



MERCK KGAA, DARMSTADT, GERMANY – Q1 2017 ROADSHOW

Investor Relations

May 2017



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Agenda

- 01 Business overview
- 02 Transforming the company
- 03 Healthcare – Funding for success
- 04 Life Science – Focusing on profitable growth
- 05 Performance Materials – Expanding leadership and innovation
- 06 Executive summary and guidance



01

BUSINESS OVERVIEW

Group

Portfolio of three high-tech businesses



**Leading in specialty
pharma markets**

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



**Leading life science
company**

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

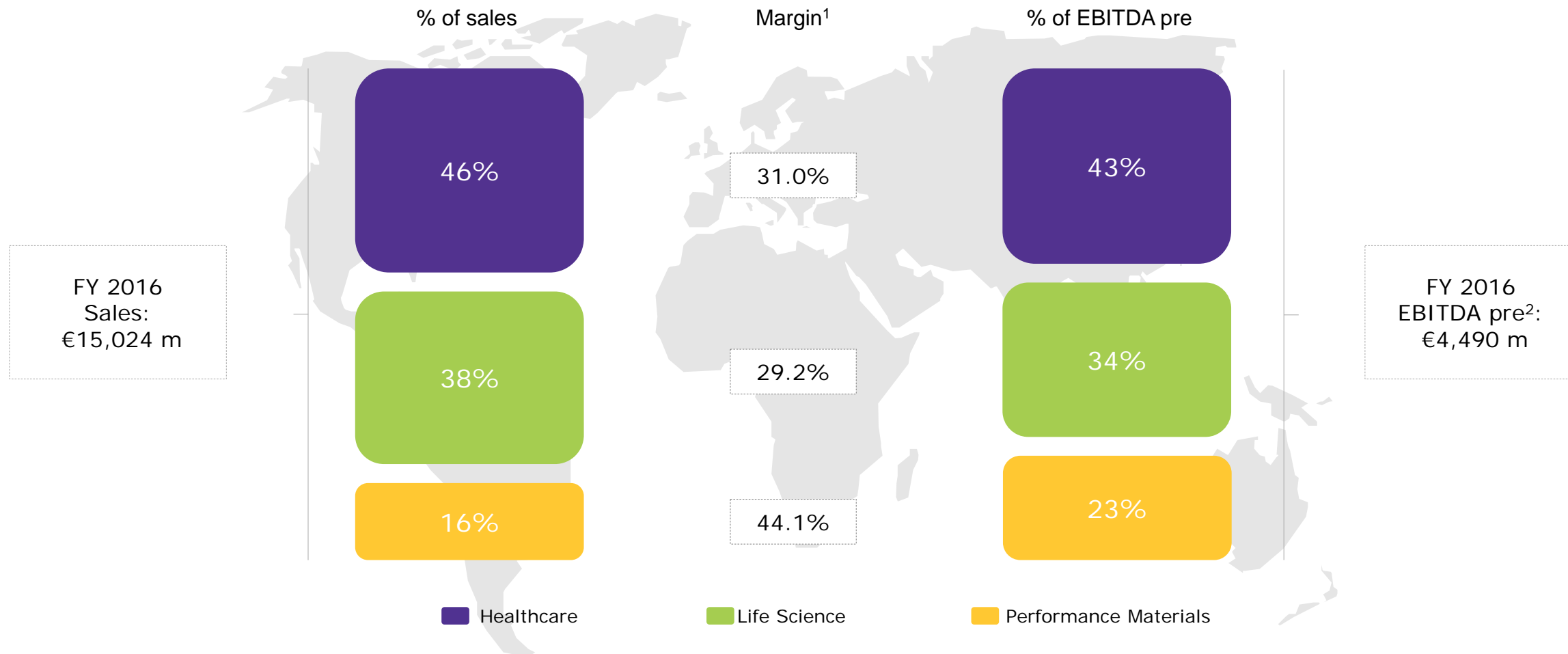


**Market leader in
specialty materials**

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

Group

Strong businesses with attractive margins



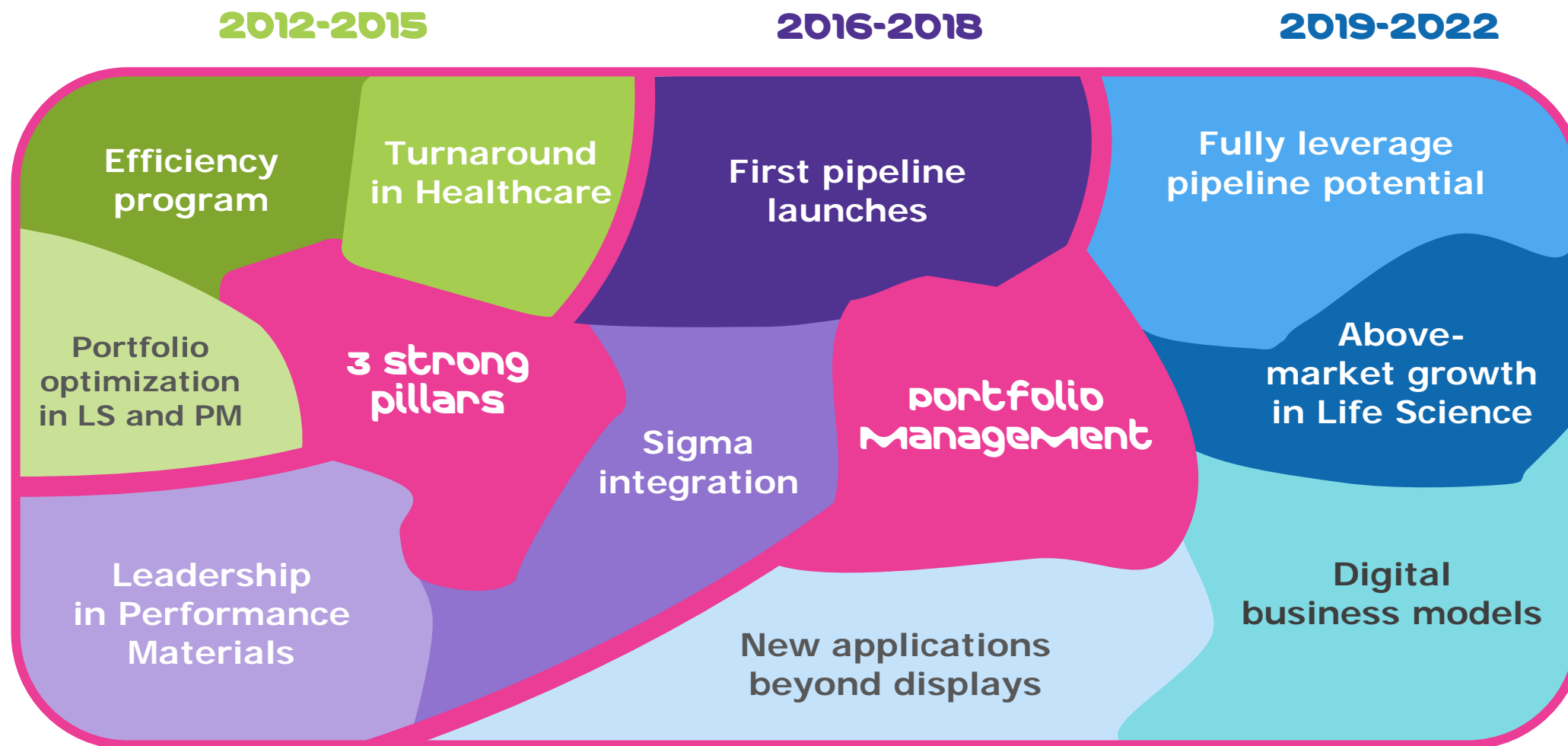
¹EBITDA pre margin in % of net sales; ²Including Corporate/Others (-€396 m)



02

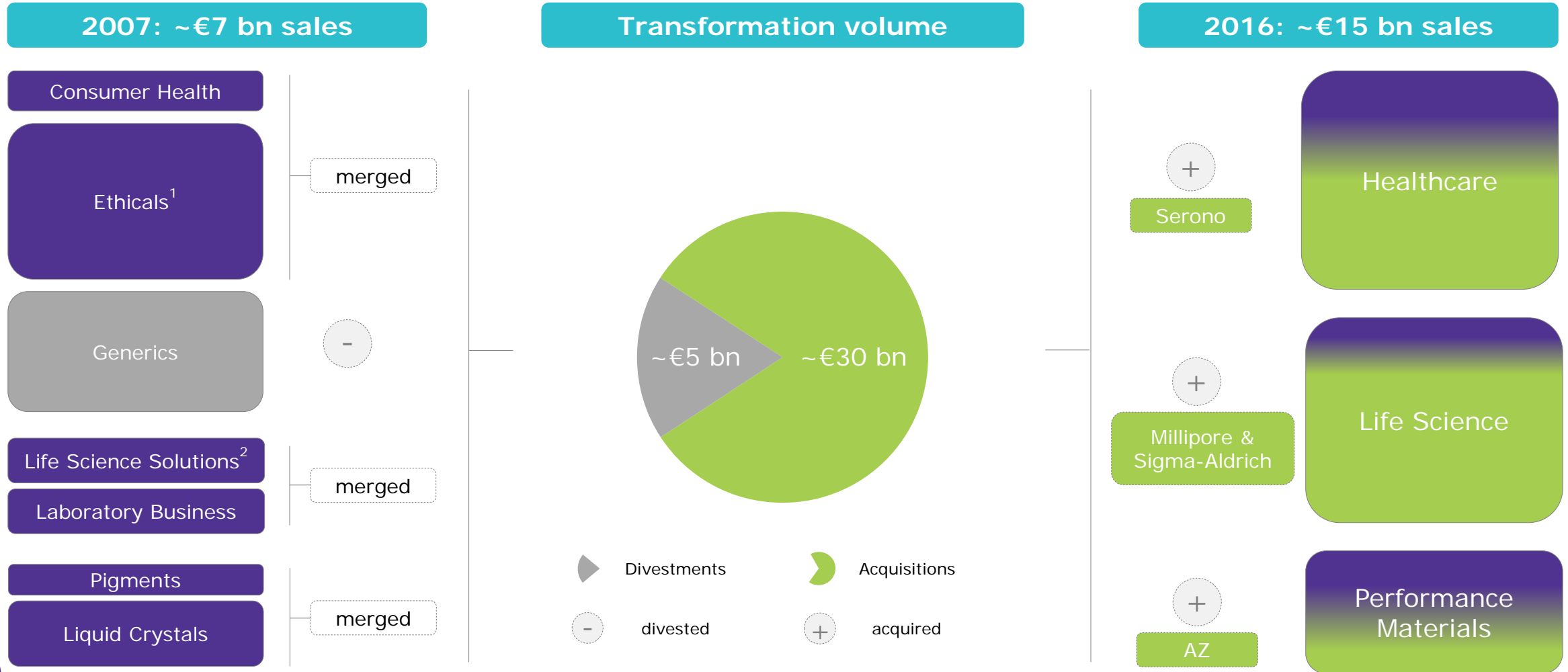
TRANSFORMING THE COMPANY

Group Strategic roadmap 2016-2022



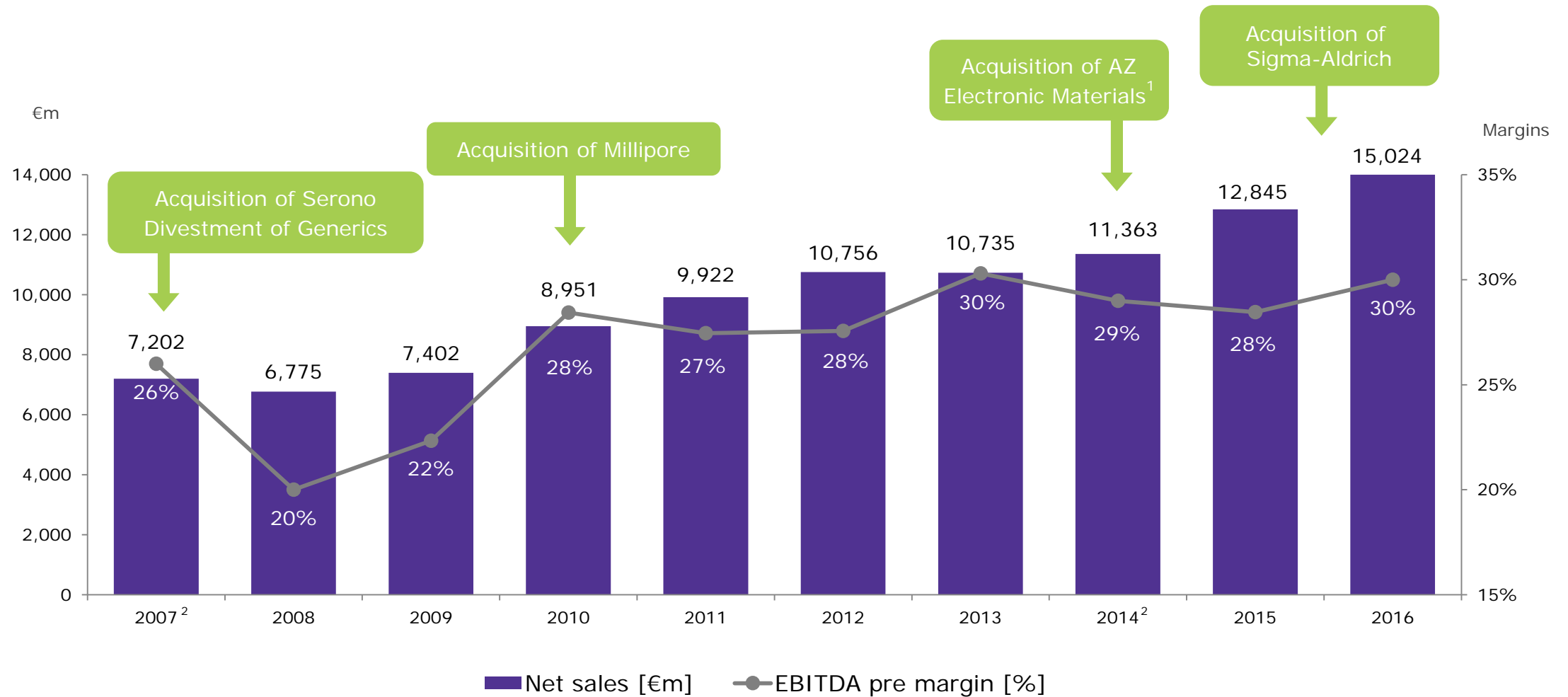
Group

We have added scale and strengthened the attractiveness of our portfolio



Group

Profitability improved fundamentally



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

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. 3 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

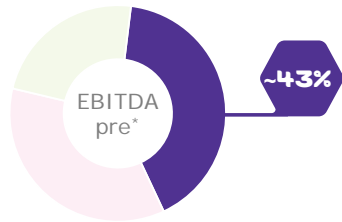
Customer focus

Group

Clear set of priority goals to be realized by 2018



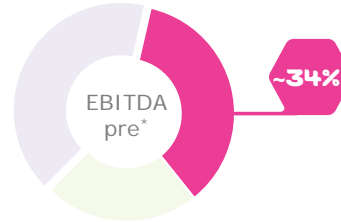
Healthcare



- Maximize growth of existing franchises
- Deliver pipeline: one product launch or indication p.a. from 2017



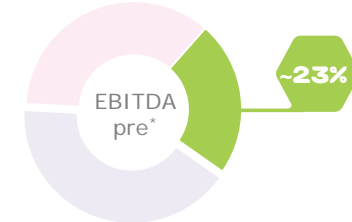
Life science



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



Performance Materials



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

Merck KGaA,
Darmstadt,
Germany

- Deleverage to <2x net debt / EBITDA pre in 2018
- No large acquisitions (>€500 m) for the next 2 years (unless financed by divestments)
- Dividend policy reflects sustainable earnings trend



