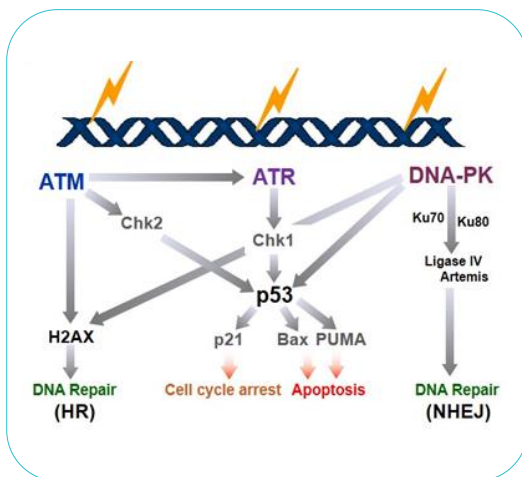


- Suppress autoantibody-producing cells
- Preclinical research suggests therapeutic use in certain autoimmune diseases
- High and differentiated efficacy in preclinical models; promising kinase selectivity profile
- Aim to achieve best in class through minimization of off-target effects
- 2nd dose level of Phase I completed
- Partnering opportunities under consideration

Three phase II trials expected to be started until end of 2016 (e.g. RA, SLE)

Update on selected assets (2/2)

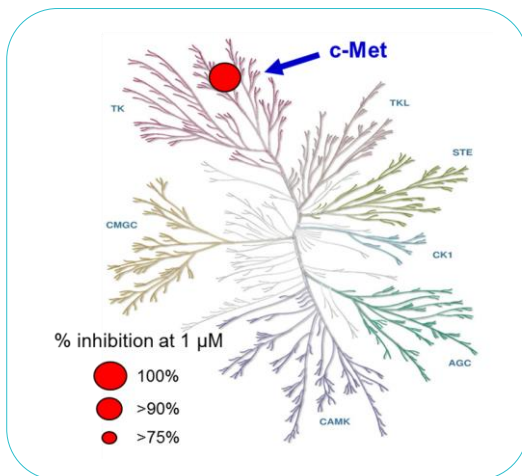
DNA-PK inhibitor



- M3814 is a selective and potent inhibitor of DNA-PK, a kinase mediating DNA double strand break repair¹
- Preclinical PoC showing complete responses and/or increased PFS in combination with radiotherapy in several xenograft models (SCCHN, NSCLC, CRC, PaCa) and strong pre-clinical combination data with SoC chemotherapies
- Two Phase Ia trials ongoing: FIM (monotherapy): 5th dose level completed, MTD not yet reached; RT combination: recruitment ongoing

Analysis of Phase I data for RT combination expected in H2 2017

Tepotinib



- Highly selective small molecule c-Met inhibitor
- Active in ligand-dependent and ligand-independent tumor models
- Biomarker-driven approach for patient selection
- Preliminary data show encouraging signs of anti-tumor activity in c-Met positive patients in NSCLC and HCC^{2,3}
- Phase II trials in progress in NSCLC and HCC

Analysis of Phase II data for HCC and NSCLC expected in H1 2018

Note: timelines are event-driven and may change

¹Graphics only illustrative; Acronyms: SCCHN = Squamous Cell Carcinoma of the Head and Neck, NSCLC = Non-small Cell Lung Cancer, CRC = Colorectal Cancer, PaCa = Pancreatic Cancer, HCC = Hepatocellular Cancer, PFS = Progression-free Survival, SoC = Standard of Care, FIM = First-in-Man, RT = radiotherapy, CT = chemotherapy, MTD = maximum tolerated dose; ²Qin, ECC 2015, (3) Kim et al, IASCL-WCLC 2015

Outlook – MCC submission planned in H2 2016

Avelumab (MCC 2L)	▶	Expected submission	▶	H2 2016
Atacicept	▶	Phase III decision	▶	H2 2016
BTK	▶	Start three Phase II trials	▶	H2 2016
PD-L1-TGF-beta	▶	Signals of activity in cohorts	▶	H1 2017
DNA-PK inhibitor	▶	Analysis of Phase I data	▶	H2 2017
Tepotinib	▶	Analysis of Phase II data	▶	H1 2018

Healthcare

Investments in future growth

R&D*

- Immuno-Oncology: avelumab and ramp-up of earlier pipeline projects +€150-200m cost increase in 2016
- Oncology/Immunology, e.g. tepotinib, BTK inhibitor: mid to high double-digit €m cost increase in 2016

Marketing & Selling*

- Launch readiness to be ensured for avelumab and cladribine
- Costs for launch preparation in the mid to high double-digit €m range in 2016

- **Cost discipline remains high on the agenda**
- **Stringent pipeline assessments continue**
- **Investments based on sound business cases and robust clinical data**

Long-term growth investments partly mitigated by strict cost management

*For scenario that pipeline catalysts materialize

Healthcare is well set for future growth

Stable existing business

Business and market specific initiatives in place to maximize existing business franchises

Strong R&D pipeline

Diversified but focused pipeline with high quality assets in the areas Immuno-Oncology, Oncology and Immunology healthily spread across all clinical phases

Successful collaborations

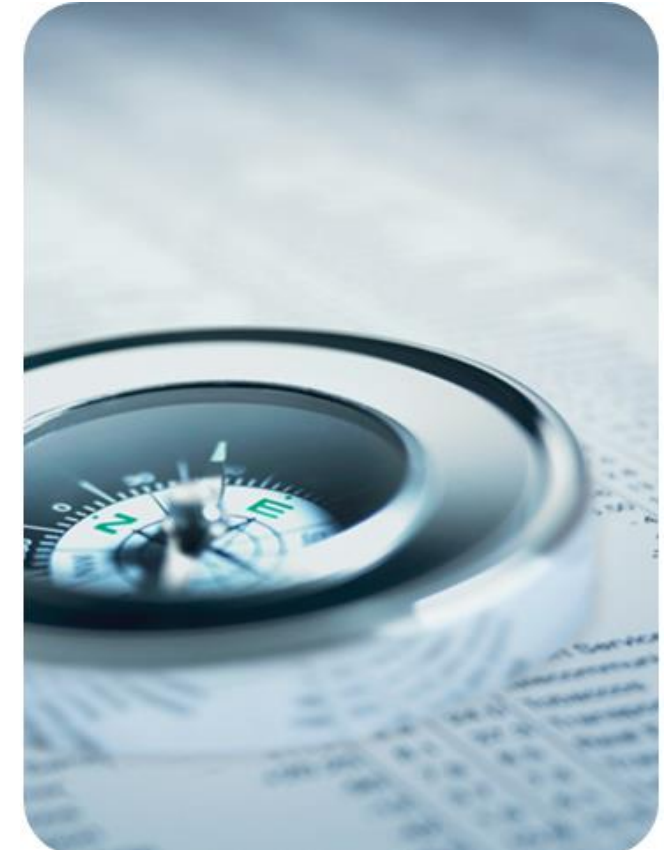
Proven success in partnering through joint investments and collaborations – maximizing potential of assets in competitive space

Promising late stage progress

Two expected submissions in 2016 may potentially result in product launches in 2017

Disciplined execution

Systematic pipeline review and timely decision making allow efficient resource and budget allocation

