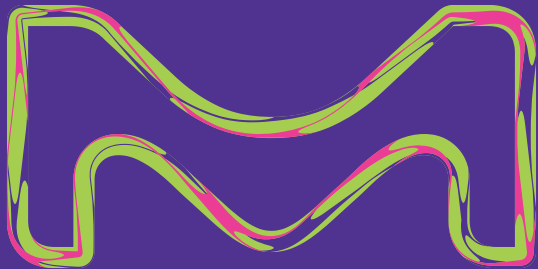




# **MERCK KGAA, DARMSTADT, GERMANY – MORGAN STANLEY EUROPEAN TECHNOLOGY, MEDIA & TELECOM CONFERENCE**

Michael Heckmeier, EVP of Display Solutions

Barcelona – November 15th, 2018





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01

## **BUSINESS OVERVIEW**

Group

## A platform of three high-tech & science businesses to compete in attractive markets



### Leading in specialty pharma markets

- Biologics and small molecules
- Research focus: Oncology, Immunology & Immuno-Oncology



### Leading life science company

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

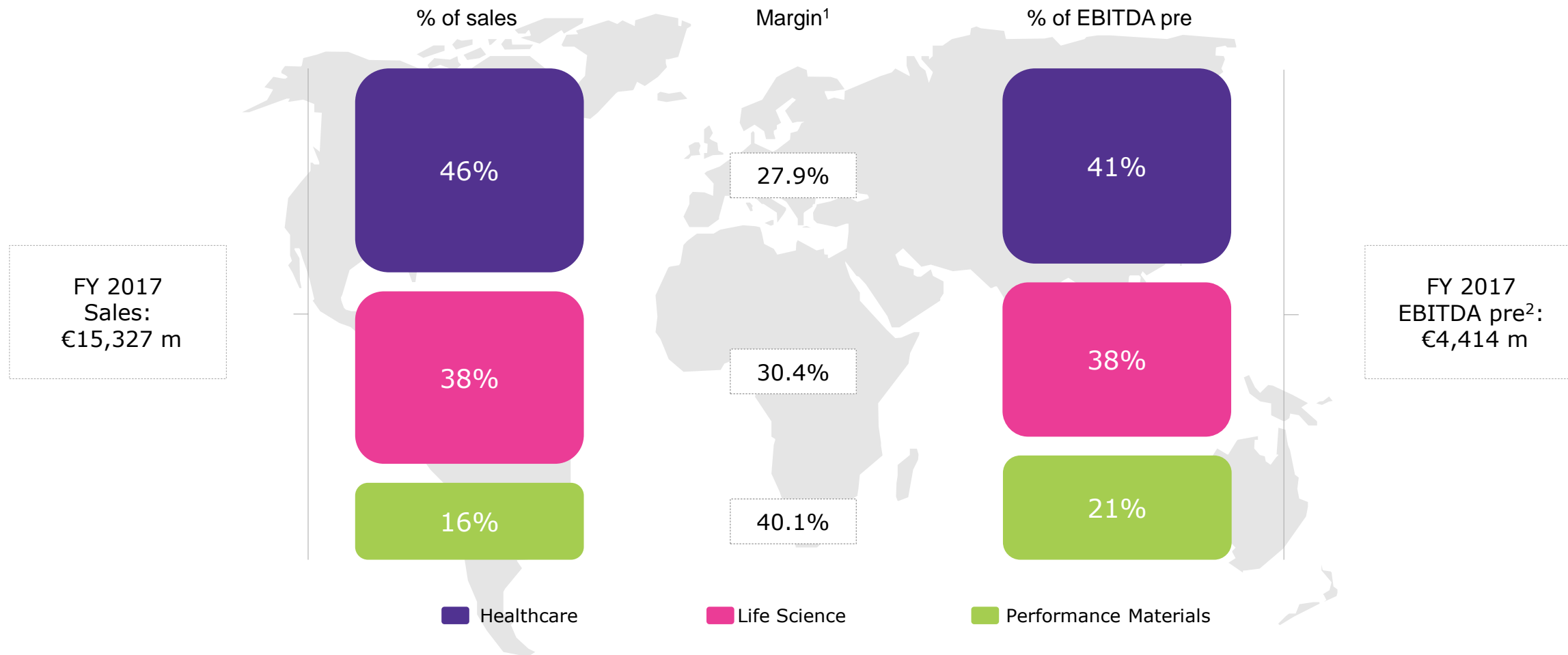


### Leading Company in high-tech solutions

- High-tech solutions and materials for electronics
- Broad portfolio of decorative and functional solutions

# Group

## Strong businesses with attractive margins

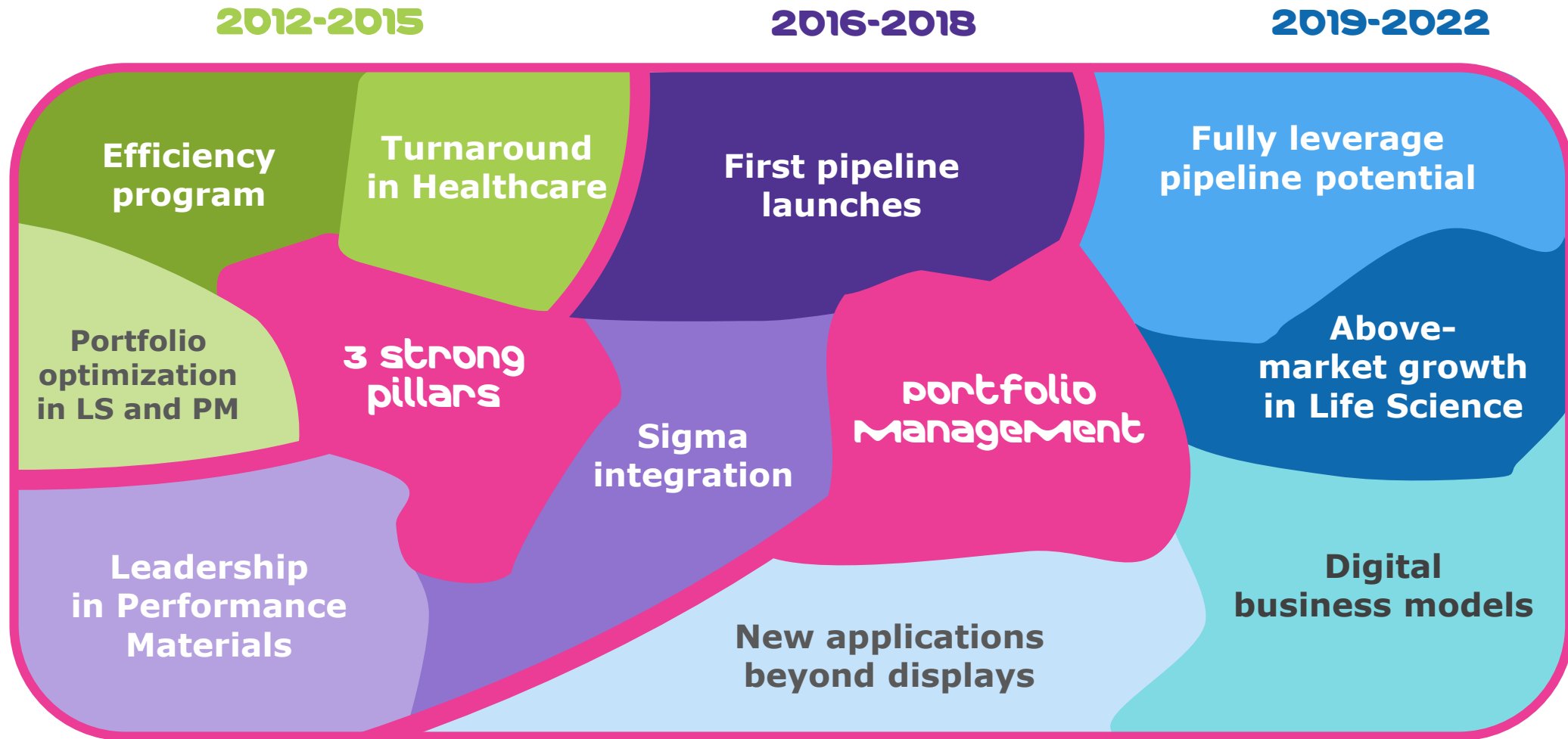


¹EBITDA pre margin in % of net sales; ²Including Corporate/Others (-€301 m)