03

HEALTHCARE – FUNDING FOR SUCCESS

Healthcare

Healthcare is set to deliver on promising pipeline candidates

Deliver
on organic growth

Focus
on pipeline



At least stable existing business



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

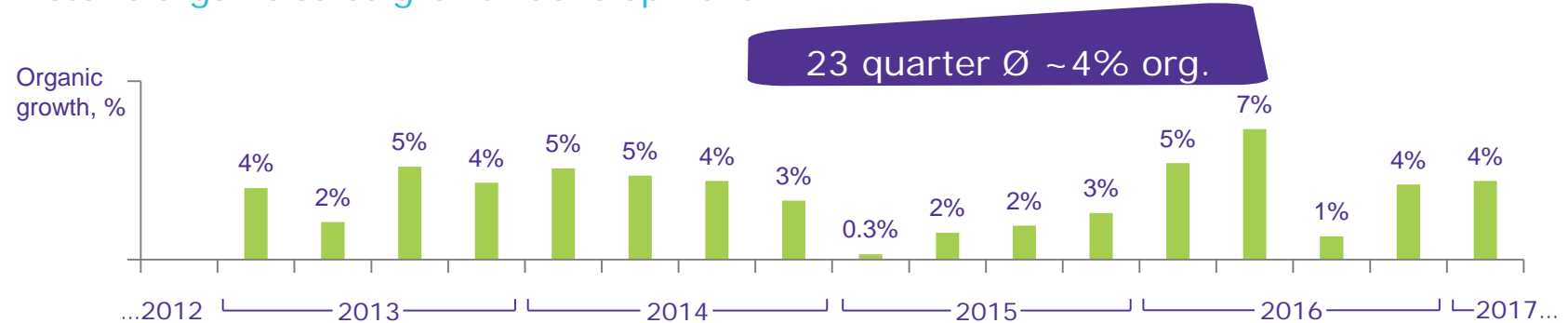


Healthcare

Operational excellence drives healthy growth of existing businesses

Organic growth
for 23
consecutive
quarters

Historic organic sales growth development



Commitment to
at least stable
organic sales
until 2018

Qualitative organic sales growth guidance per product/franchise until 2018

rebif®: Sales decline in line with interferon market

oncology: Stable sales

fertility: Mid single-digit growth

Endocrinology: Low single-digit growth

General Medicine: Mid to high single-digit growth

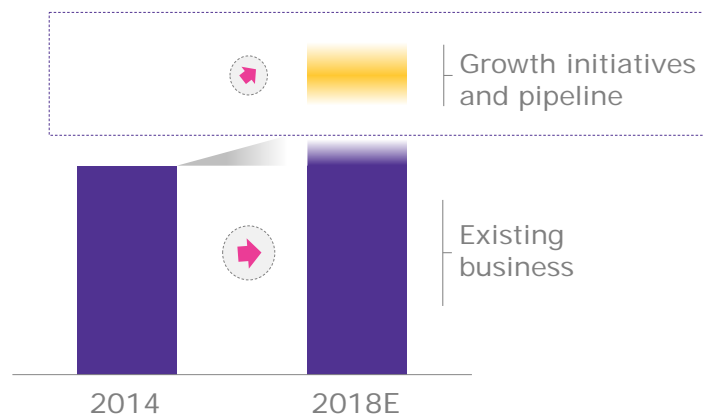
consumer health: Mid single-digit growth

Healthcare

Well on track to deliver the pipeline

Deliver the pipeline

Increase R&D spending



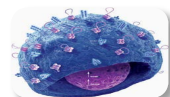
potential pipeline sales



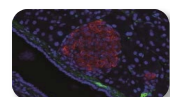
Key investments



Avelumab



BTK – inhibitor



TGF-beta trap

~€150 – 200m higher R&D costs in 2017 vs. 2016

Main moving parts:

- Phase III progress of avelumab
- Dynamics of ramp-up for TGF-beta and BTK-i
- Regular prioritization in view of market dynamics

Healthcare

Increasing R&D productivity with focus on potentially transformative assets

phase I		phase II		phase III	registration
BTK-i (hematological tumors)	Avelumab (mono/combinations)	atacept (SLE)	tepotinib (HCC/NSCLC)	Avelumab (mono/combinations)	Avelumab (MCC)
DNA-PKi / ATRi (solid tumors)	M7824/TGF-b trap (basket trial)	BTK-i (RA, SLE)	Avelumab (MCC 1L)	MSB11022* Biosimilar (chronic plaque psoriasis)	Cladribine-tablets (RRMS)
	NHS-IL 12 (solid tumors)	sprifermin (OA)	BTK-i (RRMS)		
<div></div> Oncology <div></div> Immuno-Oncology		<div></div> Immunology	<div></div> Biosimilars	<div></div> Neurology	

Avelumab

- 30 clinical programs ongoing (>5,200 patients in >15 tumor types)
- Nine phase III trials and various Phase I cohorts ongoing
- For MCC, decision by EMA expected in H2 2017

TGF-b trap

- Enrolling in phase Ib cohorts (>10 indications); >500 patients enrolled
- Interim data expected by mid 2017

BTK inhibitor

- Three immunology phase II trials initiated (RA, SLE, MS)
- One phase I trial in Oncology ongoing (different molecule)

DDR-Program

- Transition of in licensed ATRi and DNA-PKi compounds ongoing
- Analysis of M3814 Phase I data for RT combination expected in H2 2017

Cladribine-tablets

- Decision by EMA expected in Q3 2017

2017 Milestones:

- **Bavencio successfully launched in MCC and mUC in the U.S.**
- **Potential Cladribine-tablets approval**
- **Major trial updates**

Timelines may change: pharma pipeline products are under clinical investigation and there is no guarantee any product will be approved in the sought-after indication
 Acronyms: SLE = Systemic lupus erythematosus; RA = Rheumatoid arthritis; OA = Osteoarthritis; HCC = Hepatocellular cancer; NSCLC = Non-small cell lung cancer
 MCC = Merkel cell carcinoma; UC = Urothelial cancer; RRMS = Relapsing-remitting multiple sclerosis; *On April 24, 2017 Merck KGaA, Darmstadt, Germany announced the divestment of its Biosimilars business to Fresenius. Closing is expected in H2, 2017, subject to regulatory approvals and other conditions



04

**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

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

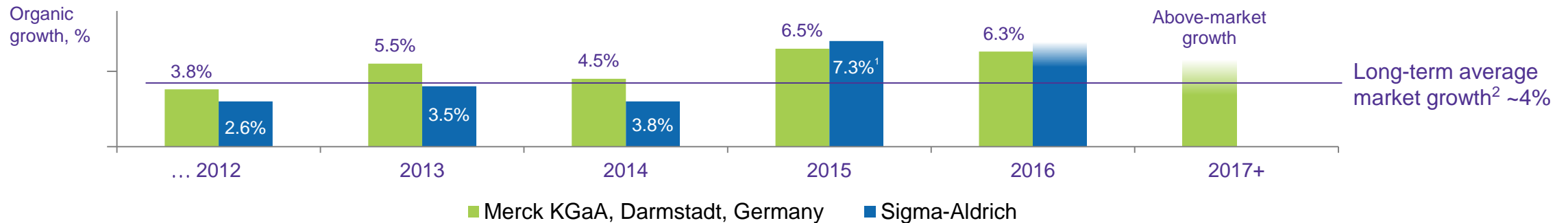
- Outstanding supply chain management (ability to deal with complexity)
- Simple e-commerce platform (customer interface with global coverage)
- Expertise to manage regulatory barriers

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

Life Science

Above-market growth to be enhanced by top-line synergies

Merck KGaA, Darmstadt, Germany and Sigma-Aldrich organic growth rates versus market growth



Sources of market outperformance

1

Portfolio composition

- Exposure to biopharma
- Highest share of consumables
- Broad product offering

2

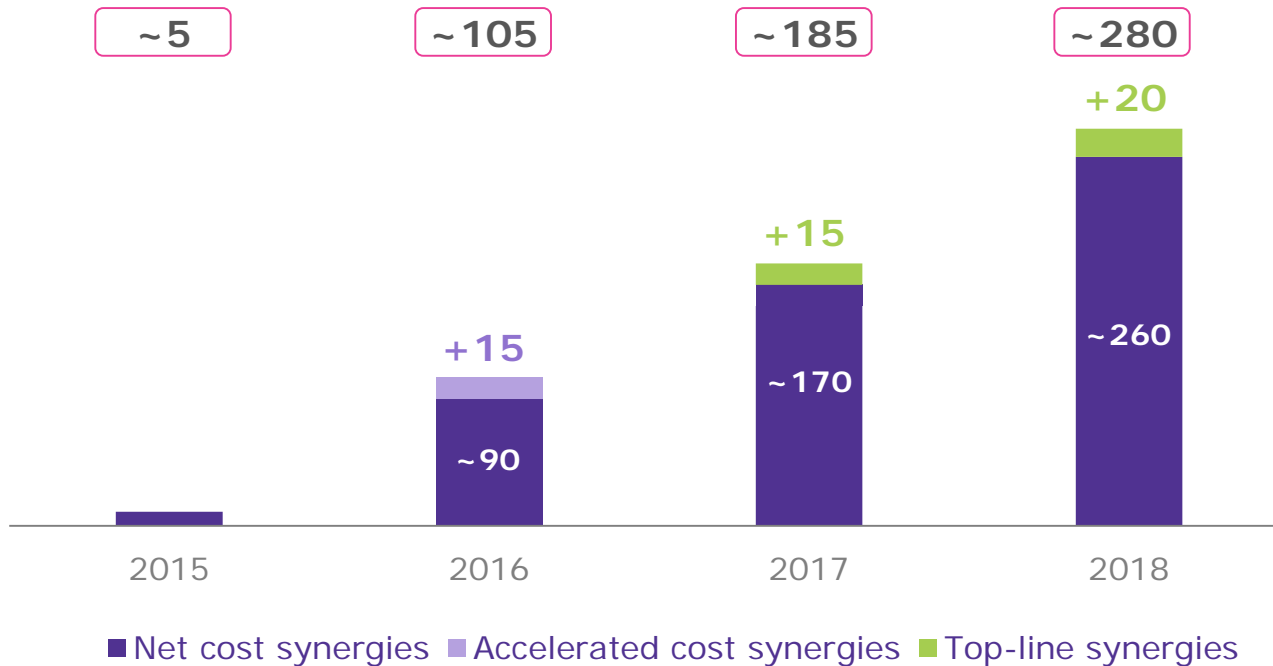
Top-line synergies

- Best in class eCommerce
- Excellent service capabilities
- Global reach

Life Science

Synergy upgrade driven by fast 2016 execution and top-line synergies

EBITDA pre impact of synergy ramp-up [€m]



Synergy upgrade of ~10% confirms strong integration capabilities

Sources

Cost synergy status (for 2016)

- **faster** implementation of synergy measures in all areas
- **2016** total cost synergies of **~€105 M**
- Integration costs remain unchanged at ~€400 m

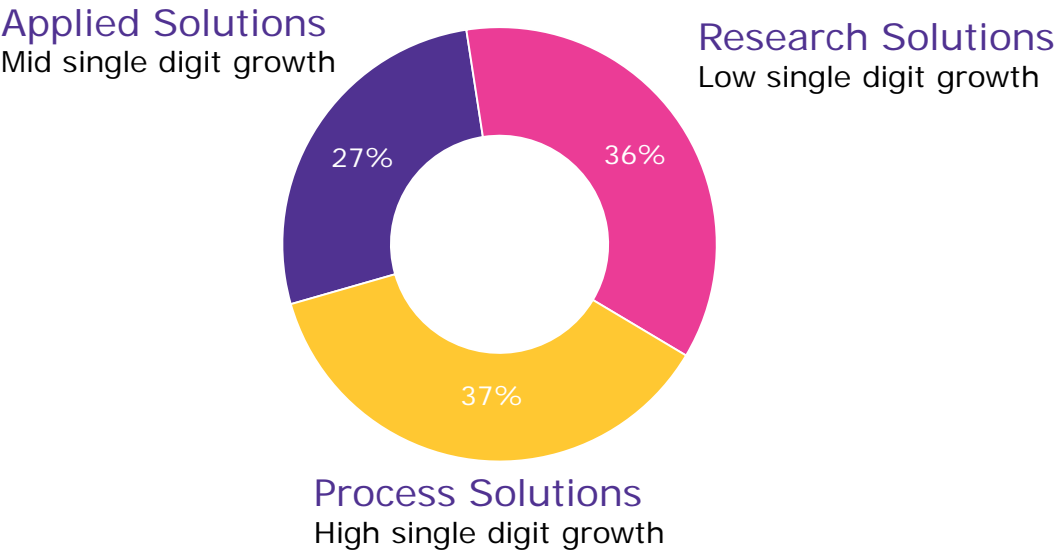
Top-line synergies (from 2017)

- Strong eCommerce and **IT capabilities** applied to existing products
- Extensive **portfolio** and **customer** complementarity in Process and Applied Solutions
- Leverage **regional** Merck KGaA, Darmstadt, Germany - Asia and Sigma - North America footprint
- Expecting **~50-100 bps** in additional **sales growth** with average EBITDA pre margin

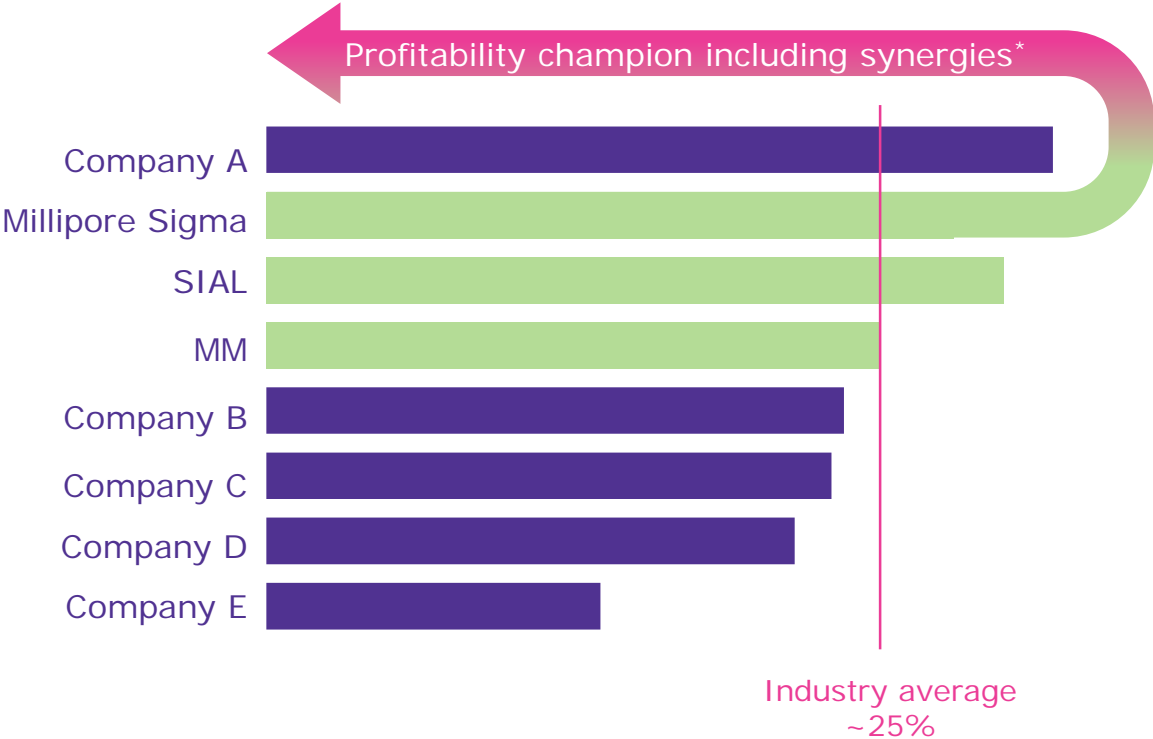
Life Science

We aim to be the profitability champion of the sector

Sales breakdown as of FY 2016



Above industry margin levels



Life Science is well set for sustainable growth and profitability





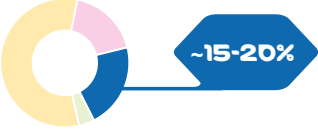









05

**PERFORMANCE
MATERIALS –
EXPANDING LEADERSHIP
AND INNOVATION**

Performance Materials

The four pillars are set for future profitable growth

Business unit	% sales	Products	Mid-term growth trend
 Display Materials	 ~50-55%	<ul style="list-style-type: none"> Liquid crystals (LC) and photoresists for TVs, smartphones and tablet computers Other display and non-display applications (e.g. LC Windows) 	
 Integrated Circuit Materials	 ~15-20%	<ul style="list-style-type: none"> Dielectrics, colloidal silica, lithography materials, yield enhancers, edge-bead removers Polyimide raw materials and printing materials 	
 Pigments and Functional Materials	 ~15-20%	<ul style="list-style-type: none"> Effect pigments and functional materials for coatings, plastics, printing and cosmetics Functional materials for cosmetics & special applications 	
 Advanced Technologies	 ~5-10%	<ul style="list-style-type: none"> Organic and inorganic light emitting diodes Functional materials for electronics and energy solutions 	