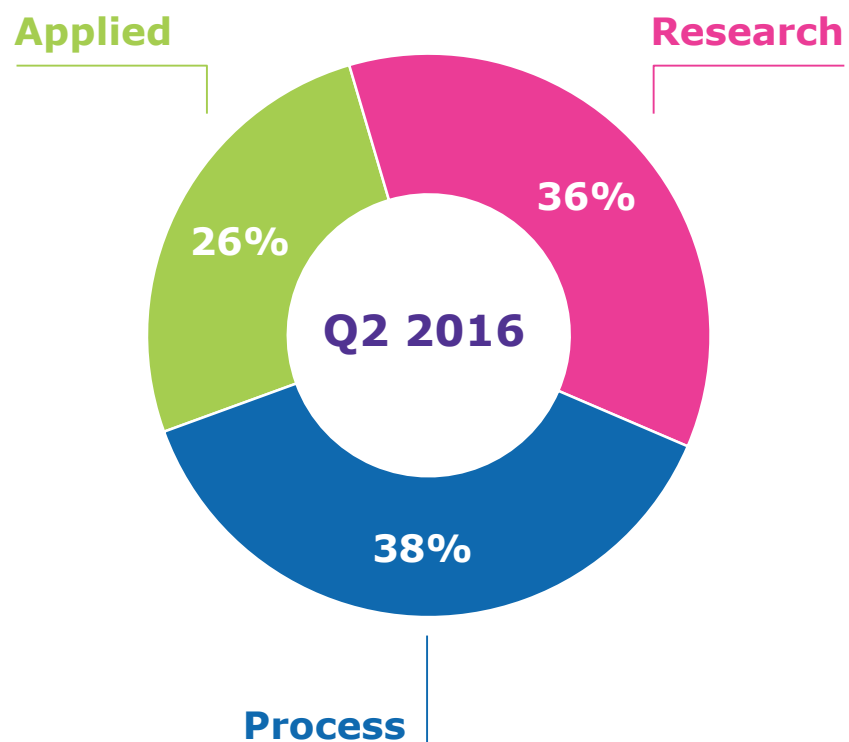




03 LIFE SCIENCE

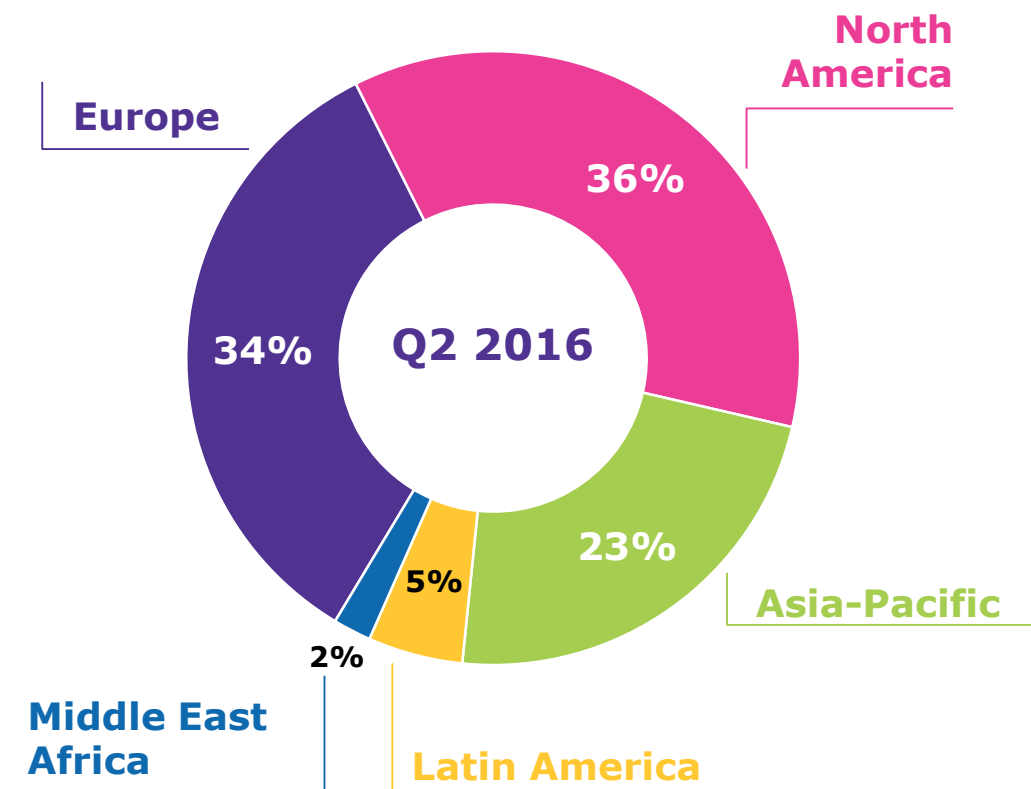
A balanced portfolio and geographic presence

Sales by business unit



FY 2015
pro-forma*
sales:
€5.3 bn

Sales by region



Life Science is an attractive market

RESEARCH

~€42 bn

Low single digit



- Growth in volume of experiments
- Mild growth in academic funding
- Investment in industry R&D

PROCESS

~€38 bn

High single digit



- Drug volume growth
 - from biologics
 - from emerging modalities
- Continued shift to single-use

APPLIED

~€45 bn

Mid single digit



- Volume growth from
 - Population growth
 - Increased testing needs

Success driven by portfolio breadth and differentiation, a customer-centric approach and world-class capabilities

RESEARCH



Broad, relevant and innovative portfolio

Simple customer interface

Ability to manage complexity across organization (e.g., reliability of supply)

PROCESS



Developed market:
Deep expertise in each unit operation

Emerging market:
Broad portfolio

Demonstrated quality & regulatory leadership

APPLIED



Customized workflows for specific applications

Ability to manage complexity across organization (e.g., reliability of supply)

Demonstrated quality & regulatory leadership

Process Solutions

Our end-to-end portfolio for manufacturing mAbs



MAKE

Produce antibodies



PURIFY

Remove cell debris, virus, etc.



FORMULATE

Final drug product



EX-CELL®
Advanced™
CHO Fed-batch
Medium
**Cell culture media
to enhance cell
growth**



2000L CellReady
bioreactor
**Tank for
cultivating cells**



Clarisolve®
clarification
filters
**Removing cell
debris**



FlexReady®
chromatography
Purifying mAbs



Viresolve® Pro
solution
**Removing viruses
from protein
solutions**



Pellicon®
cassette filters
**Washing and
removing cells,
lipids, particles**



Opticap® capsules
Sterile filtration

Provantage®

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#1 website in research life science industry