## **02** TRANSFORMING THE COMPANY

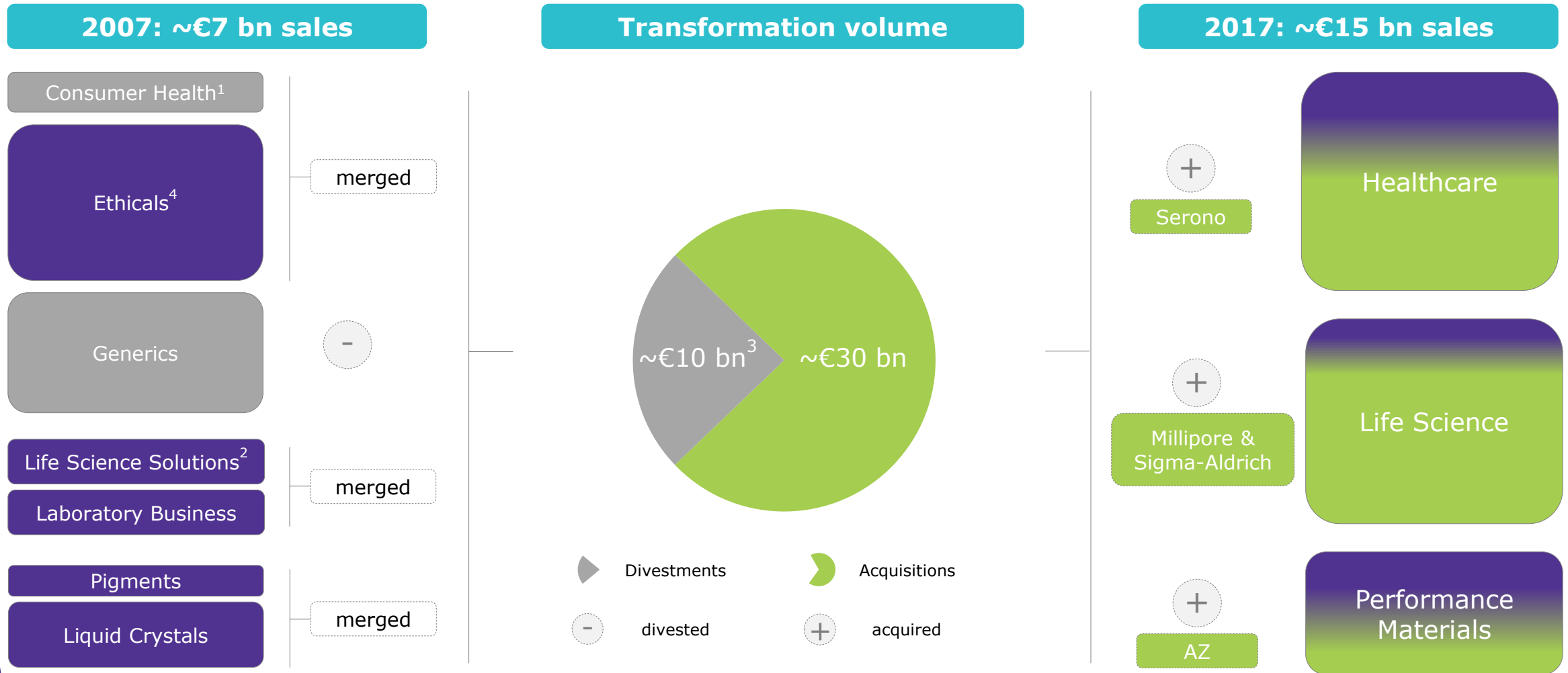
# Group Strategic roadmap 2016-2022





## Group