Well-founded medium-term low to mid single-digit growth profile

Four-pillar strategy and innovation power strengthen our earnings profile

Ongoing innovation

Launch of innovative products and new business models continues

Four strong pillars

Combination of four highly profitable businesses raises diversification

Market leadership

Strong market position is based on innovation power and differentiation



1 Superior profitability

2 Strong earnings resilience

3 Low to mid single-digit mid-term growth

Performance Materials

Sound platform to deliver high earnings

1 Four-pillar platform diversifies earnings stream

- Liquid Crystals remain key earnings contributor
- Integrated Circuit business growing ahead of market
- Pigments continue to grow with high-end products
- OLED is becoming a visible growth driver

2 Continuous innovation as key profitability driver

- New products contribute to growth and profitability
- Liquid crystal technology mode UB-FFS and upcoming SA-VA are the most recent examples

Balanced sales and consistently high earnings



We are the innovation leader



Diversification of portfolio and ongoing innovation lead to solid growth trajectory

*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

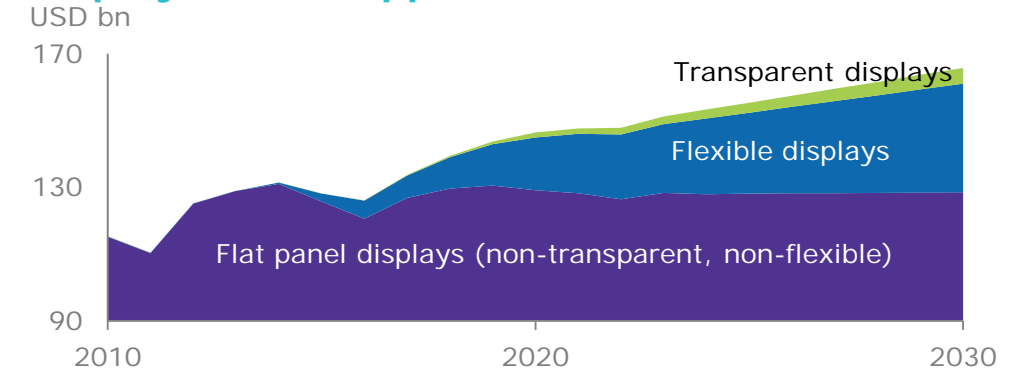
Performance Materials

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, esp. in China

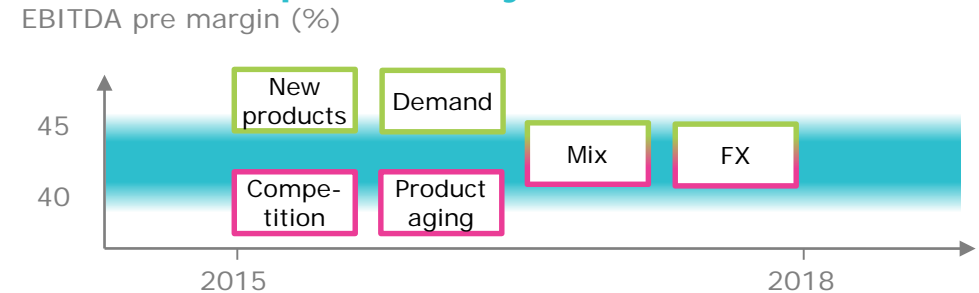
Display market opportunities continue to evolve



4 High value-added products yield superior profitability

- High market share in all relevant products
- Differentiation via innovation still possible
- Customer intimacy further supports uniqueness

Sustainable profitability drivers



Unique differentiation and market position will continue to lead to strong profitability



06

EXECUTIVE SUMMARY AND GUIDANCE

Group

We are well on track to deliver on our promises



Group

Net debt reduced by ~€1.4 bn¹
Strict financial discipline supports rating



Healthcare

Base business growing
2 avelumab indications launched



Life Science

Sigma-Aldrich synergies raised and well on track
Organic growth above market



Performance Materials

Introduce new technologies
Volatility well managed

**Important
Milestones
reached
to deliver
on our
promises**

**CMD²
December
2015**

**Q1 2017
Results**

2018

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

Full-year 2017 guidance

▶ Net sales: ~ €15.5 – 16.0 bn ◀

▶ EBITDA pre: ~ €4,400 – 4,600 m ◀

▶ EPS pre: ~ €6.15 – 6.50 ◀





Appendix

01 Guidance details

02 Healthcare

03 Life Science

04 Performance Materials

05 Financial details



01

GUIDANCE DETAILS

2017 business sector guidance



Healthcare

Net sales

- Slight organic growth
- Ongoing organic Rebif decline
- Other franchises growing; repatriation of Glucophage/China supportive

EBITDA pre

~ €1,900 – 2,000m



Life Science

Net sales

- Organic growth slightly above market, driven by Process Solutions
- First minor contribution of top-line synergies

EBITDA pre

~ €1,780 – 1,850m



Performance Materials

Net sales

- Slight organic decline
- Volume increases in all businesses
- Further market share normalization in Liquid Crystals

EBITDA pre

~ €1,050 – 1,130m

Additional financial guidance 2017

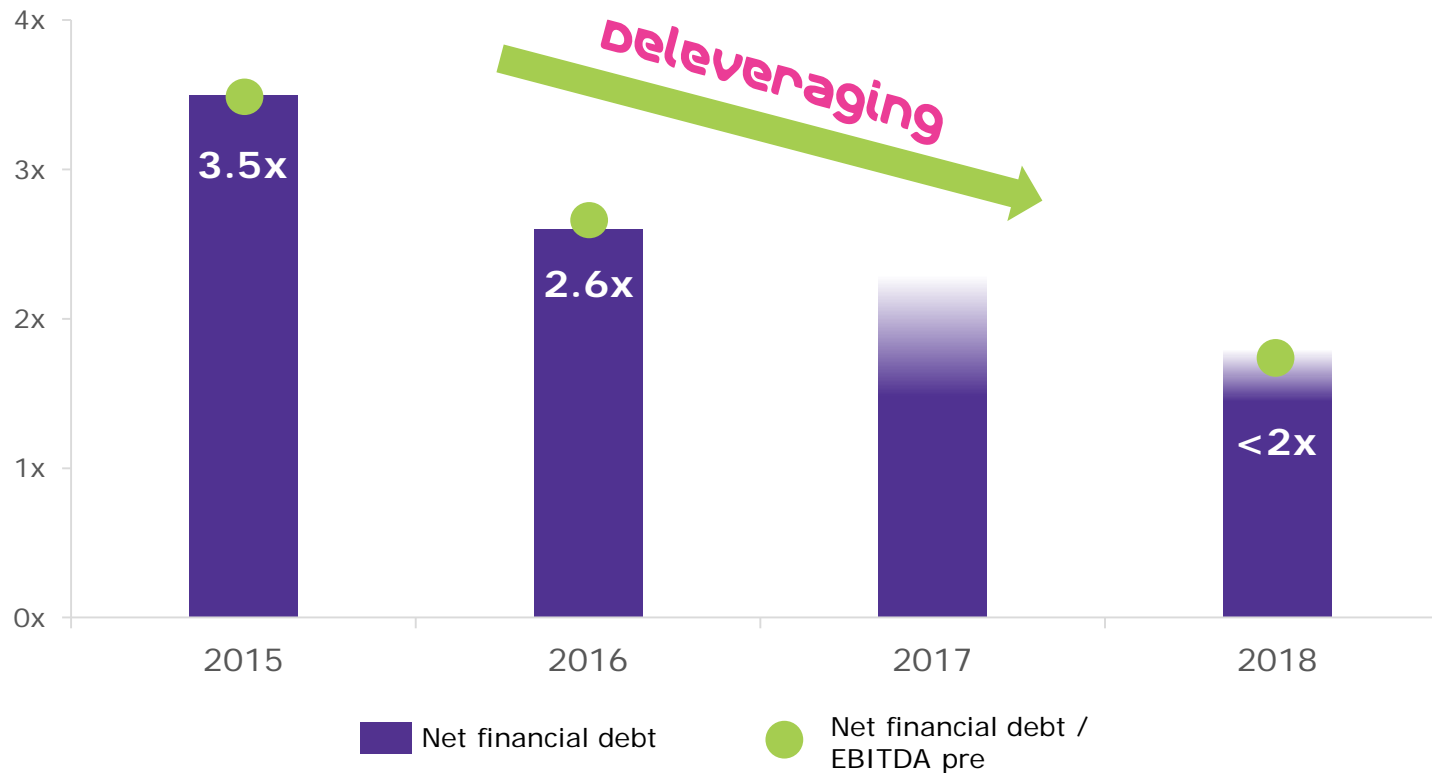
Further financial details

Corporate & Other EBITDA pre	~ -€350 – -400m
Interest result	~ -€250 – -260 m
Effective tax rate	~ 23% to 25%
Capex on PPE	~ €850 – 900 m
Hedging/USD assumption	2017 hedge ratio ~60% at EUR/USD ~ 1.11 to 1.12
2017 Ø EUR/USD assumption	~ 1.06 – 1.10

Strong focus on cash generation to ensure swift deleveraging

Net financial debt* and leverage development

[Net financial debt/
EBITDA pre]



Focus on deleveraging

- Commitment to swift deleveraging to ensure a strong investment grade credit 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)

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



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



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



Sales

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

Costs

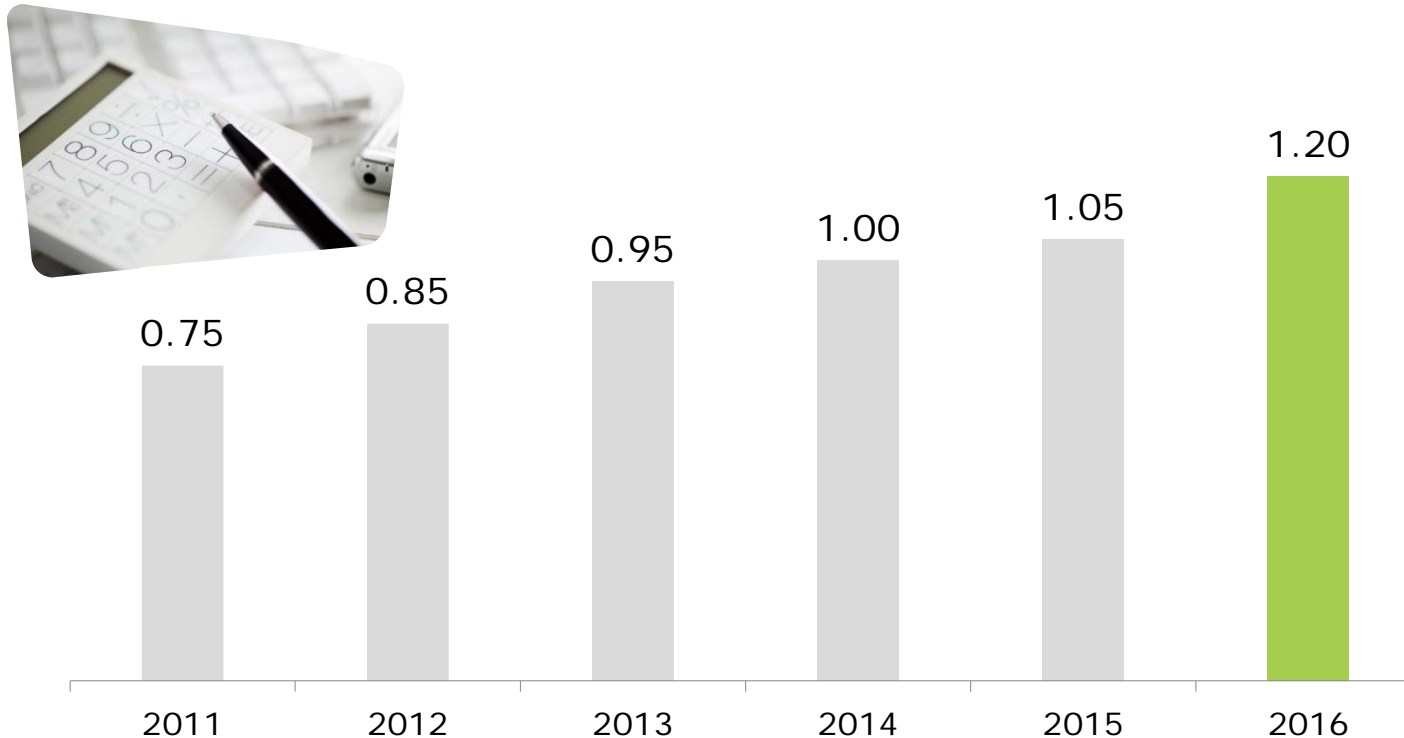
- Main production sites in Germany
- Several R&D and mixing facilities in Asia

FX Impact



Sustainable dividend development

Dividend¹ development 2011-2016

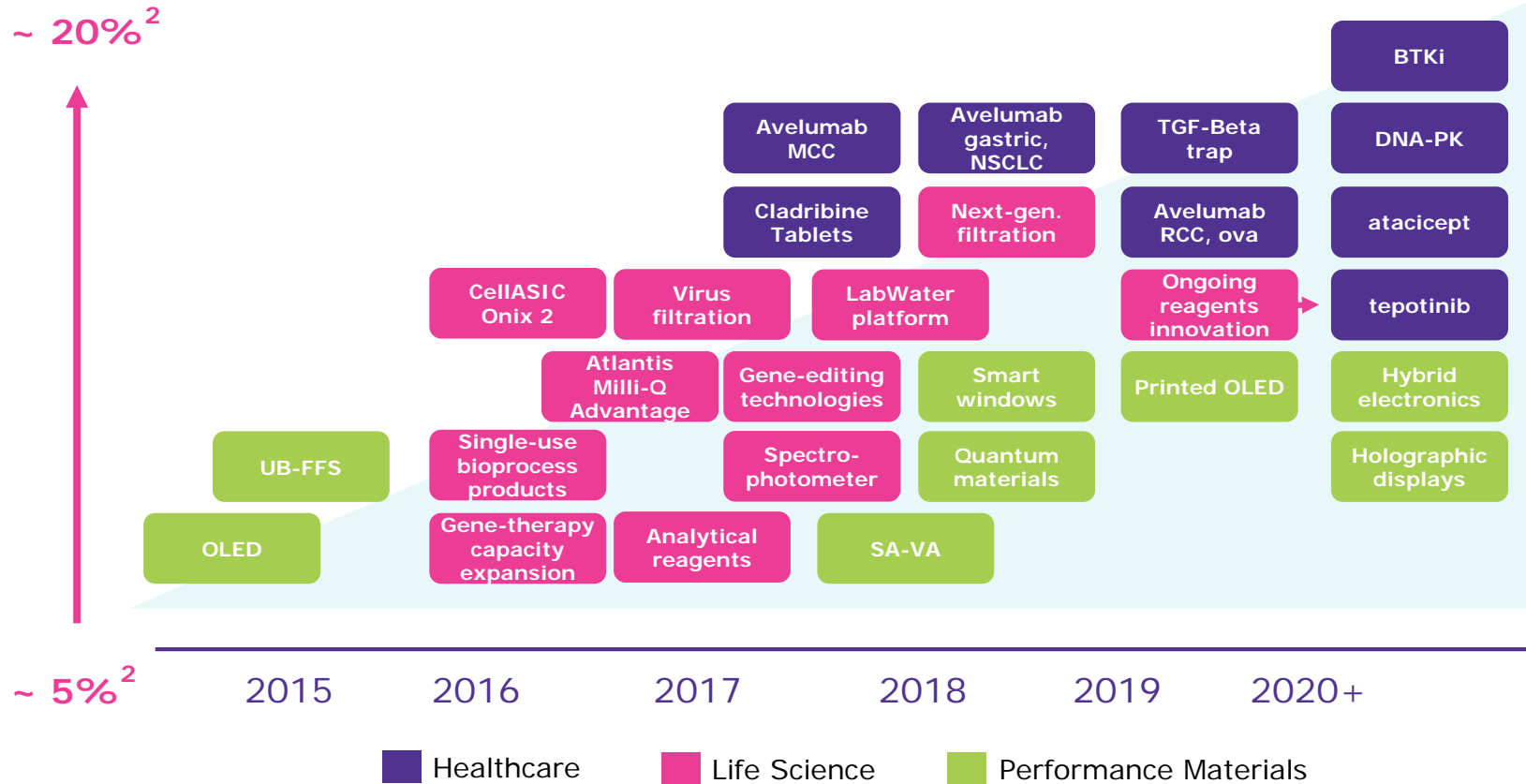


2016 dividend

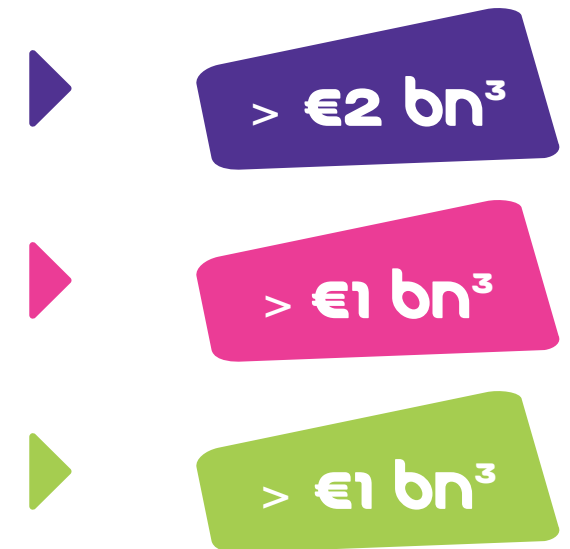
- Dividend of €1.20 per share for 2016, reflecting 19.3% of EPS pre
- Dividend development in line with business performance and earnings progression
- Dividend yield² of 1.21%