Industry leading e-commerce platform and supply chain capability



SEARCH



Hundreds of thousands of products at your fingertips



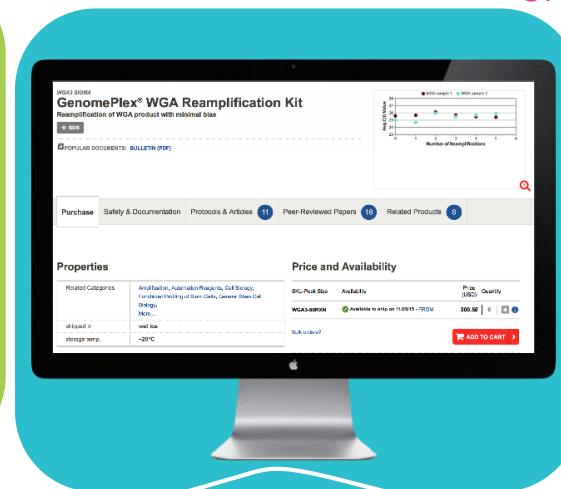
CONTENT



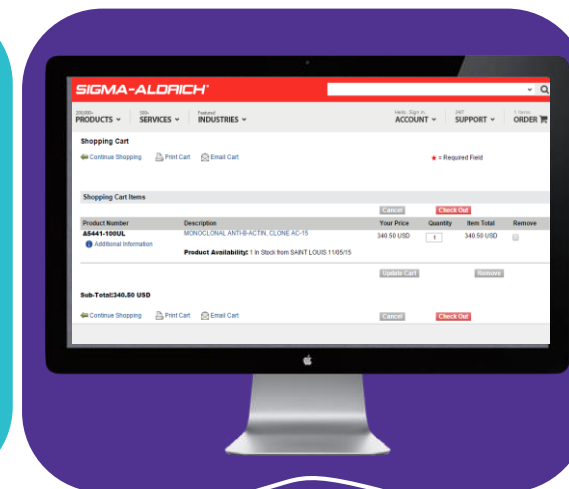
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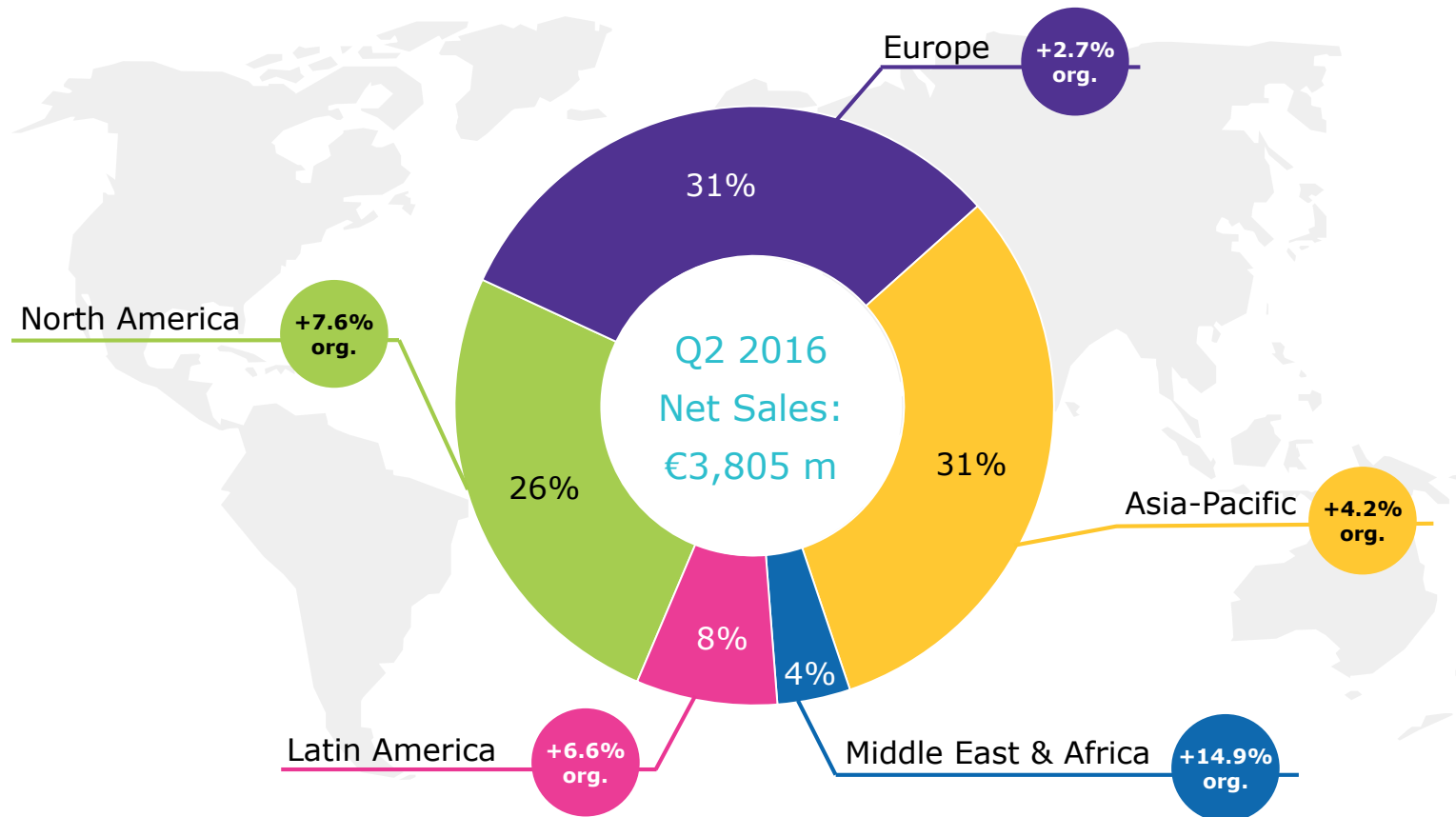


04

FINANCIAL OVERVIEW

Organic growth in all regions

Regional breakdown of net sales [€ m]



Regional development

- Organic growth in Europe driven by robust demand in Process Solutions
- North America benefits from strong Fertility business, Rebif pricing and demand for Process Solutions products
- Asia-Pacific shows solid organic growth driven by Fertility, GM and Life Science partially offset by display destocking
- Solid organic growth in LatAm driven by GM and CH as well as increasing demand for analytical testing (Applied Solutions)

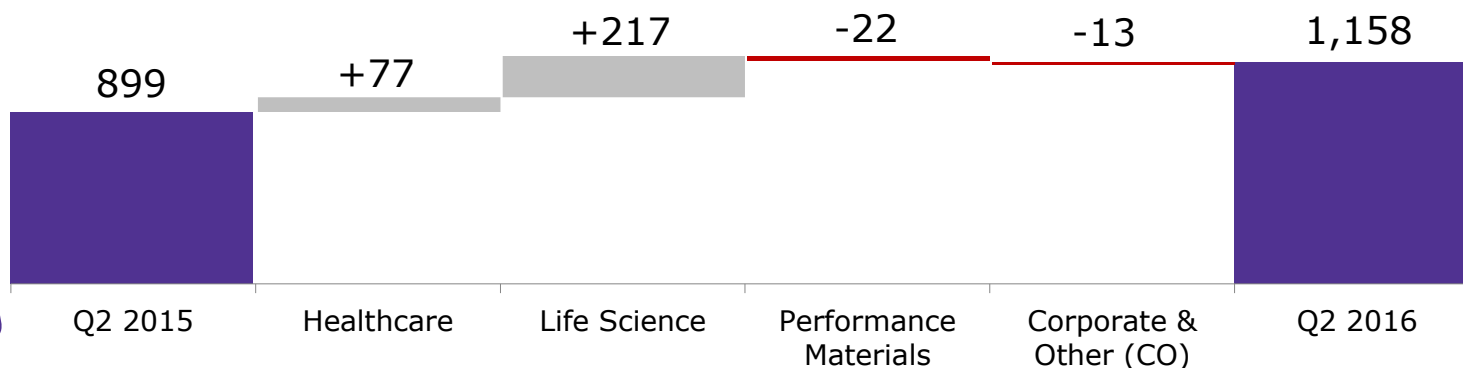
Life Science and Healthcare drive increase in EBITDA pre

Q2 2016 YoY net sales

	Organic	Currency	Portfolio	Total
Healthcare	7.3%	-9.0%	-1.0%	-2.7%
Life Science	8.1%	-2.8%	79.7%	85.0%
Performance Materials	-4.7%	-2.0%	3.1%	-3.5%
Group	5.1%	-6.1%	19.2%	18.2%

- Growth in Healthcare driven by strong Fertility, GM* as well as Xalkori commissions
- Process Solutions continues to drive strong organic growth in Life Science
- Organic decline in Performance Materials reflects display supply chain destocking
- Portfolio is Sigma and Kuvan

Q2 YoY EBITDA pre contributors [€ m]



- HC benefits from strong organic growth, end of Rebif commission expenses and ~€30 m disposal gain
- Life Science driven by Sigma, strong organic growth and synergies
- Performance Materials only slightly lower despite LC sales decline
- CO contains corporate initiatives & hedging