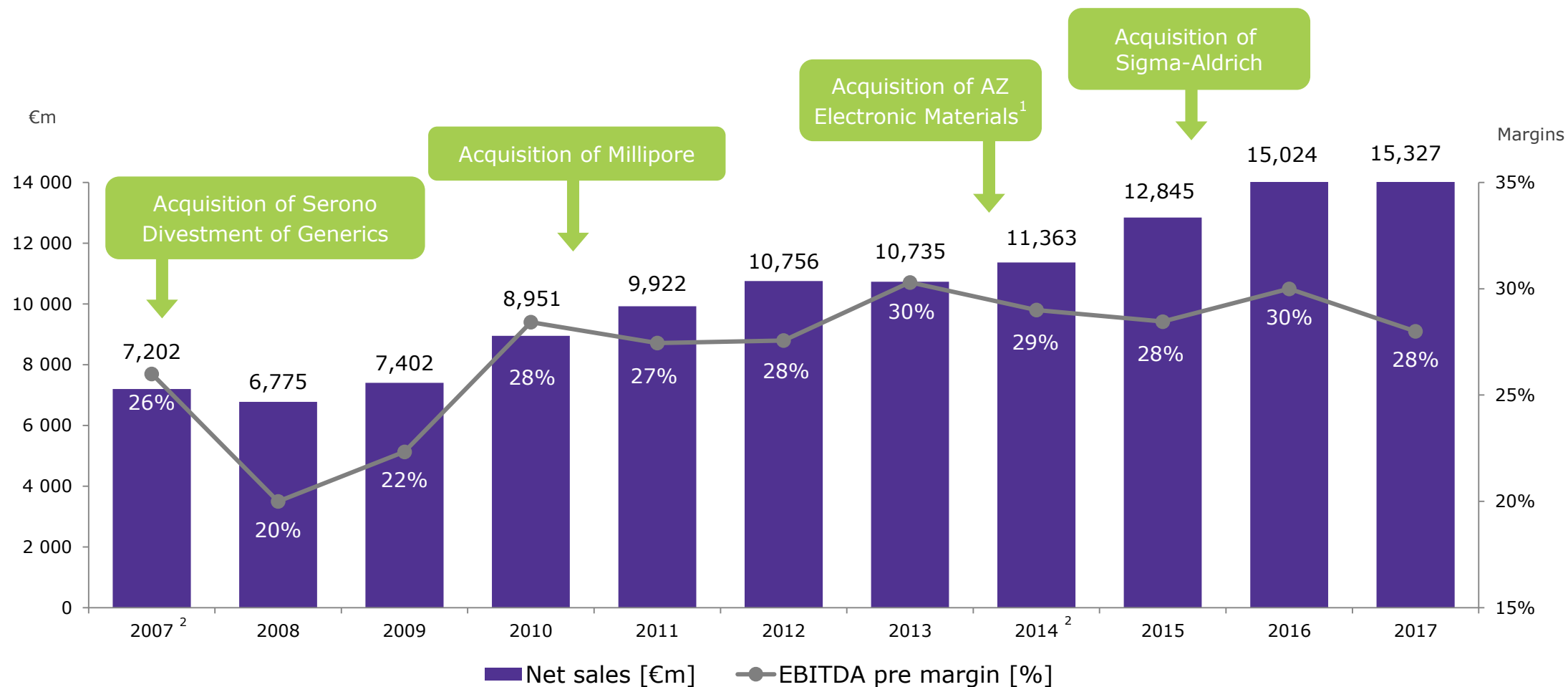
# We have added scale and strengthened the attractiveness of our portfolio