Our strong innovation capabilities will drive growth

New product launch cadence¹ by business sector



New product sales³ potential 2022



Our rich pipeline will strongly drive sales

¹Illustration: timelines may change as product introductions are subject to customer adoption and implementation; pharma pipeline products are under clinical investigation and there is no guarantee any product will be approved in the sought-after indication; ²Share of total Group net sales from new products launched over the past 5 years, risk-adjusted; ³risk-adjusted



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



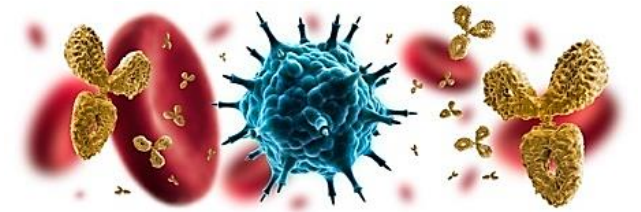
Biologicals portfolio



- 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 Healthcare's existing franchises is clear

	Continue to drive mCRC* share by increasing patient testing and expanding head and neck coverage
	Ongoing 3x3 growth strategy implementation to strengthen sales and marketing activities delivering above-market organic sales growth
	Capitalize on strong efficacy and new smart devices to maximize differentiation and defend franchise
	Build on No.1 position and ART* 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 lifecycle management and expand business including asset repatriation



Clinical pipeline

Phase I

M2698 – p70S6K & Akt inhibitor
Solid tumors

M3814 – DNA-PK inhibitor
Solid tumors

M9831 (VX-984) – DNA-PK inhibitor
Solid tumors

M6620⁷ (VX-970) – ATR inhibitor
Solid tumors

M4344 (VX-803) – ATR inhibitor
Solid tumors

M7583 – BTK inhibitor
Hematological malignancies

Avelumab – Anti-PD-L1 mAb
Solid tumors

Avelumab – Anti-PD-L1 mAb
Hematological malignancies

**M9241 (NHS-IL12)
Cancer immunotherapy**
Solid tumors

M7824 - anti-PD-L1/TGF-beta trap
Solid tumors

**M1095⁹ (ALX-0761)
Anti-IL-17 A/F nanobody**
Psoriasis

Phase II

**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 1L¹

**Sprifermin
Fibroblast growth factor 18**
Osteoarthritis

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

**Atacicept
Anti-Blys/anti-APRIL fusion protein**
IgA nephropathy

**Evobrutinib
BTK inhibitor**
Rheumatoid arthritis

**Evobrutinib
BTK inhibitor**
Systemic lupus erythematosus

**Abituzumab
anti-CD 51 mAb**
Systemic sclerosis with interstitial lung disease

**Evobrutinib
BTK inhibitor**
Multiple sclerosis

Phase III

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

Avelumab – Anti-PD-L1 mAb
Non-small cell lung cancer 2L²

Avelumab – Anti-PD-L1 mAb
Gastric cancer 1L^{1M}

Avelumab – Anti-PD-L1 mAb
Gastric cancer 3L³

Avelumab – Anti-PD-L1 mAb
Urothelial cancer 1L^{1M}

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

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

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

Avelumab - Anti-PD-L1 mAb
Locally advanced head and neck cancer

**MSB11022⁸
Proposed biosimilar of Adalimumab**
Chronic plaque psoriasis

Registration

**Cladribine⁴ Tablets –
Lymphocyte targeting agent**
Relapsing-remitting multiple sclerosis

Avelumab⁵ – Anti-PD-L1 mAb
Merkel cell carcinoma

Recently registered

Avelumab⁵ – Anti-PD-L1 mAb
Merkel cell carcinoma

Avelumab⁶ – Anti-PD-L1 mAb
Urothelial cancer 2L²

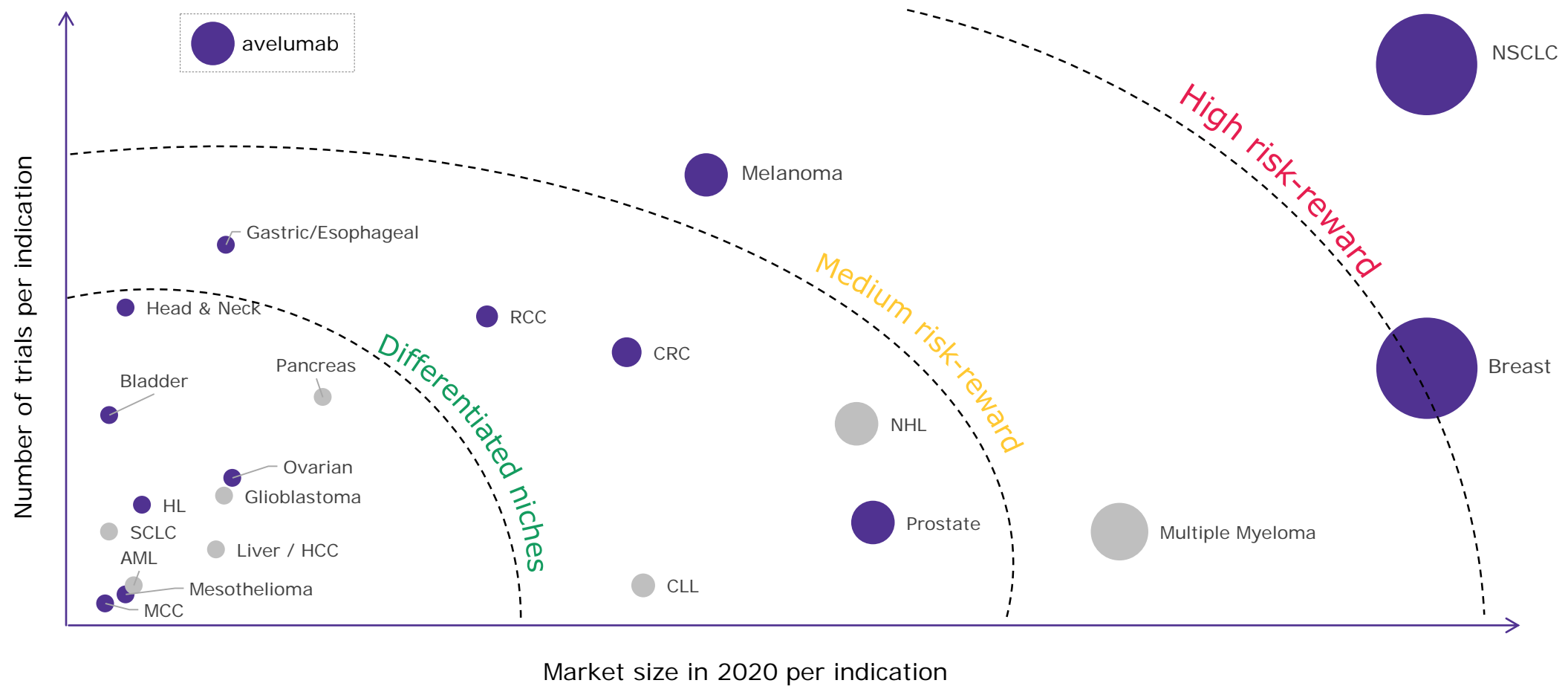
- Neurology
- Oncology
- Immunology
- Immuno-Oncology
- Biosimilars

Pipeline as of May 11th, 2017

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.

¹ 1st line treatment; ^{1M} First Line maintenance treatment; ² 2nd line treatment; ³ 3rd line treatment; ⁴ European Medicines Agency (EMA) accepted Marketing Authorization Application (MAA) from Merck KGaA, Darmstadt, Germany in July 2016; ⁵ EMA accepted MMA from Merck KGaA, Darmstadt, Germany in July 2016 and on March 23, 2017, the US FDA has approved avelumab for the treatment of adults and pediatric patients 12 years and older; ⁶ On May 9, 2017 the US FDA approved avelumab for the treatment of patients with locally advanced or metastatic urothelial carcinoma who have disease progression during or following platinum-containing chemotherapy therapy, or who have disease progression within 12 months of neoadjuvant or adjuvant treatment with platinum-containing chemotherapy; ⁷ Includes expansion cohorts in non small cell lung cancer, small cell lung cancer and triple negative breast cancer; ⁸ On April 24, 2017 Merck KGaA, Darmstadt, Germany announced the divestment of its Biosimilars business to Fresenius, closing is expected in H2 2017, subject to regulatory approvals and other conditions; ⁹ As announced on March 30, 2017 in a agreement with Avillion, anti-IL-17 A/F nanobody will be developed by Avillion for plaque psoriasis and commercialized by Merck KGaA, Darmstadt, Germany

Avelumab plays predominantly in attractive and differentiated niches



Illustration; Sources: Trialstrove 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 to lead in niche indications (e.g. Merkel cell) or markets (e.g. Asia for gastric)
- Quick to market strategy (e.g. BTB designation for MCC)
- 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

- Learn from experience of incumbents/early movers in major indications (e.g. NSCLC, Bladder)
- Potential for combinations given breadth of combined development pipelines
- Differentiate in trial design and explore application of further biomarkers



The alliance initiated nine Phase III studies

	Indication	Treatment line	Estimated patient enrollment	Comparator	Estimated primary completion
1	Ovarian	Platinum res./ref.	550	Pegylated liposomal doxorubicin	H1 2018
2	Ovarian	1 st line	951	Platinum-based chemotherapy	H2 2019
3	NSCLC	1 st line	1095	Physician's choice of platinum containing chemotherapy	H1 2019
4	NSCLC	2 nd line	792	Docetaxel/chemotherapy	H1 2018
5	Gastric	1 st line maint.	666	Best supportive care (BSC)	H1 2019
6	Gastric	3 rd line	330	Physician's choice of chemotherapy/BSC	H2 2017
7	Bladder	1 st line maint.	668	Best supportive care	H2 2019
8	Renal cell	1 st line	583	Sunitinib	H1 2018
9	SCCHN	Front-line	640	Standard of care chemoradiation therapy	H1 2021

Clinical results support avelumab as therapeutic option for metastatic Merkel cell carcinoma

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



For Avelumab, combinations will drive differentiation strategy



- **In registration: metastatic Merkel Cell (EU)**
- Phase III: Ovarian (1L & Plat. Res. Ref.)¹
- Phase III: Gastric (1L MN & 3L)
- Phase III: NSCLC (1L & 2L)
- Phase III: Urothelial (1L MN)
- Phase III: SCCHN (Locally advanced, Front line)
- Phase II: Merkel Cell (1L)
- Multiple other tumor types

- **Phase III: Ovarian 1L & Plat. Res. Ref.**¹
(Avelumab + Chemotherapy)
- **Phase III: Renal 1L**
(Avelumab + Inlyta)
- **Phase III: L/A Head and Neck**
(Avelumab + Chemoradiation)
- **Phase I: DLBCL**²
(Avelumab + various agents)
- **Phase I/II: Advanced malignancies**
(Avelumab + 4-1BB / + OX40)
- **Phase Ib/II: Ovarian**
(Avelumab + Entinostat; Syndax)
- **Phase I/Ib: Ovarian**
(Avelumab + VS-6063; Verastem)
- **Phase I/II: SCCHN**
(Avelumab + TG4001; Transgene)
- **Phase Ib/II: NSCLC**
(Avelumab + VX15/2503; Vaccinex)
- **Phase I/Ib: NSCLC**
(Avelumab + Debio1143; Debiopharm)
- **Phase I/Ib: Glioblastoma and Colorectal**
(Avelumab + VXM01; VAXIMM)

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

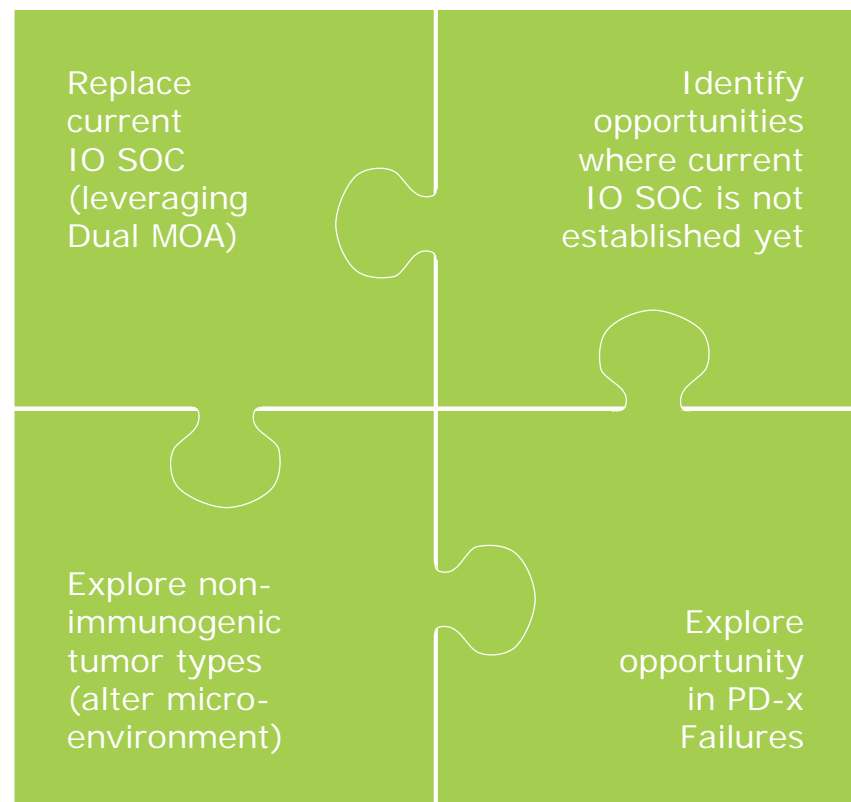
- Merck KGaA, Darmstadt, Germany aims to address significant unmet needs for agents delivering high efficacy with favorable safety profile in a convenient dosing regimen
- Administered orally (tablet formulation)
- Extremely short treatment courses (8–10 days per year) leading to long-term efficacy¹

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.