*General Medicine and CardioMetabolic Care
Totals may not add up due to rounding

Q2 2016: Overview

Key figures

[€m]	Q2 2015	Q2 2016	Δ
Net sales	3,219	3,805	18.2%
EBITDA pre	889	1,158	28.8%
Margin (in % of net sales)	27.9%	30.4%	
EPS pre	1.30	1.55	19.2%
Operating cash flow	326	311	-4.7%

[€m]	Dec. 31, 2015	June 30, 2016	Δ
Net financial debt	12,654	12,510	-1.1%
Working capital	3,448	3,813	10.6%
Employees	49,613	50,456	1.7%

Comments

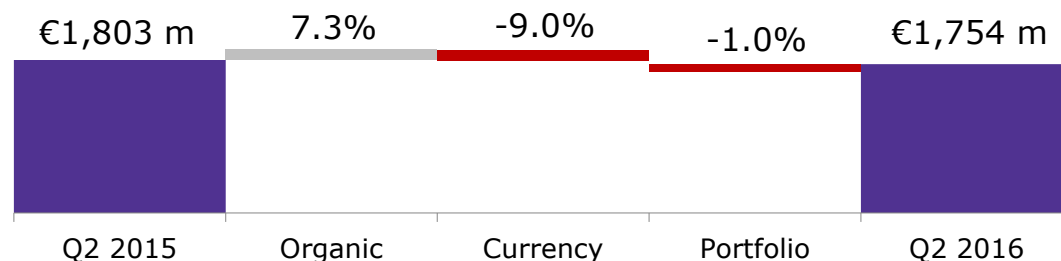
- EBITDA pre & margin increase driven by Sigma, organic performance and end of Rebif commission expenses
- EPS pre up due to EBITDA pre increase, but higher LTIP* charges burden financial result
- Healthy operating cash flow due to strong business performance amid higher tax payments
- Net financial debt reflects operating cash flow and dividend payments
- Working capital shows increase in business activity – further room for improvement

Healthcare: Strong organic growth, EBITDA pre and profitability

Healthcare P&L

[€m]	Q2 2015	Q2 2016
Net sales	1,803	1,754
Marketing and selling	-730	-643
Administration	-69	-66
Research and development	-358	-378
EBIT	267	298
EBITDA	461	558
EBITDA pre	480	557
Margin (in % of net sales)	26.6%	31.8%

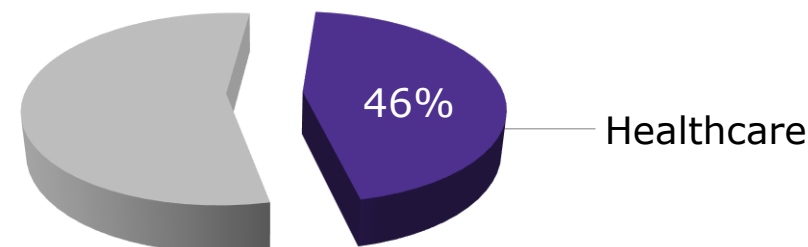
Net sales bridge



Comments

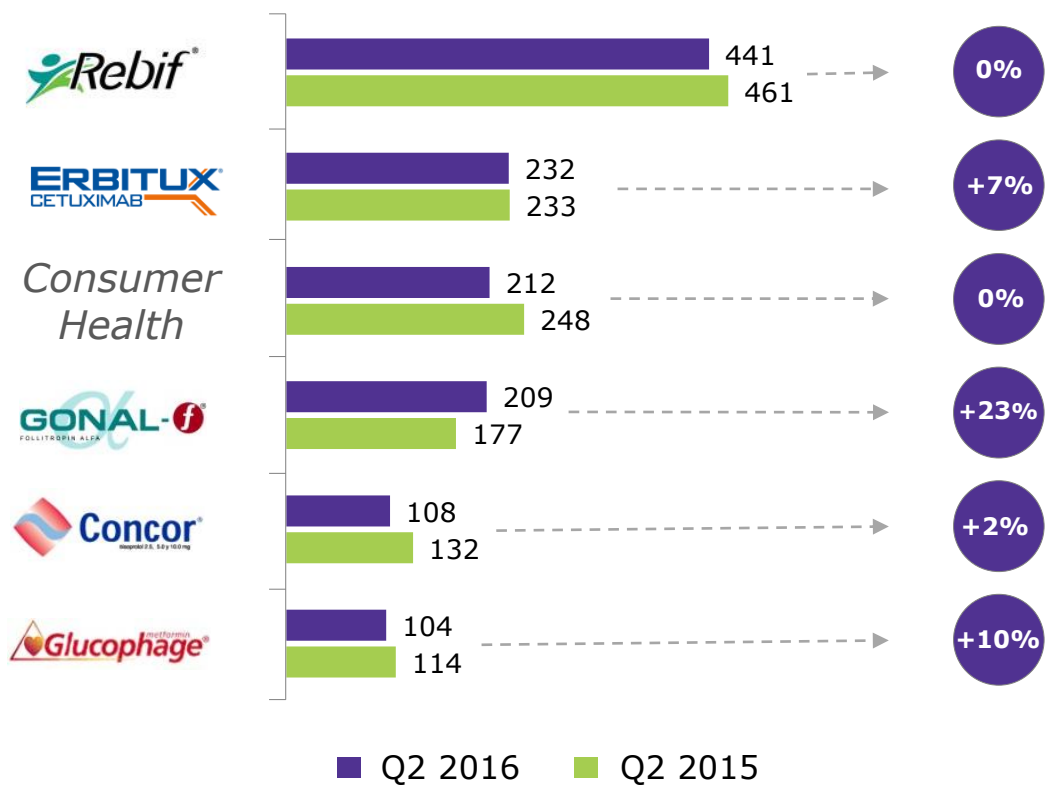
- Rebif organically stable; ramp-up of competition in Europe partially offset by tender in Russia; in U.S. pricing offsets declining volumes
- Solid organic growth of Erbitux across all regions, especially strong volume growth in China, but also low comparables
- Fertility shows strong growth across portfolio especially in China; Gonal-f benefiting from competitive situation in U.S. and low base
- Marketing & selling reflects end of commission expenses for Rebif (U.S.) partially offset by reinvestments in sales force & launch preparations
- R&D spend increases as pipeline development progresses
- Higher EBITDA pre due to strong organic growth, end of Rebif commissions and ~€30 m disposal gain from Merck KGaA, Darmstadt, Germany Ventures minority