<sup>1</sup>Consumer Health divestment announced on April 19<sup>th</sup> 2018, closing expected at the end of Q4 2018; <sup>2</sup>Excluding "Crop Bioscience", which was divested; <sup>3</sup>Profroma divestment volume includes cash proceeds for Consumer Health <sup>4</sup>Excluding "Theramex", which was divested;

# Group

## Profitability improved fundamentally



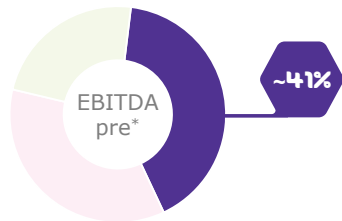
<sup>1</sup>Included since 2 May 2014; <sup>2</sup>2007 and 2014 EBITDA pre margin adjusted for comparability

## Group

# Clear set of priority goals to be realized by 2018



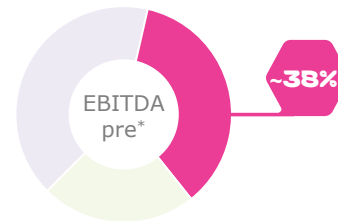
### Healthcare



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



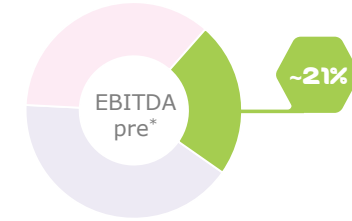
### Life science



- 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) until end of 2018 (unless financed by divestments)
- Dividend policy that ensures a sustainable and resilient development

\*based on FY 2017 reported EBITDA pre, excluding Corporate & Other

## Regular portfolio review and optimization remains key

- Acquisitions and divestments are part of our history
- Licensing transactions remain on our agenda
- All prior transactions earned their required cost of capital

---

**Regular portfolio review and active capital allocation will continue**

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**DNA and  
track  
record**

**clear  
criteria**

- Supporting mid-term strategy and strengthening core business
- Growing in attractive markets
- Proven track record: strong ability to win
- Compelling financials:
  - $IRR > WACC$
  - EPS pre accretive
  - Maintain investment-grade credit rating

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**Disciplined approach to portfolio management will persist**

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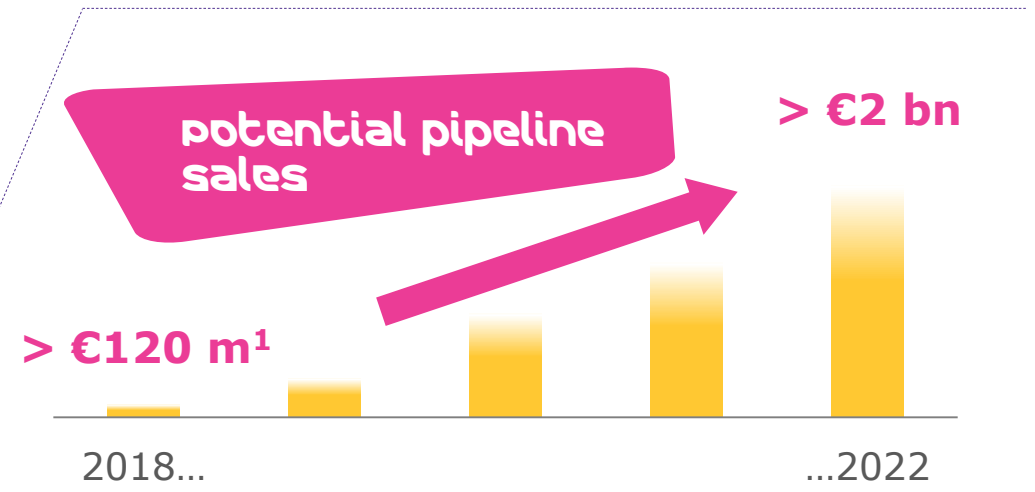
## HEALTHCARE