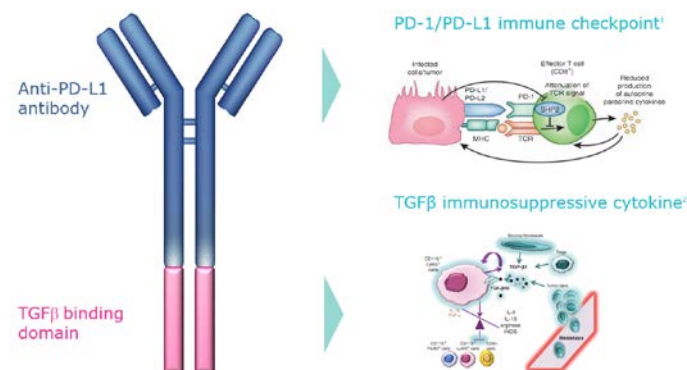
PD-L1–TGF-beta indicates potential to move beyond checkpoint inhibitors

Four focus areas for exploration



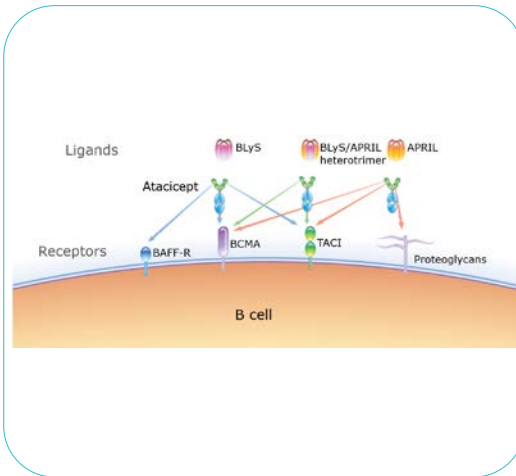
Status and next steps

- 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
- Recruiting into Ib expansion cohorts started in Q3 2016



Update on selected assets (1/2)

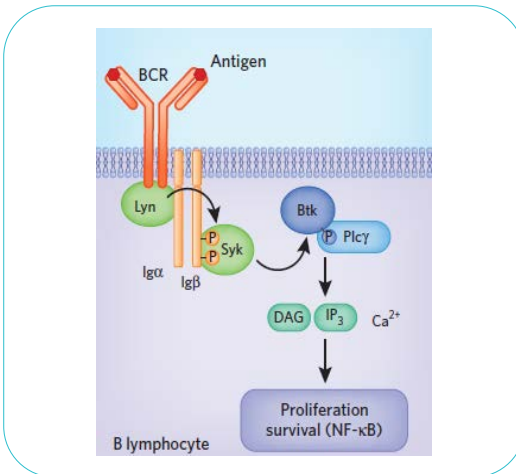
Atacicept



- 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 (Phase IIb) in SLE patients (n=306):
- Primary endpoint not met, but analyses of predefined subpopulation with high disease activity (HDA; n=158) demonstrated statistically significant treatment effects (e.g. SRI-6 response at week 24 significantly greater with atacicept 150 mg vs. placebo); both doses led to significant reductions in BILAG A and SFI flares

Phase III decision subject to interactions with authorities

BTK

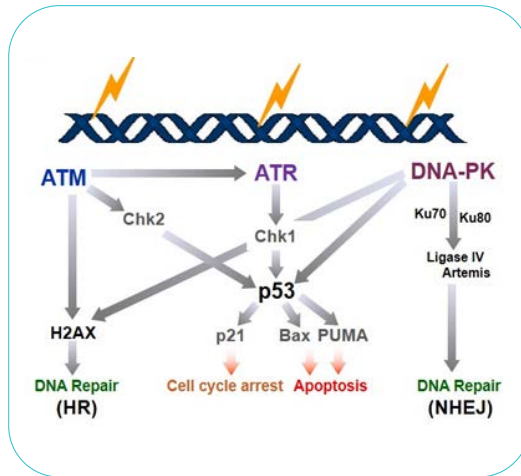


- Suppress autoantibody-producing cells
- High and differentiated efficacy in preclinical models; promising kinase selectivity profile
- Aim to achieve best in class through minimization of off-target effects
- Three immunology phase II trials initiated (RA, MS, SLE)
- Phase I trial in Oncology ongoing (different molecule)
- Partnering opportunities under consideration

Phase IIa signal confirmation in Q2 2017 (RA)

Update on selected assets (2/2)

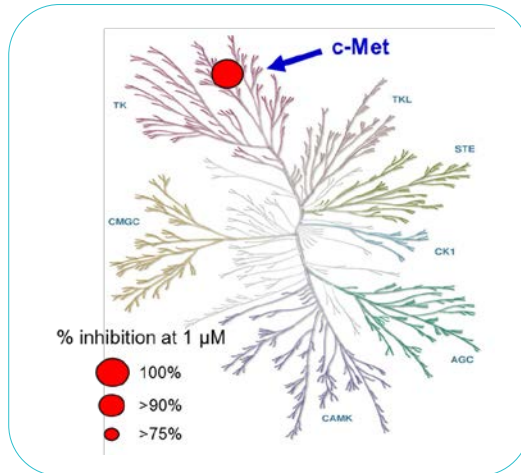
DDR-program



- M3814 is a selective and potent inhibitor of DNA-PK, a kinase mediating DNA double strand break repair
- Preclinical models 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 DDR programs licensed-in, incl. two ATR compounds VX-970¹/VX-803², and one DNA-PK compound VX-984³, which will be combined with existing DNA-PK assets (M3814) into a single development program

Analysis of M3814 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 and graphics are only illustrative

¹Includes expansion cohorts in non small cell lung cancer, triple negative breast cancer and small cell lung cancer; ²VX-803 is an orally dosed ATR inhibitor currently in Phase 1 trials evaluating escalating doses of VX-803 alone and in combination with chemotherapy; ³A Phase 1 trial is now evaluating escalating doses of VX-984 alone and in combination with pegylated liposomal doxorubicin in subjects with advanced solid tumors

Key ASCO abstracts at a glance (two oral presentations)

MCC (1L)

- Initial results from a cohort of chemotherapy-naïve pts with mMCC (ongoing study)
- Manageable safety profile, consistent with findings for 2L+ cohort
- **Unconfirmed ORR: 64.0%** (≥6 weeks follow-up) / **Confirmed ORR: 56.3%** (≥3 months follow-up)
- Avelumab is associated with early responses; preliminary results suggest that responses mature to become durable

NSCLC

- Exposure-response and PD-L1 expression analysis of NSCLC 2L (Phase I cohort)
- Patients in upper half of increased exposure ($C_{troughfirst}$ -dose quartiles Q3-Q4) showed increasing ORR (by higher PD-L1-staining level); **ORR: 25% (≥1%); 26% (≥5%); 33% (≥50%); 43% (≥80%)***
- Analysis provides rationale for the modification of the NSCLC 1L Phase III trial

Urothelial

- Updated efficacy and safety data of avelumab in metastatic urothelial carcinoma 2L (pooled Phase Ib)
- Durable responses in heavily pretreated patients, irrespective of tumor PD-L1 expression status
- **Confirmed ORR: 17.4%; 6.2% CR** (≥6m follow-up)

RCC (oral presentation)

- First line avelumab + axitinib therapy in patients with advanced renal cell carcinoma 1L (Phase Ib)
- Preliminary findings confirm manageable safety profile and consistent with agents administered as monotherapy
- **Confirmed ORR: 54.5%**, based on 2 CR and 28 PR (follow-up ongoing)

Anti PD-L1/ TGF-beta trap (oral presentation)

- Preliminary results from Phase I dose-escalation study (bifunctional fusion protein targeting PD-L1 and TGF-β)
- Manageable safety profile in patients with heavily pre-treated advanced solid tumors
- Early signs of clinical efficacy: **1 ongoing confirmed CR** (cervical) and **1 durable PR** (pancreatic), a 25% reduction in the sum of diameters of target lesions after 2 doses of M7824 (cervical), and 2 cases of prolonged stable disease (pancreatic; carcinoid).

Source: ASCO abstracts; Acronyms: ORR: Objective Response Rate | PFS: Progression-free survival | OS: Overall Survival | CR: complete response | PR: partial response

*These ORRs are higher compared to the lower half

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.

Newsflow: Upcoming pipeline catalysts

Avelumab	▶ Expected EMA decision (MCC)	▶ H2 2017
BTK inhibitor (RA)	▶ Phase IIa signal confirmation ¹	▶ Q2 2017
M7824 (anti PD-L1 – TGF-beta trap)	▶ Phase I interim data ¹	▶ mid 2017
Cladribine tablets	▶ Expected EMA decision	▶ Q3 2017
Sprifermin	▶ Final Phase II data readout ¹	▶ Q3 2017
Avelumab	▶ Phase III data readout (Gastric 3L) ¹ ▶ Phase III data readout (NSCLC 2L) ¹	▶ Q1 2018 ▶ H1 2018
Atacicept	▶ Phase III decision	▶ Subject to interaction with authorities

Note: Timelines are event-driven and may change; Acronyms: MCC = Merkel cell carcinoma | RA: Rheumatoid Arthritis | NSCLC: Non small cell lung cancer
(1) Data-read out is internal date. Data to be presented at upcoming scientific congress.

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

Three submissions in 2016 may potentially result in two product launches in 2017

Disciplined execution

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

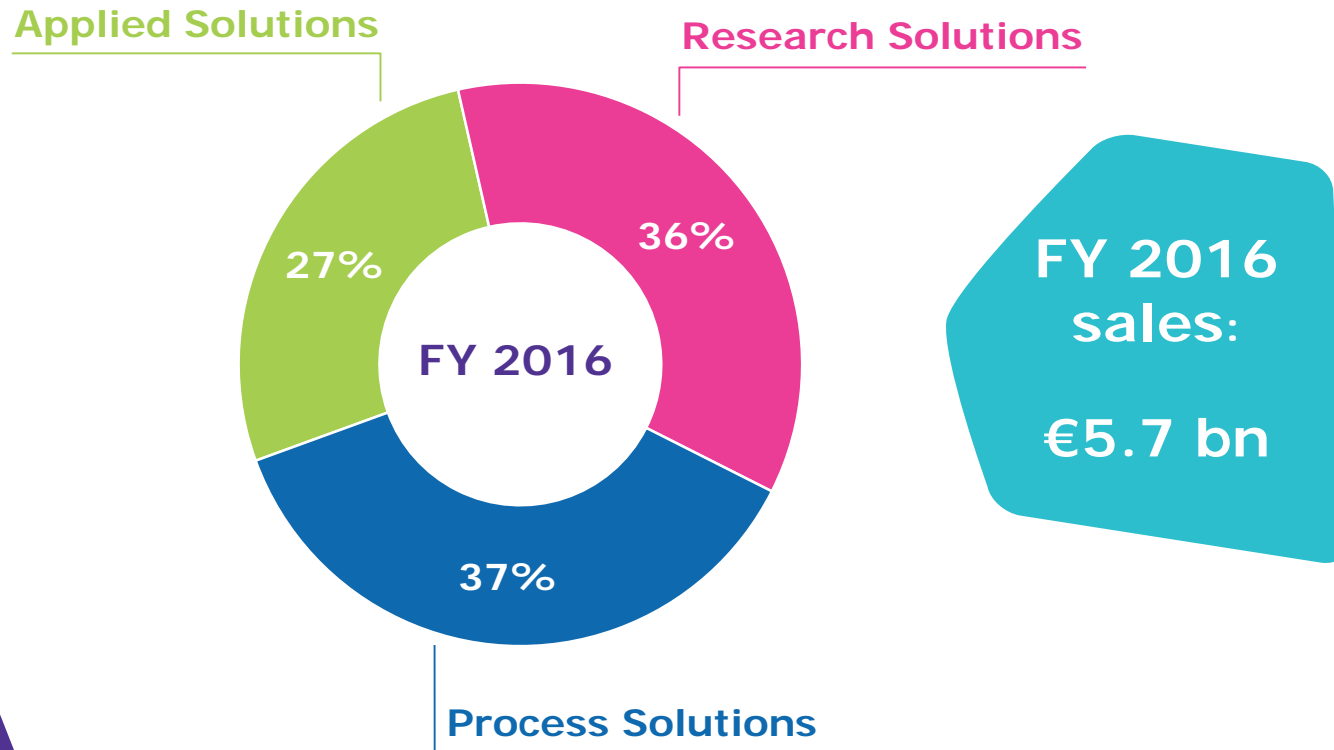




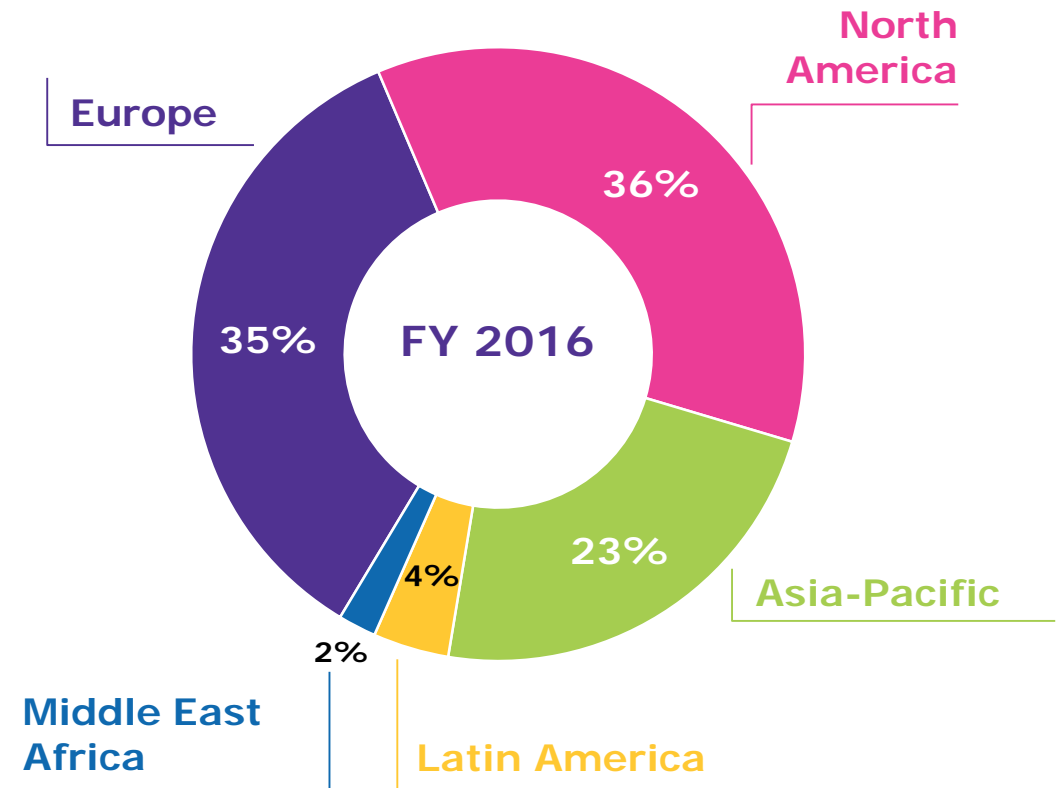
03 LIFE SCIENCE

A balanced portfolio and geographic presence

Sales by business unit



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®

BioReliance®

EMPROVE®

cGMP SOLUTIONS & SERVICES

#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



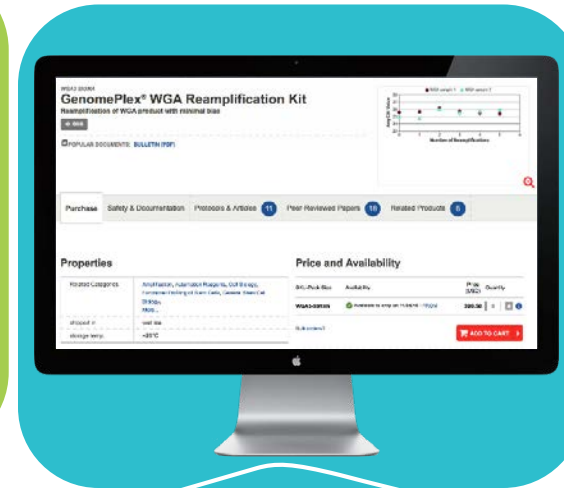
CONTENT



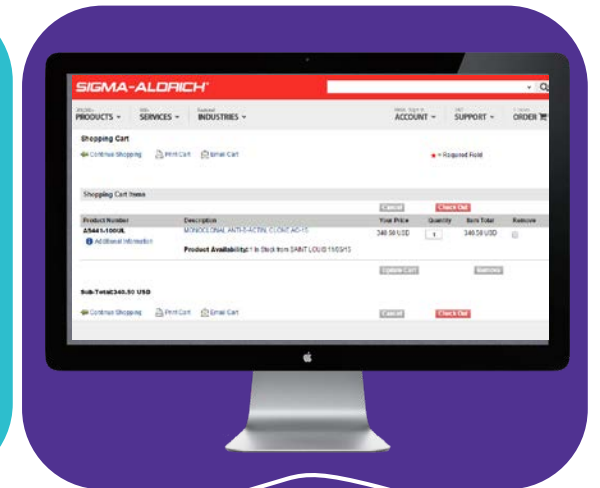
Online leader in scientific content: articles, protocols and peer reviewed papers



ORDER



Real-time pricing and availability



Convenient and simple customer interface: no more than 2 clicks from shopping cart

Life Science delivers synergies and integrates as planned

synergies

Delivery of 2016 synergy target of €105 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