Q2 2016 share of group net sales

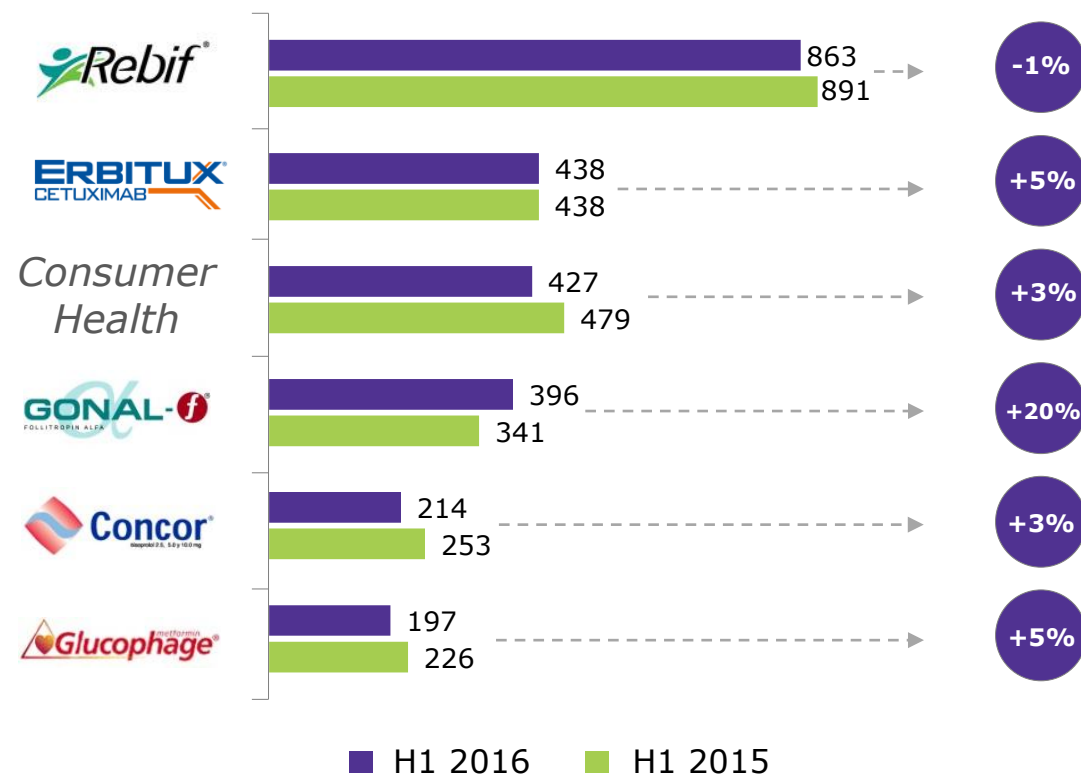


Healthcare organic growth by franchise/product

Q2 2016 organic sales growth [%]
by key product [€ m]

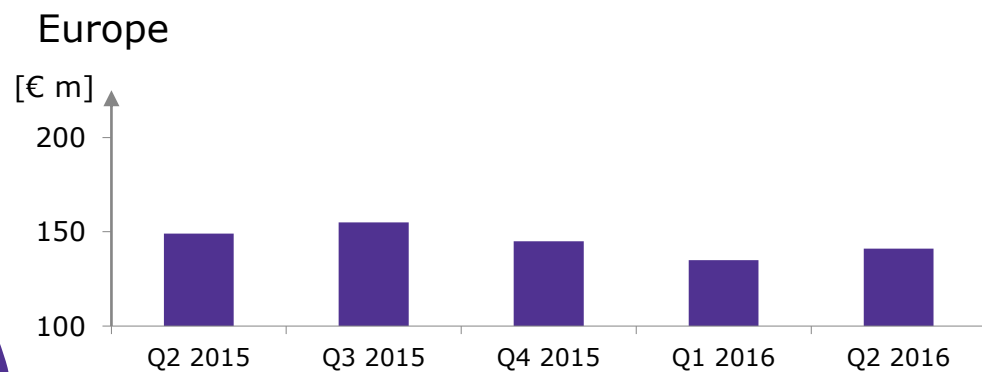
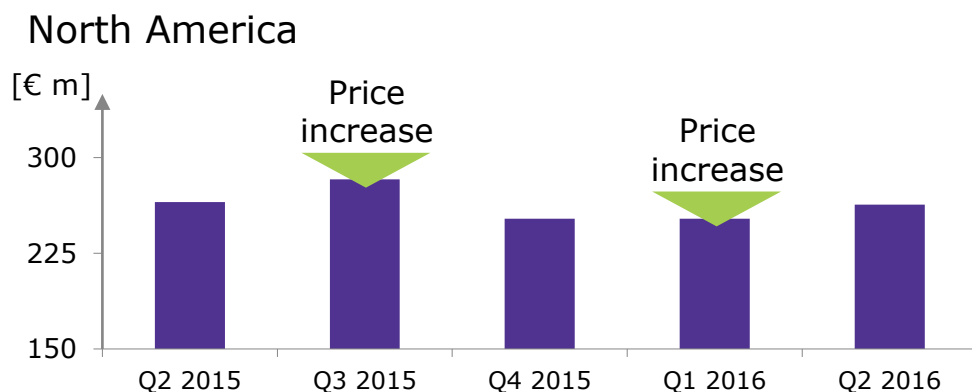


H1 2016 organic sales growth [%]
by key product [€ m]



Rebif: Relief in the U.S. – competitive ramp-up in Europe ongoing

Rebif sales evolution



Q2 drivers
0.0% org.

- Price
- Volume
- FX

Q2 drivers
-2.3% org.