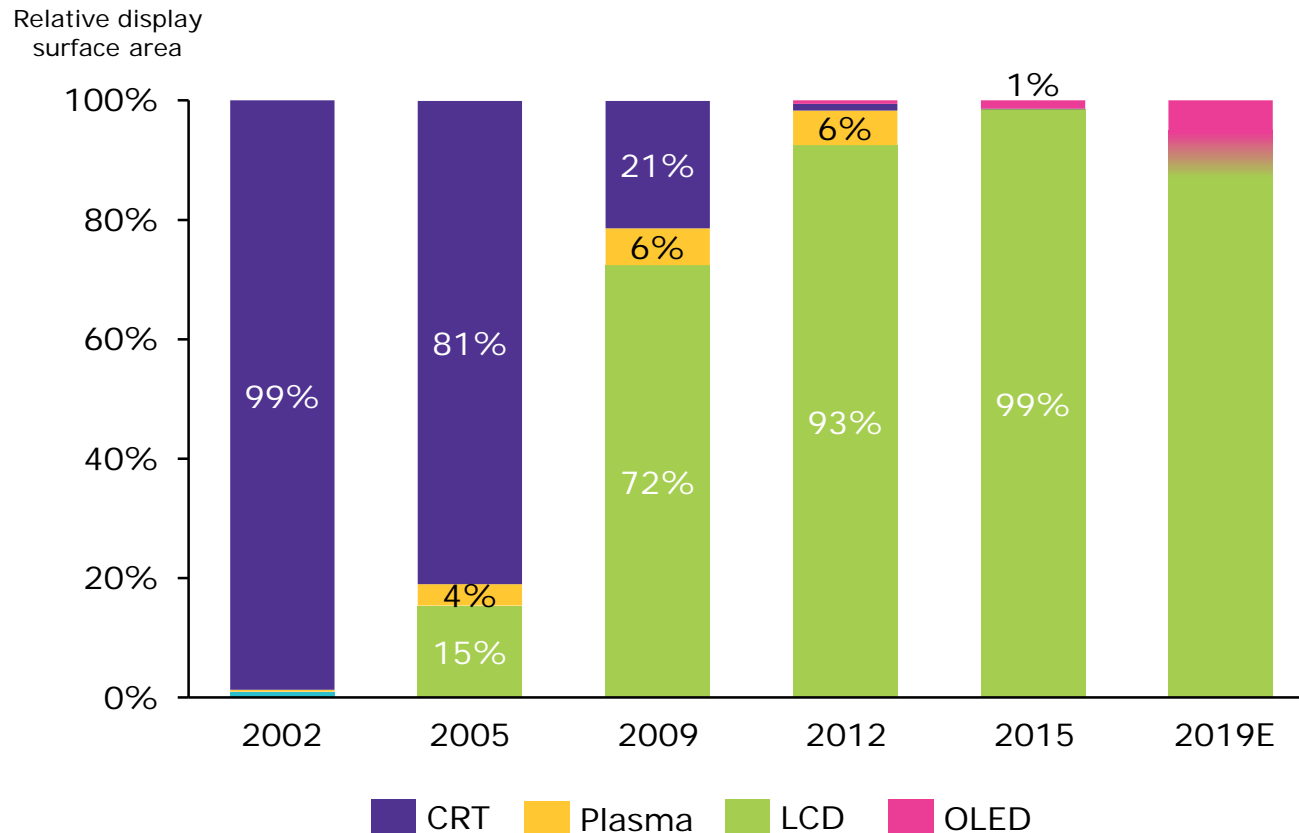


04

PERFORMANCE MATERIALS

Liquid crystals are clearly the dominant display technology

Market share by display technology



Rationale for LCD leadership

For consumers:

- Price
- Thinner frames
- Higher resolution in all sizes
- Proven track record of extreme reliability

For manufacturers:

- Price and scalability
- Production costs and capacities

LCD progress creates higher technological and commercial entry barriers

OLED share will increase in mobile applications

Our leading OLED business is well set to exploit display market opportunities

Market position

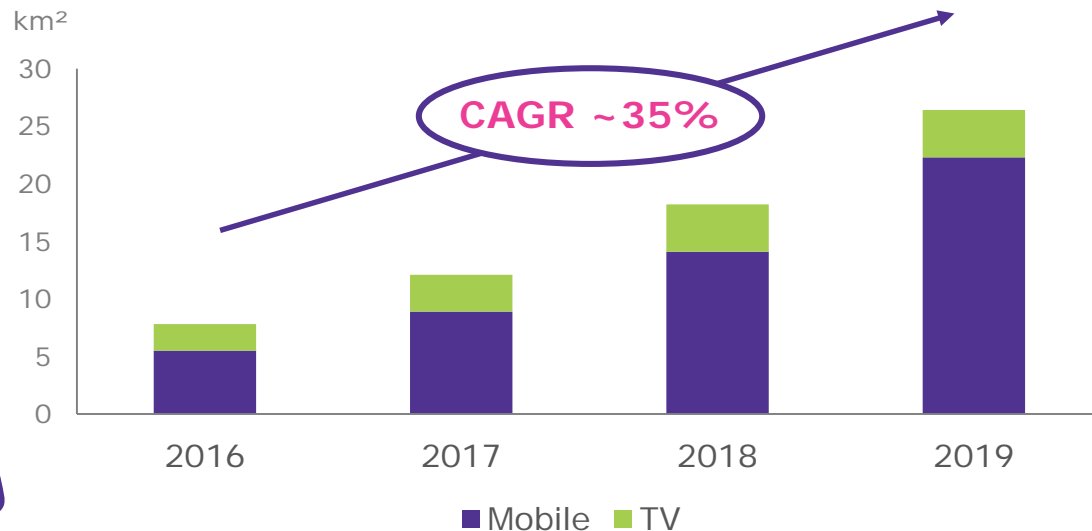
- Among top 3 OLED material provider
- Unrivalled experience and expertise in displays
- Long & intimate relationships with all display producers
- Recent capacity expansion to serve growing demand

our ambition

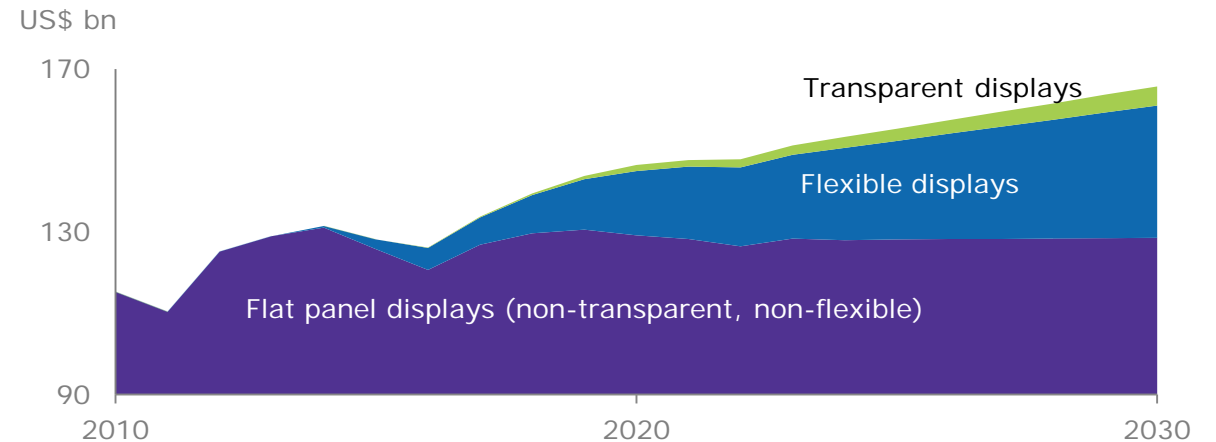
solution provider

- Supplier of all OLED stack layers
- Excellence in vapor & printable materials
- In-house testing of materials
- Tailor-made solutions for customers

Announced OLED capacity expansion¹



Display market development¹



Liquid crystals OFFER a variety of opportunities



1

3

4

5

2

6

1. Adaptive lighting for automotive
2. Adaptive lighting for architecture
3. Smart antenna
4. Liquid crystal windows for architecture
5. Holography
6. Free form LCD

We have a strong position and will benefit further from complex technological advances and underlying market trends

Market drivers and technological trends

Miniaturization: Devices are becoming smaller with better performance

- Need for enabling materials to reduce size (Moore's law)

Mobility: Everyone is continuously connected without direct power supply

- More chips needed for local energy production
- Energy storage → smaller batteries with higher density

Internet of Things: Everything is continuously connected

- More gadgets and devices that include chips
- Increasing amount of communication and sensor chips

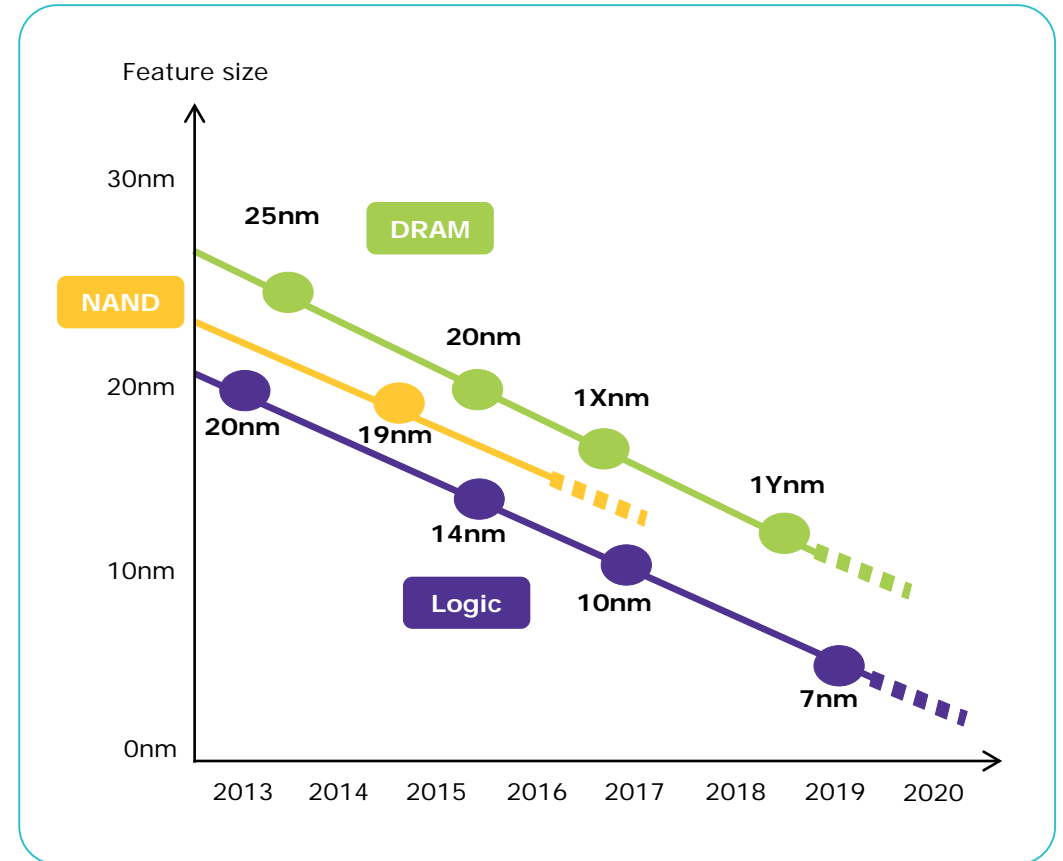
Big Data: Increasing need for intelligent data storage

- Switch from hard disk drives (HDD) to solid state drives (SSD)

Selected competitors

- Tokyo Ohka Kogyo
- Dow Electronic Materials
- Nissan Chemicals
- JSR

Feature sizes develop as predicted by Moore's law



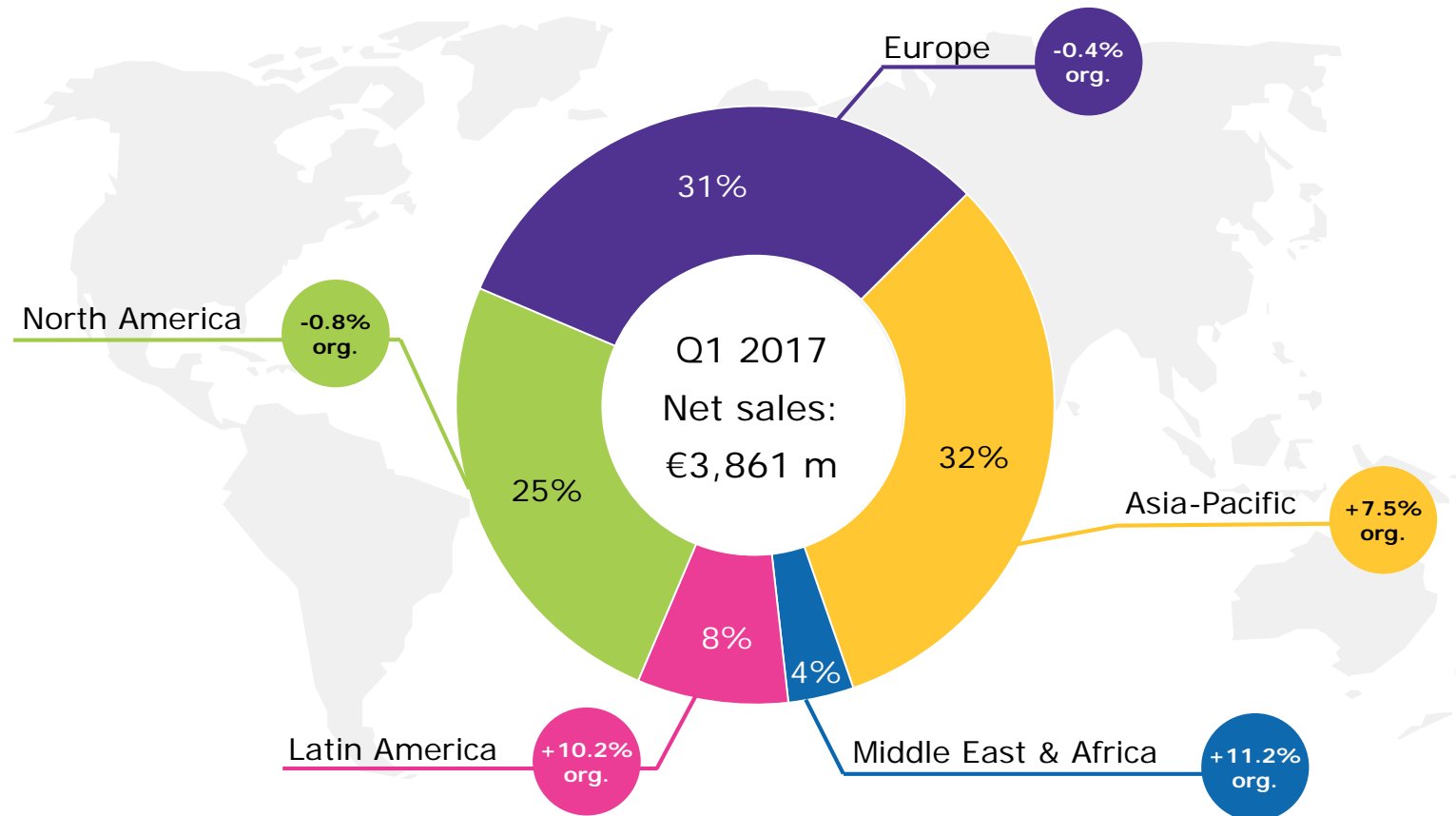


05

FINANCIAL OVERVIEW

Organic growth driven by APAC, LATAM and MEA

Regional breakdown of net sales [€ m]



Regional organic development

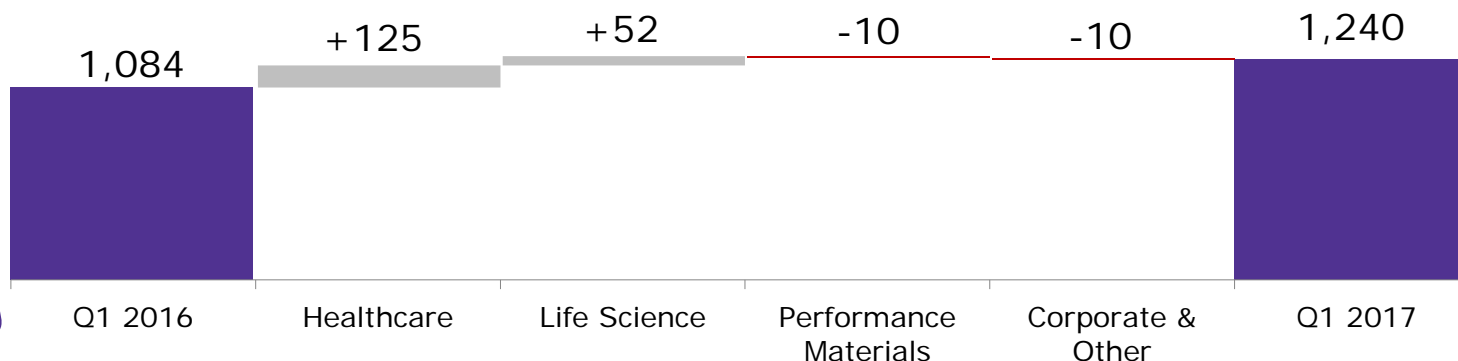
- Slight decline in Europe reflects competition for Rebif, Erbitux and Gonal-f, mitigated by solid demand in Life Science
- North America lower as growth in Life Science is more than offset by Rebif decline and tough Gonal-f comparables
- Good growth in Asia-Pacific mainly driven by Glucophage repatriation in China, strong demand in Process Solutions
- Strong performance in LATAM and MEA across all major businesses

Healthcare and Life Science fuel increase in EBITDA pre

Q1 2017 YoY net sales

	Organic	Currency	Portfolio	Total
Healthcare	4.4%	2.0%	-1.0%	5.4%
Life Science	3.3%	2.4%	0.4%	6.1%
Performance Materials	-0.9%	4.5%	0.0%	3.6%
Group	3.1%	2.6%	-0.3%	5.3%

Q1 YoY EBITDA pre contributors [€ m]



- Healthcare reflects strong growth in General Medicine, especially Glucophage China
- Organic performance in Life Science driven by all business units
- Strong growth of Integrated Circuit Materials and Pigments mitigates LC decline
- HC benefits from first approval milestone, net benefit from royalty swap (~€100m) and organic performance
- Life Science driven by organic growth and ongoing synergy realization
- Performance Materials slightly lower due to business mix and higher R&D
- Corporate EBITDA pre contains hedging and investments in corporate initiatives

Q1 2017: Overview

Key figures

[€m]	Q1 2016	Q1 2017	Δ
Net sales	3,665	3,861	5.3%
EBITDA pre	1,084	1,240	14.5%
Margin (in % of net sales)	29.6%	32.1%	
EPS pre	1.54	1.80	16.9%
Operating cash flow	352	777	120.6%

[€m]	Dec. 31, 2016	March 31, 2017	Δ
Net financial debt	11,513	11,113	-3.5%
Working capital	3,486	3,953	13.4%
Employees	50,414	51,480	2.1%

Comments

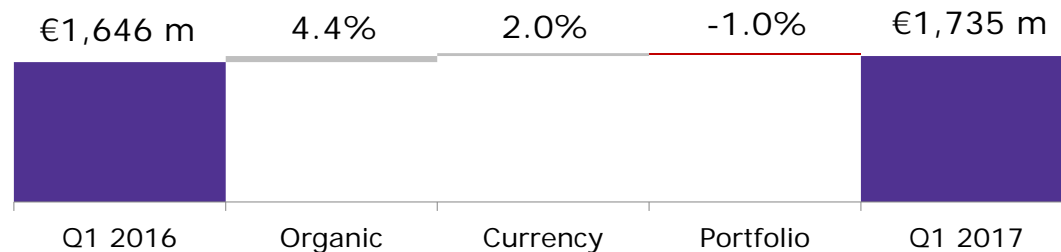
- EBITDA pre & margin increase mainly driven by royalty income swap
- Strong EPS pre growth due to higher EBITDA pre
- Operating cash flow reflects high profit and positive tax effects
- Net financial debt reduction driven by strong operating cash flow
- Working capital reflects increased receivables mainly due to Glucophage repatriation
- Higher headcount due to investments in growth markets and takeover of temporary workers

Healthcare: Solid base business and one-time gains supporting margin

Healthcare P&L

[€m]	Q1 2016	Q1 2017
Net sales	1,646	1,735
Marketing and selling	- 613	-656
Administration	- 71	-77
Research and development	- 378	-376
EBIT	641	445
EBITDA	829	629
EBITDA pre	508	633
Margin (in % of net sales)	30.9 %	36.5%

Net sales bridge

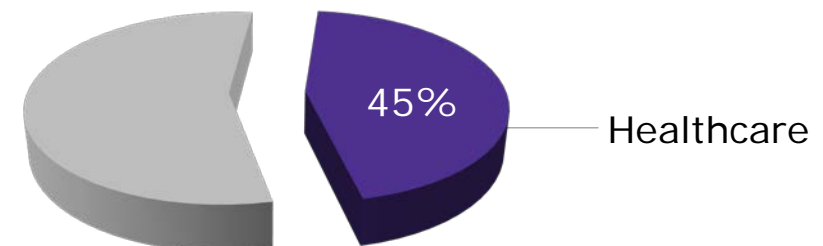


*Productive Development Partnership
Totals may not add up due to rounding

Comments

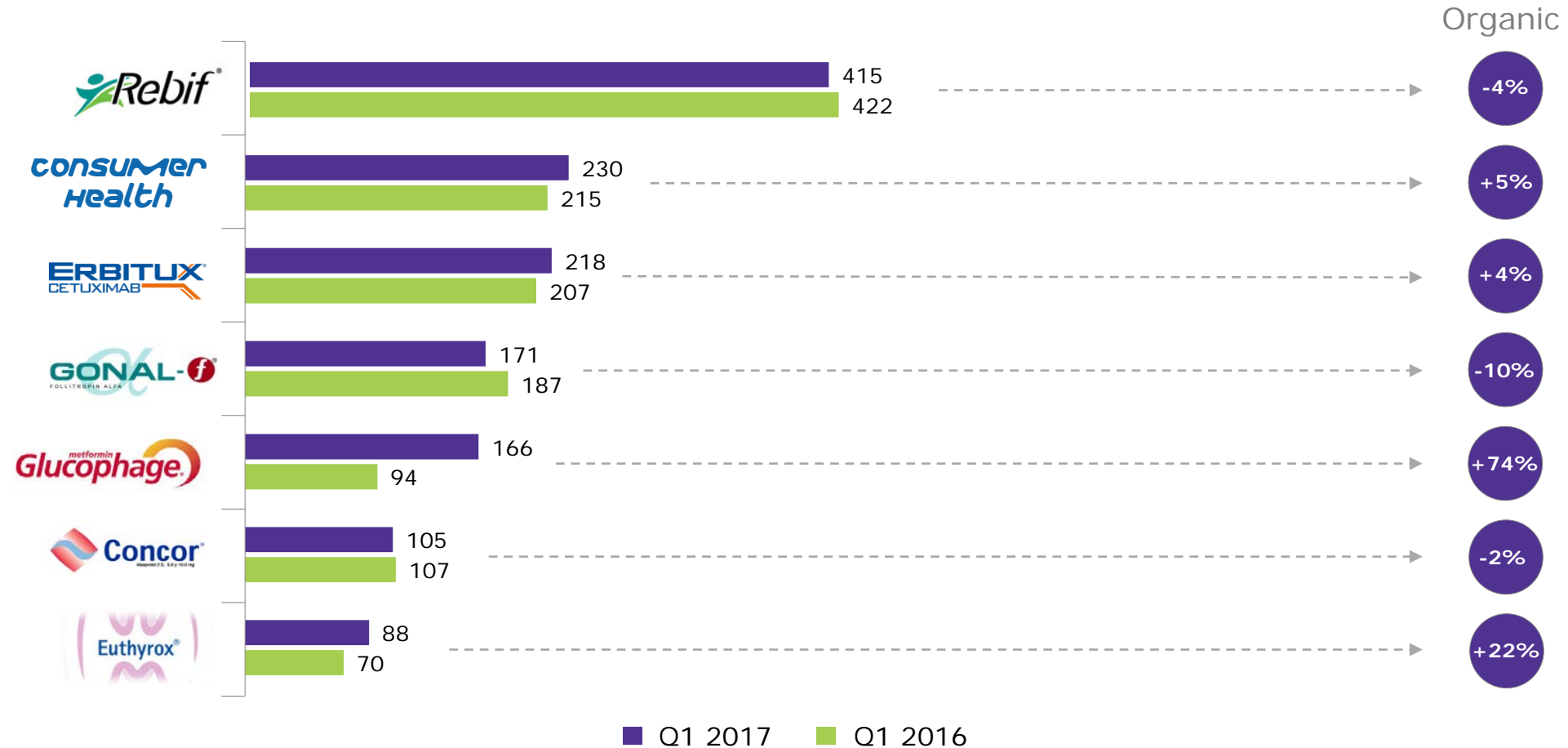
- Organic growth supported by Glucophage repatriation in China
- Rebif with ongoing volume and price declines in Europe outweighing U.S. pricing and contribution from PDP* in Brazil
- Erbitux shows moderate organic growth benefiting from demand in growth markets; competitive pressure in Europe persists
- Marketing & selling reflects investments for launch preparations and costs for Glucophage repatriation in China
- R&D costs phased – ramp-up towards coming quarters
- EBIT last year contained Kuvan disposal gain of €324 m
- Profitability spike mainly driven by net benefit of royalty income swap (~€100m) and Bavencio milestone, outweighing negative product mix

Q1 2017 share of group net sales



Healthcare organic growth by franchise/product

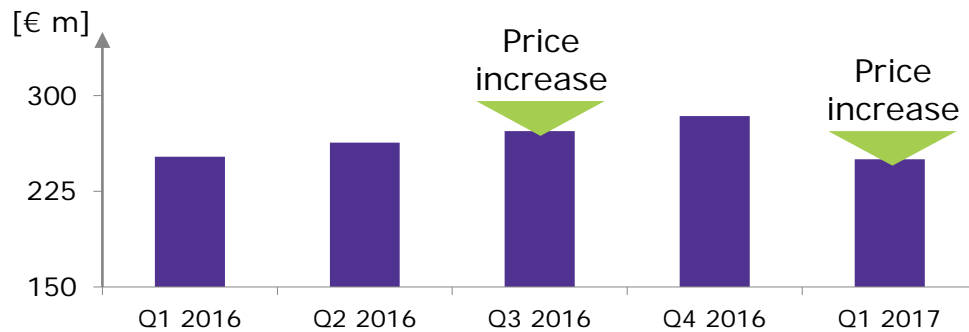
Q1 2017 organic sales growth [%] by key franchise/products [€ m]



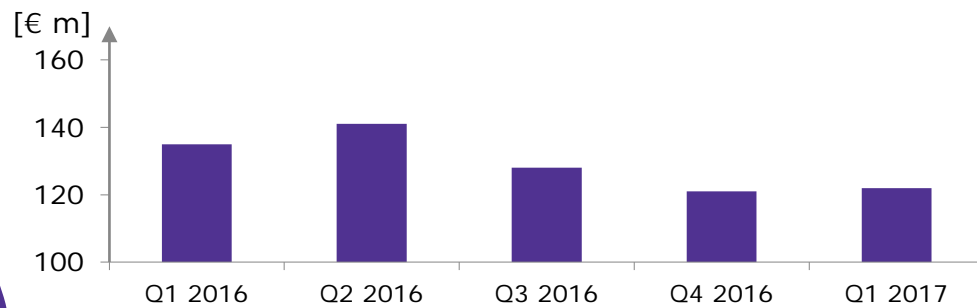
Rebif: Relief in the U.S. – competitive ramp-up in Europe ongoing

Rebif sales evolution

North America



Europe



Q1 drivers

-4.6% org.



Price



Volume



FX

Q1 drivers

-9.3% org.



Price



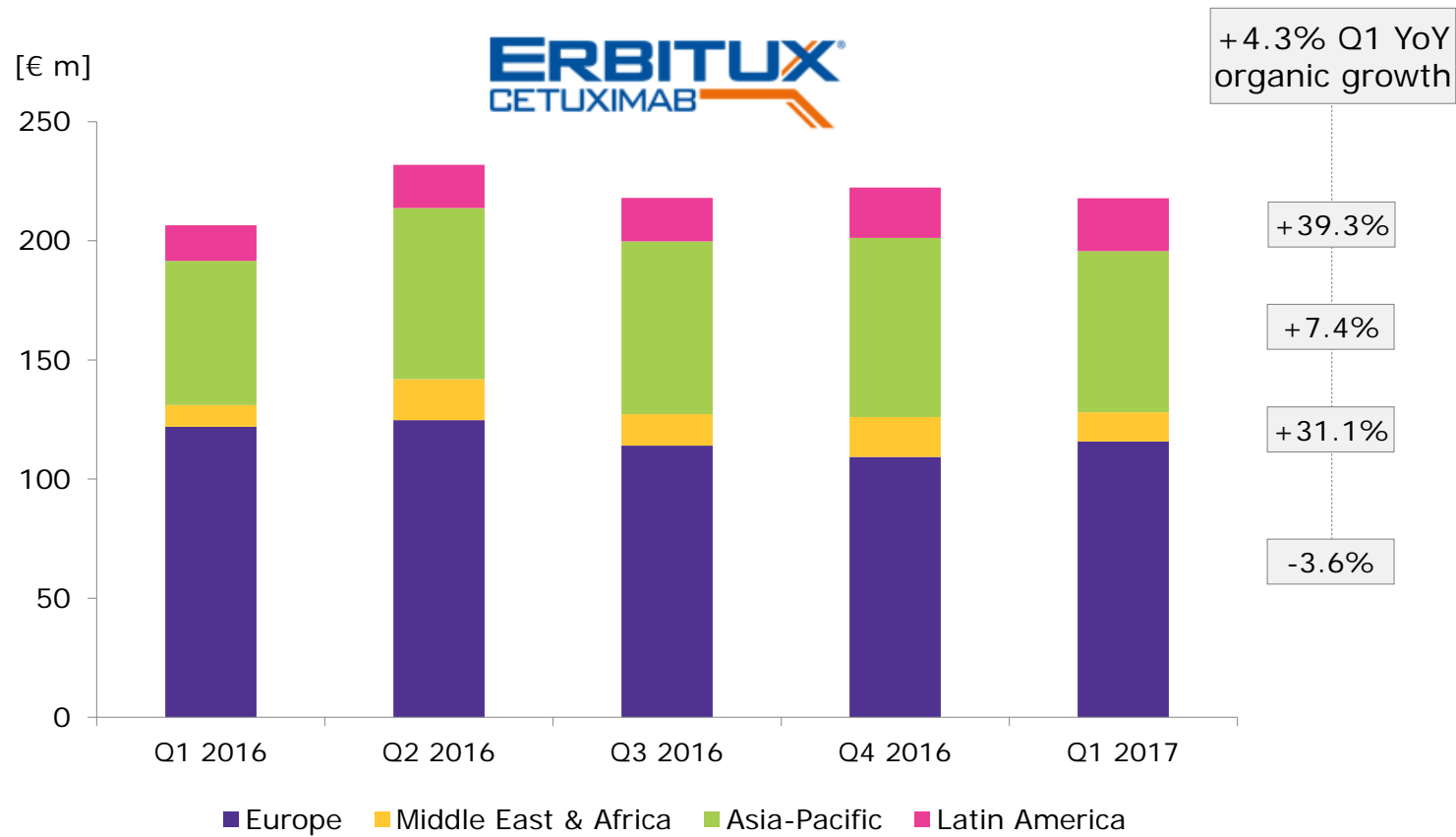
Volume

Q1 2017 Rebif performance

- Rebif sales of €415 m in Q1 2017 reflect organic decline of -4.0% and positive FX effects from the U.S.
- U.S. price increase in January, partially offsets U.S. volume erosion
- Market shares within interferons stable due to high retention rates and known long-term track record
- Phased market entry of orals and mandatory price cuts in Europe cause ongoing organic decline
- Productive Development Partnership (PDP) in Brazil supports Rebif growth in LATAM

Erbitux: A challenging market environment

Erbitux sales by region



Q1 2017 Erbitux performance

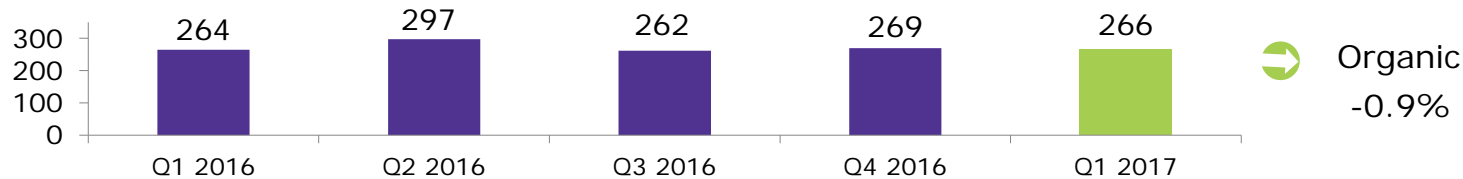
- Sales increase to €218m due to solid volume development in growth markets and slight FX tailwinds
- Europe impacted by competition and shrinking market size due to increasing Immuno-Oncology trials
- APAC with healthy organic growth driven by higher volumes in China
- LATAM and MEA shows strong growth from higher demand, but also benefited from tender phasing