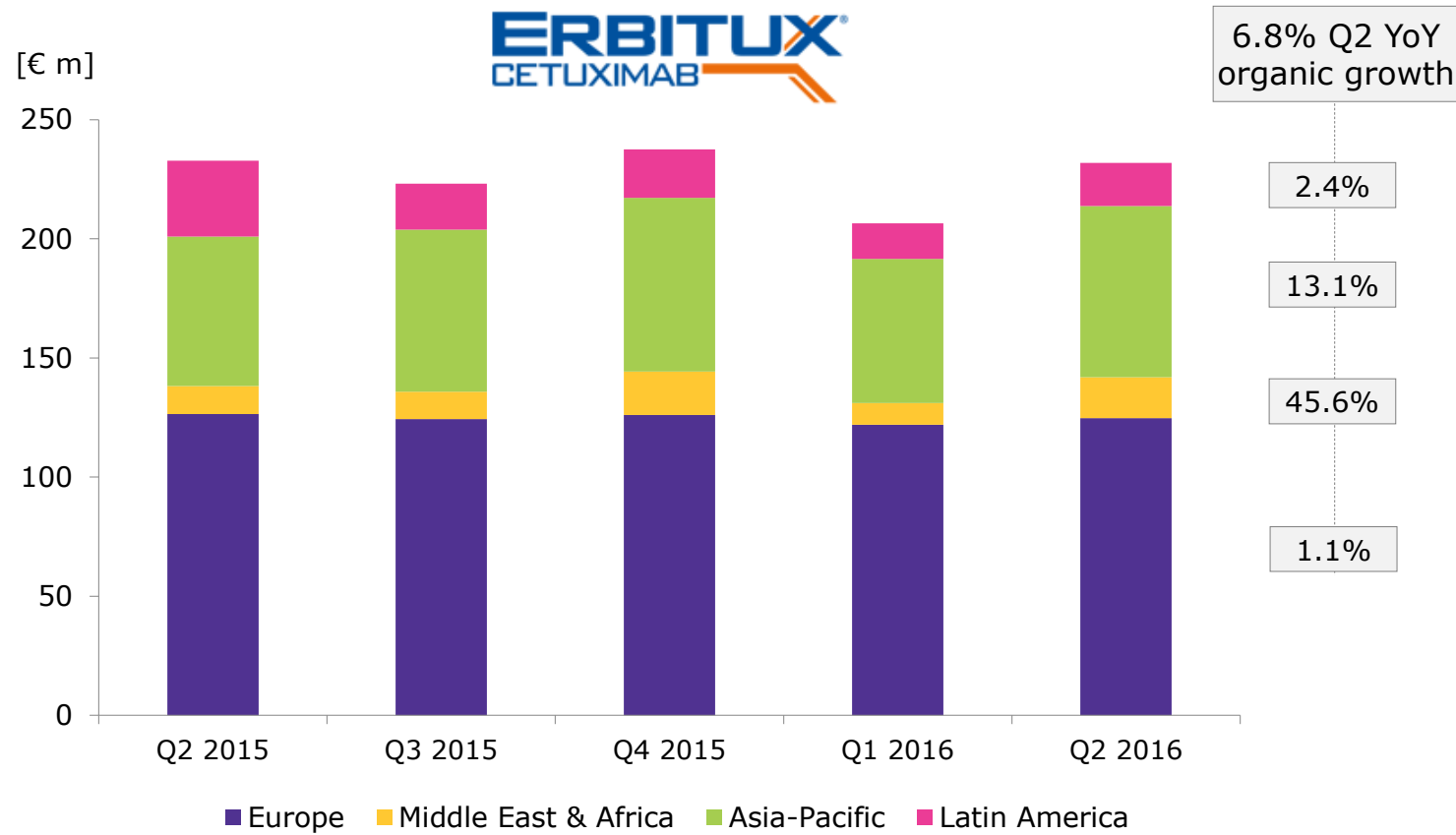
- Price
- Volume

Rebif performance

- Rebif sales of €441 m in Q2 2016 reflect flat organic performance amid negative FX effects from LatAm & EU
- Market shares within interferons stable due to high retention rates and long-term safety track record
- U.S. pricing & market share stabilization offset decline of interferon class
- 5% U.S. price increases in July will support performance going forward
- Phased market entry of orals in Europe causes ongoing volume decline; Q2 2016 contains tender in Russia

Erbitux: A challenging market environment

Erbitux sales by region



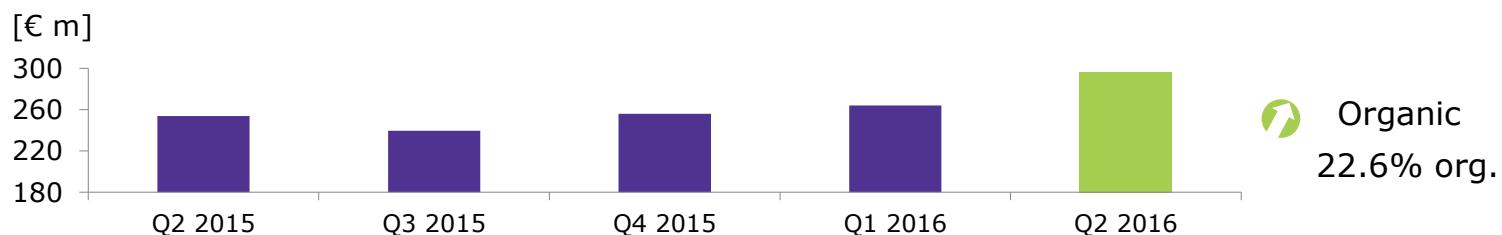
Erbitux performance

- Sales increase to €232 m due to solid volume development especially in growth markets
- Europe stable in ongoing tough environment (price and competition)
- Asia-Pacific shows strong growth led by China
- Organic jump in MEA reflects growing demand but also beneficial tender phasing

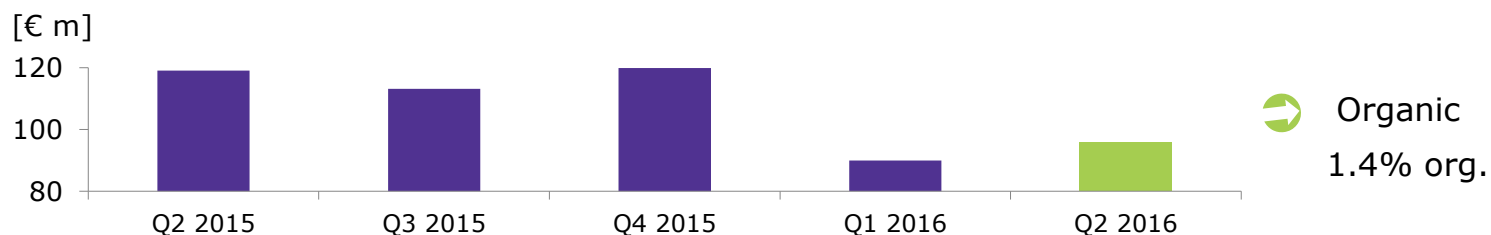
Strong organic growth in Fertility, General Medicine and Endocrinology

Sales evolution

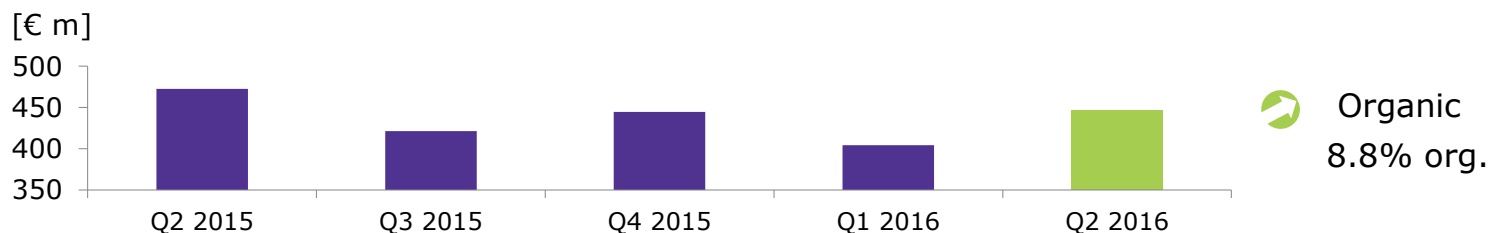
Fertility



Endocrinology



General Medicine*



Q2 drivers

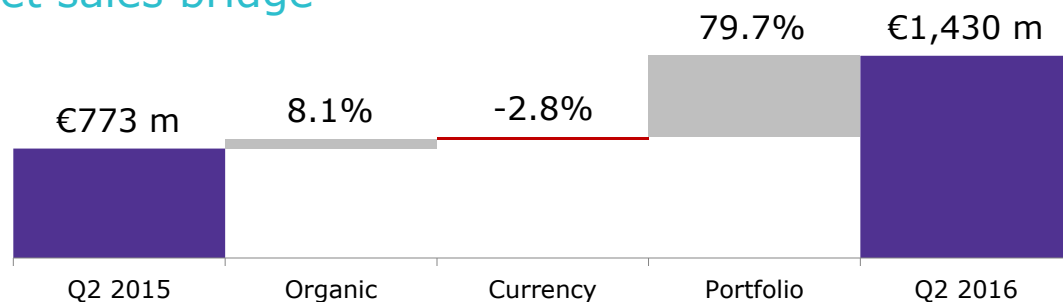
- Gonal-f continues to benefit from competitive situation in U.S. and strong demand in China
- Sales drop in Endocrinology reflects Kuvan divestment; remaining portfolio (Saizen, Serostim) growing organically
- General Medicine sales burdened by FX headwinds from LatAM, organic performance sustainably healthy
- Euthyrox posts strong growth fueled by all regions, China remains key organic contributor of organic growth
- Glucophage growing in all regions especially benefiting from high demand in Middle East

Life Science: Another strong quarter while integration on track

Life Science P&L

[€m]	Q2 2015	Q2 2016
Net sales	773	1,430
Marketing and selling	-244	-413
Administration	-28	-58
Research and development	-49	-65
EBIT	87	166
EBITDA	170	343
EBITDA pre	200	417
Margin (in % of net sales)	25.9%	29.1%

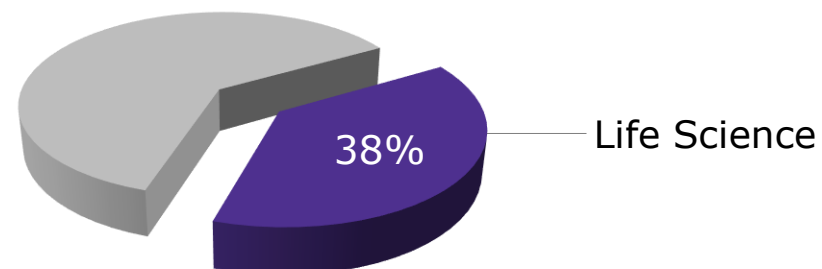
Net sales bridge



Comments

- Double-digit growth of Process Solutions driven by increasing production of large molecules across global and regional accounts
- Applied Solutions shows moderate organic growth, driven by bio-monitoring products for pharma & demand for analytical testing
- Research Solutions benefits from strong demand in Emerging Markets, and for chemical analytics and molecular biology products
- Absolute costs higher due to Sigma, but improve in relation to sales
- Profitability reflects Sigma, business mix and synergies

Q2 2016 share of group net sales

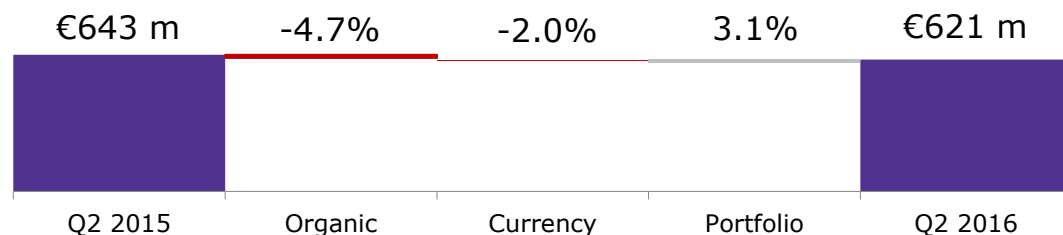


Performance Materials: Strong profitability amid ongoing destocking

Performance Materials P&L

[€m]	Q2 2015	Q2 2016
Net sales	643	621
Marketing and selling	-53	-59
Administration	-14	-14
Research and development	-49	-53
EBIT	238	193
EBITDA	299	267
EBITDA pre	295	273
Margin (in % of net sales)	45.9%	44.1%

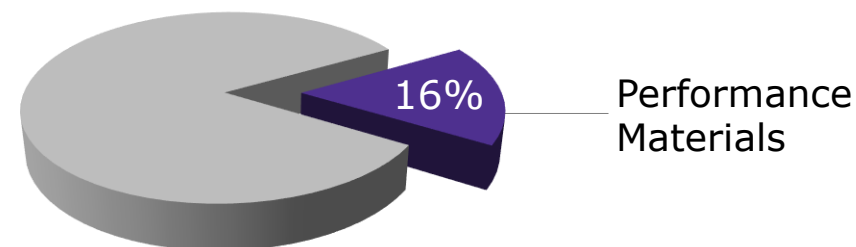
Net sales bridge



Comments

- LC declining as ongoing supply chain destocking & volume declines of mature TN-TFT outweighs volume increase in PS-VA and IPS
- Destocking is expected to continue into H2 2016
- OLED continues to grow on industry capacity expansion & investments
- Integrated Circuit Materials (ICM) shows above market growth mainly driven by dielectric and lithography materials for chip production
- Strong growth of Pigments & Functionals due to strong Xirallic for automotive coatings and cosmetic functionals, but on low comparables
- High profitability reflects leading market position, positive product mix within ICM and Pigments as well as active cost management

Q2 2016 share of group net sales



Reported figures reflect strong business performance

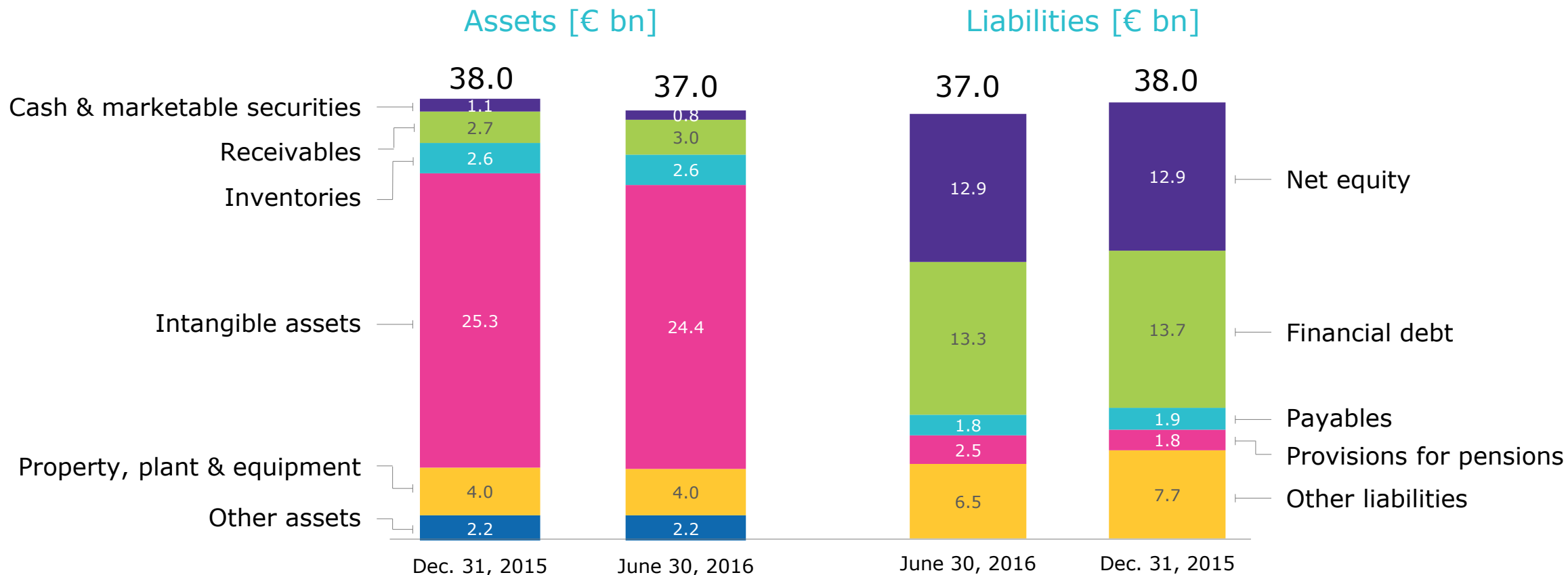
Reported results

[€m]	Q2 2015	Q2 2016	Δ
EBIT	501	550	9.8%
Financial result	-41	-121	>100%
Profit before tax	461	429	-6.8%
Income tax	-115	-115	0.0%
<i>Effective tax rate (%)</i>	24.9%	26.7%	
Net income	343	312	-9.1%
EPS (€)	0.79	0.72	-8.9%

Comments

- EBIT reflects increased EBITDA pre amid integration costs, Sigma D&A and Xalkori impairment (~€70 m)
- Financial result contains Sigma financing interest expenses and significant adverse effects from LTIP
- Effective tax rate slightly above guided range of ~23% to 25% due to Xalkori impairment