Strong organic growth of General Medicine driven by Glucophage repatriation

Sales evolution

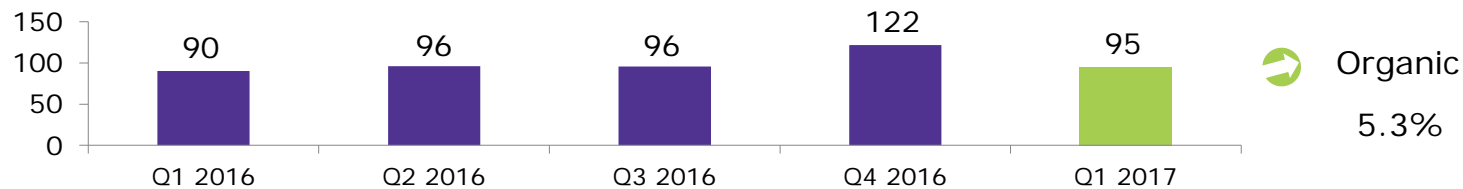
Fertility

[€ m]



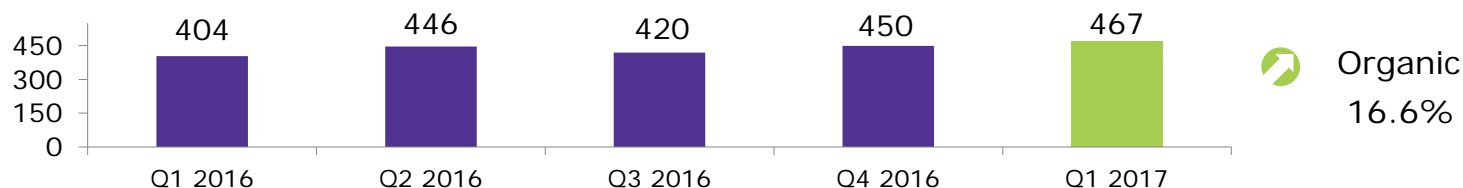
Endocrinology

[€ m]



General Medicine*

[€ m]



Q1 2017 organic drivers

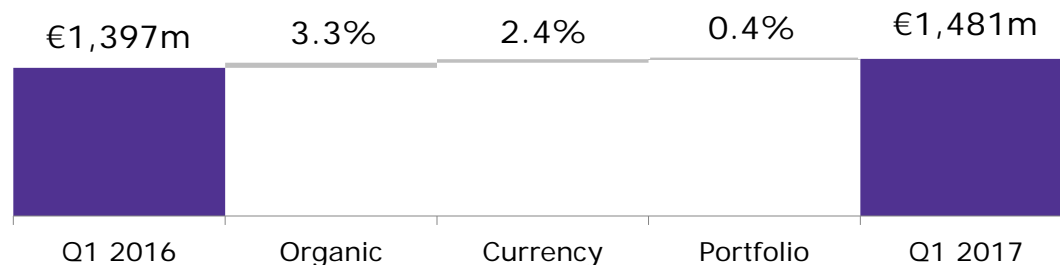
- Fertility slightly lower, mainly due to Gonal-f facing tough comps and competition from biosimilars in Europe
- Other fertility drugs continue to grow across all major regions
- Release of accruals for rebates for Saizen supports Endocrinology growth
- General Medicine growth benefits from Glucophage China repatriation
- Euthyrox posts strong growth driven by ongoing strong demand from China
- Concor slightly negative due to order phasing in Russia

Life Science: Ongoing synergy realization drives margin progression

Life Science P&L

[€m]	Q1 2016	Q1 2017
Net sales	1,397	1,481
Marketing and selling	- 421	-449
Administration	- 63	-70
Research and development	- 62	-62
EBIT	105	236
EBITDA	284	430
EBITDA pre	393	445
Margin (in % of net sales)	28.1 %	30.1%

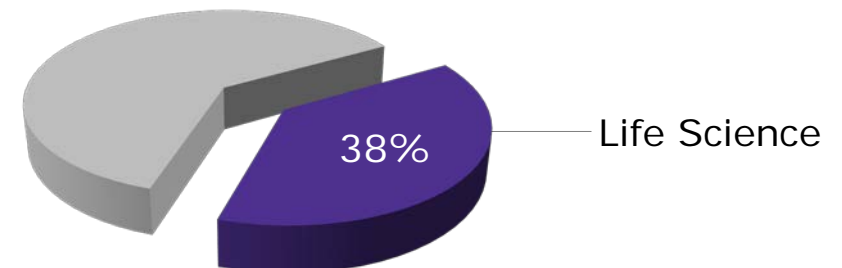
Net sales bridge



Comments

- Process Solutions benefits from robust demand for single-use and upstream, but against tough comps & soft start at some larger accounts
- Applied Solutions shows solid organic growth, fueled by robust demand for food & beverage testing and lab water platform
- Research Solutions posts slight organic growth from solid demand in growth markets outweighing challenging U.S. market environment
- Marketing & selling increase in line with sales progression
- Q1 2016 EBIT affected by inventory step-up for Sigma-Aldrich
- Profitability reflects ongoing synergy realization and organic growth

Q1 2017 share of group net sales

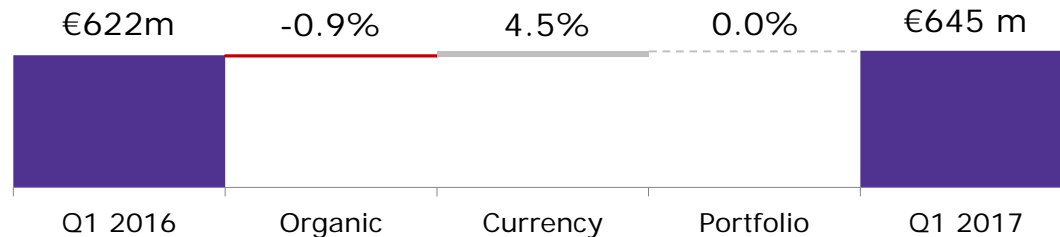


Performance Materials: Top line recovery despite still declining Liquid Crystals

Performance Materials P&L

[€m]	Q1 2016	Q1 2017
Net sales	622	645
Marketing and selling	-58	-62
Administration	-16	-18
Research and development	-48	-58
EBIT	207	195
EBITDA	267	257
EBITDA pre	273	263
Margin (in % of net sales)	43.9 %	40.9%

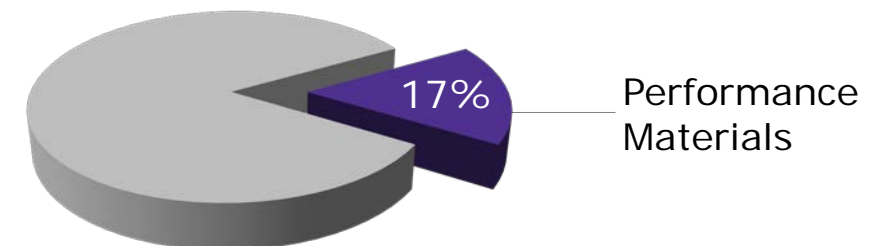
Net sales bridge



Comments

- Organic growth of Integrated Circuit Materials, Pigments and OLED mitigate LC softness
- Liquid Crystals impacted by further market share normalization
- Integrated Circuit Materials with record quarter and above market growth due to strong demand from key accounts
- Pigments & Functionals post solid organic growth mainly driven by coatings applications especially automotive
- R&D increase reflects investments in LC technologies beyond displays
- Sound profitability despite negative business mix & higher R&D

Q1 2017 share of group net sales



Reported figures reflect solid business and royalty income swap

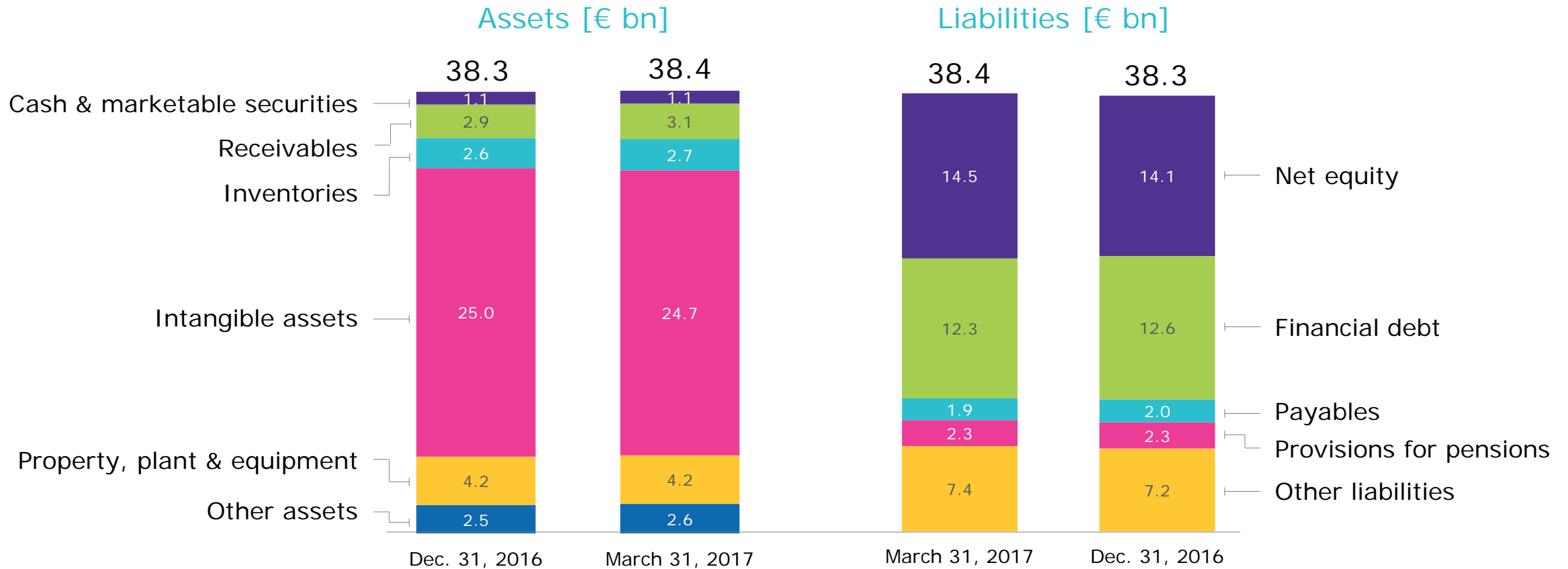
Reported results

[€m]	Q1 2016	Q1 2017	Δ
EBIT	849	755	-11.1%
Financial result	-68	-71	3.6%
Profit before tax	780	684	-12.4%
Income tax	-187	-161	-14.1%
<i>Effective tax rate (%)</i>	<i>24.0 %</i>	23.5%	
Net income	591	521	-11.8%
EPS (€)	1.36	1.20	-11.8%

Comments

- EBIT decline reflects income from Kuvan sale LY
- Stable financial result – deleveraging compensated by higher interest rates and positive LTIP effect LY
- Effective tax rate within guidance range of ~23-25%

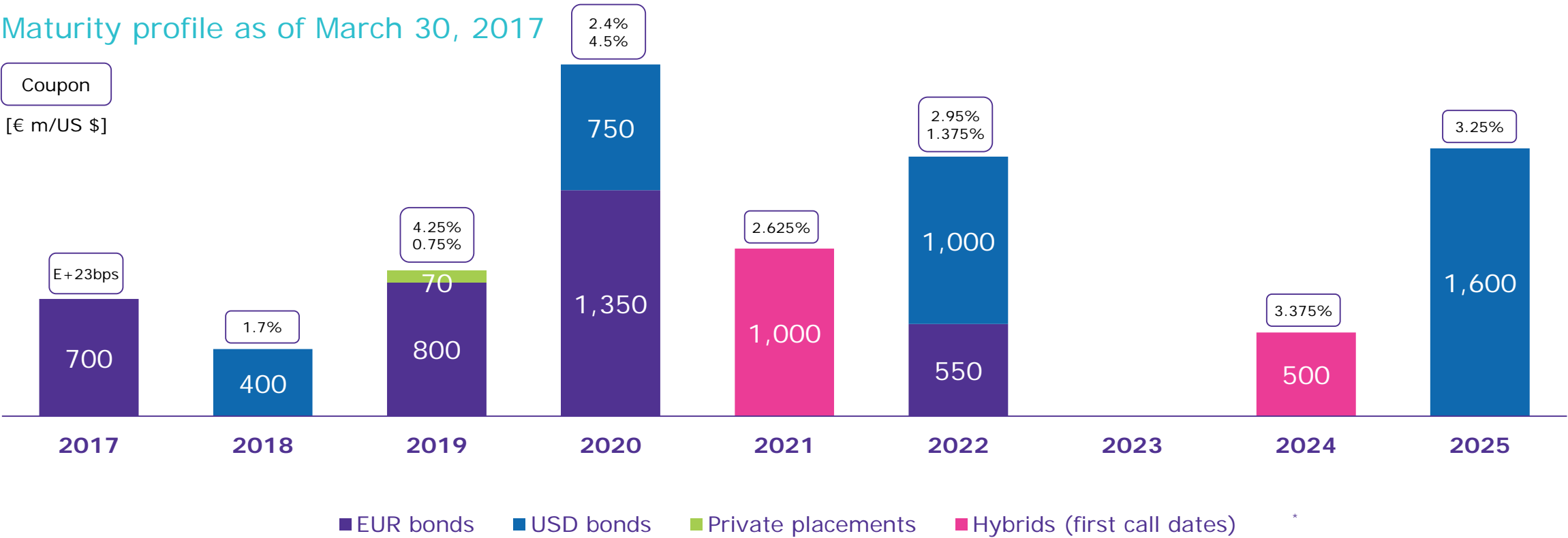
Balance sheet – focus on rapid deleveraging



- Total assets about stable, while equity ratio increases to 37.8%
- Reduction of intangible assets reflects D&A and FX, more than offsetting new assets from Vertex licensing deal

- Net equity increase driven by profit after tax
- USD250 m bond repayment reduces financial debt

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



Financing structure enables flexible and swift deleveraging

Strong operating cash flow benefits from royalty swap and tax effects

Q1 2017 – cash flow statement

[€m]	Q1 2016	Q1 2017	Δ
Profit after tax	593	523	-70
D&A	433	448	15
Changes in provisions	21	51	30
Changes in other assets/liabilities	-34	134	168
Other operating activities	-394	-11	383
Changes in working capital	-266	-368	-102
Operating cash flow	352	777	425
Investing cash flow	284	-402	-686
thereof Capex on PPE	-160	-201	-41
Financing cash flow	-572	-290	282

Cash flow drivers

- LY profit after tax includes gain from Kuvan sale, which is neutralized in other operating activities
- Changes in other assets/liabilities benefit from positive tax effects
- Changes in working capital reflect new Glucophage China business and higher R&D receivables from Pfizer
- Investing cash flow contains increased Capex and Vertex licensing deal; LY included sale of Kuvan
- Financing cash flow reflects repayment of USD250 m bond

Exceptionals in Q1 2017

Exceptionals in EBIT

[€m]	Q1 2016		Q1 2017	
	Exceptionals	thereof D&A	Exceptionals	thereof D&A
Healthcare	-321	0	4	1
Life Science	109	0	16	0
Performance Materials	6	0	7	0
Corporate & Other	7	0	15	3
Total	-198	0	41	4

Financial calendar

Date	Event
June 12, 2017	R&D Update Call
August 3, 2017	Q2 2017 Earnings release
November 9, 2017	Q3 2017 Earnings release
March 8, 2018	Q4 2017 Earnings release
April 27, 2018	Annual General Meeting
May 15, 2018	Q1 2018 Earnings release



CONSTANTIN FEST



Head of Investor Relations
+49 6151 72-5271
constantin.fest@emdgroup.com

SVENJA BUNDSCHUH



Assistant Investor Relations
+49 6151 72-3744
svenja.bundschuh@emdgroup.com

ALESSANDRA HEINZ



Assistant Investor Relations
+49 6151 72-3321
alessandra.heinz@emdgroup.com

ANNETT WEBER



Institutional Investors /
Analysts
+49 6151 72-63723
annett.weber@emdgroup.com

NILS VON BOTH



Institutional Investors /
Analysts
+49 6151 72-7434
nils.von.both@emdgroup.com

EVA STERZEL



Private Investors / AGM /
CMDs / IR Media
+49 6151 72-5355
eva.sterzel@emdgroup.com

OLLIVER LETTAU



Institutional Investors /
Analysts
+49 6151 72-34409
olliver.lettau@emdgroup.com

EMAIL: investor.relations@emdgroup.com
WEB: www.emdgroup.com/investors
FAX: +49 6151 72-913321