Balance sheet – deleveraging in progress after Sigma acquisition

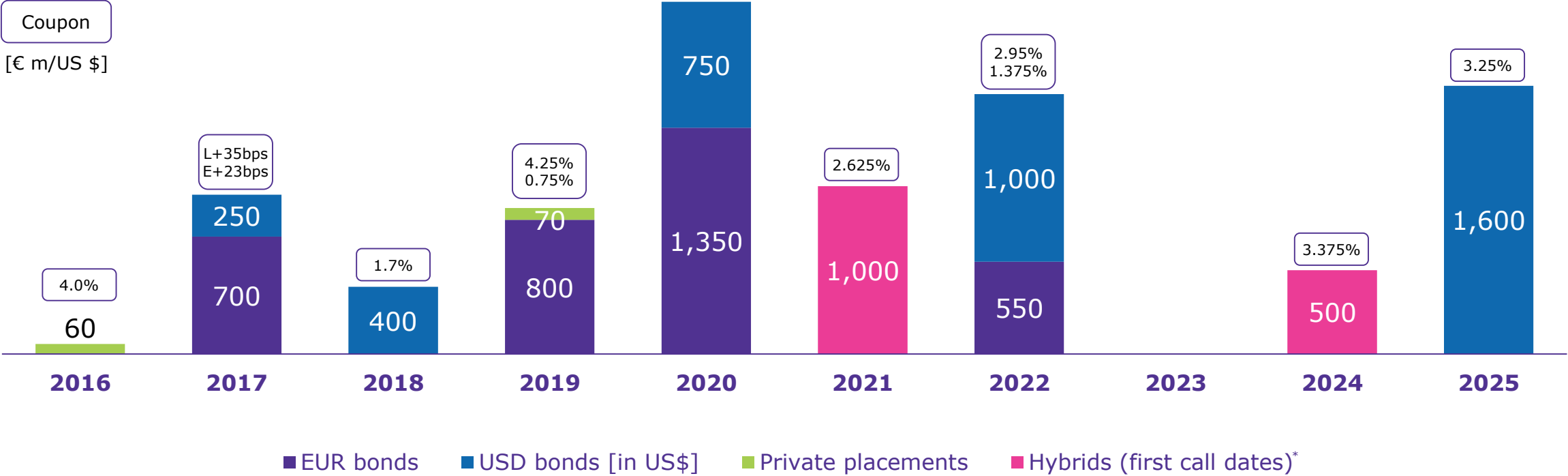


- Total assets decline by 2.6%, equity ratio grows to 34.7%
- Other liabilities decrease by €1.2 bn mainly due to dividend payment to E. Merck KG, Darmstadt, Germany and lower deferred taxes

- Further decline in interest rates increases pension provisions
- Stable net equity: Profit after tax offset by dividends, FX translation and actuarial losses

Well-balanced maturity profile reflects capital market transactions related to Sigma-Aldrich

Maturity profile as of June 30, 2016



Financing structure enables flexible and swift deleveraging

Healthy underlying operating cash flow

Q2 2016 – cash flow statement

[€m]	Q2 2015	Q2 2016	Δ
Profit after tax	346	314	-32
D&A	343	519	176
Changes in provisions	-70	-67	3
Changes in other assets/liabilities	-270	-397	-127
Other operating activities	3	-28	-31
Changes in working capital	-25	-30	-5
Operating cash flow	326	311	-15
Investing cash flow	1,860	-114	-1,974
thereof Capex on PPE	-93	-125	-32
Financing cash flow	-174	-357	-183

Cash flow drivers

- D&A increases due to Sigma and Xalkori impairment
- Higher tax payments burden changes in other assets/liabilities
- Investing cash flow LY contained cash-in from Sigma hedging
- Capex higher due to HQ & Sigma; 2016 peak expected in Q4
- Financing cash flow reflects repayment of Millipore bond and commercial paper

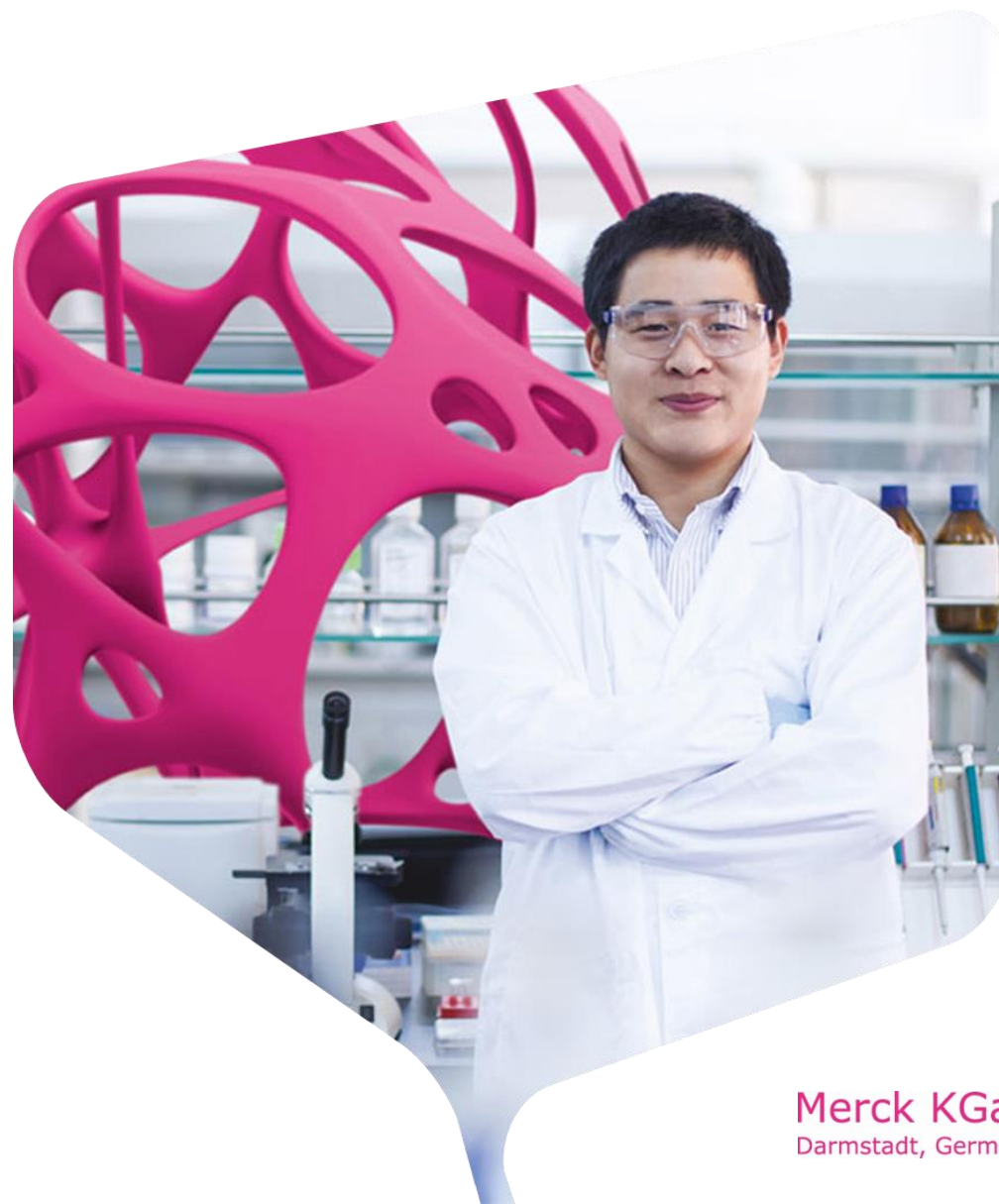
Exceptionals in Q2 2016

Exceptionals in EBIT

[€m]	Q2 2015		Q2 2016	
	Exceptionals	thereof D&A	Exceptionals	thereof D&A
Healthcare	21	2	70	71
Life Science	30	0	74	0
Performance Materials	-3	0	7	0
Corporate & Other	9	0	10	0
Total	56	2	160	71

Financial calendar

Date	Event
October 13, 2016	Capital Market Day - 2016
November 15, 2016	Q3 2016 Earnings release
March 9, 2017	Q4 2016 Earnings release
April 28, 2017	Annual General Meeting
May 18, 2017	Q1 2017 Earnings release



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