Funding for success

# Healthcare

## Healthcare is set to deliver on promising pipeline candidates

Focus on  
the  
pipeline



Pipeline  
products



2013



2022E

Core  
business

ERBITUX<sup>®</sup>  
CETUXIMAB

Rebif<sup>®</sup>

Glucophage<sup>®</sup>  
metformin

Euthyrox<sup>®</sup>

Concor<sup>®</sup>

saizen<sup>®</sup>  
Somatropin r-hGH

GONAL-f<sup>®</sup>  
FOLLITROPIN ALFA

Pergoveris<sup>®</sup>

OVITRELLE<sup>®</sup>  
choriogonadotropin alfa

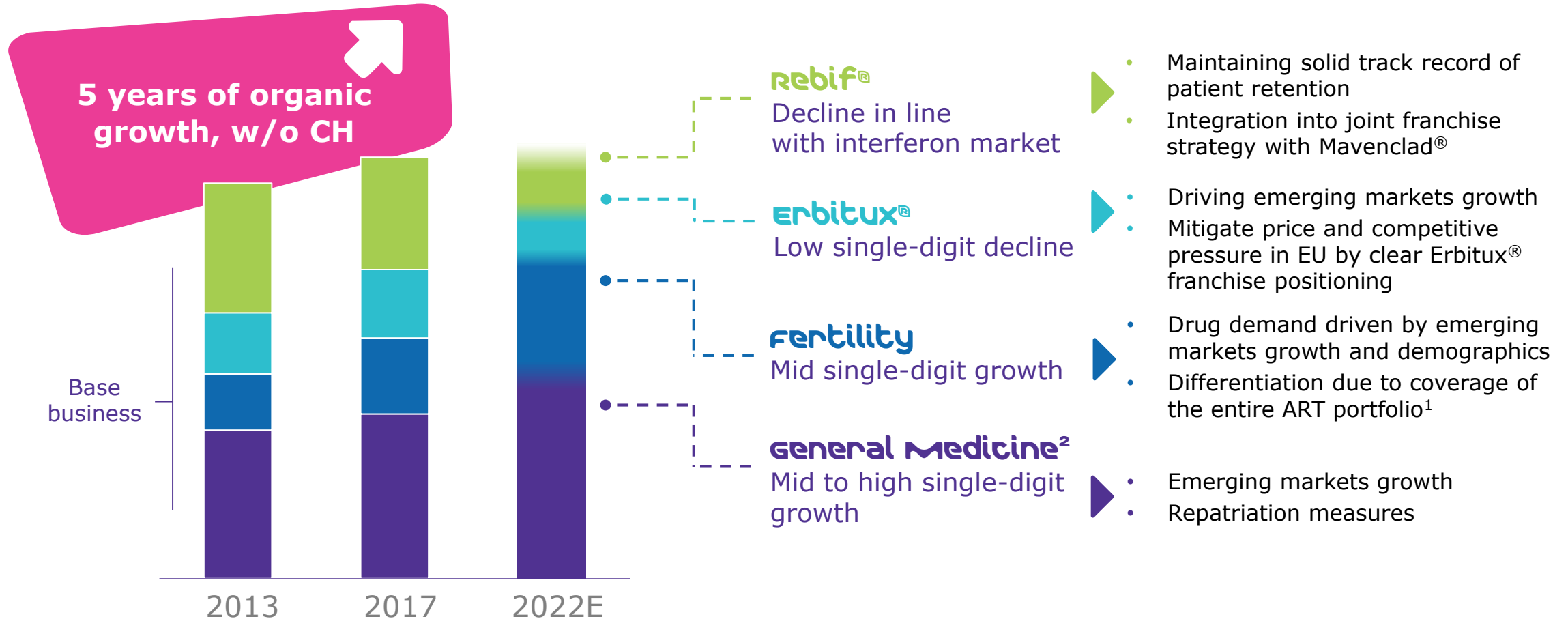
Cetrotide<sup>®</sup>  
CETRORELIN

Crinone<sup>®</sup>  
progesterone gel 8%

# Healthcare

## Ambition to keep core business sales organically stable until 2022

### Healthcare core business net sales until 2022

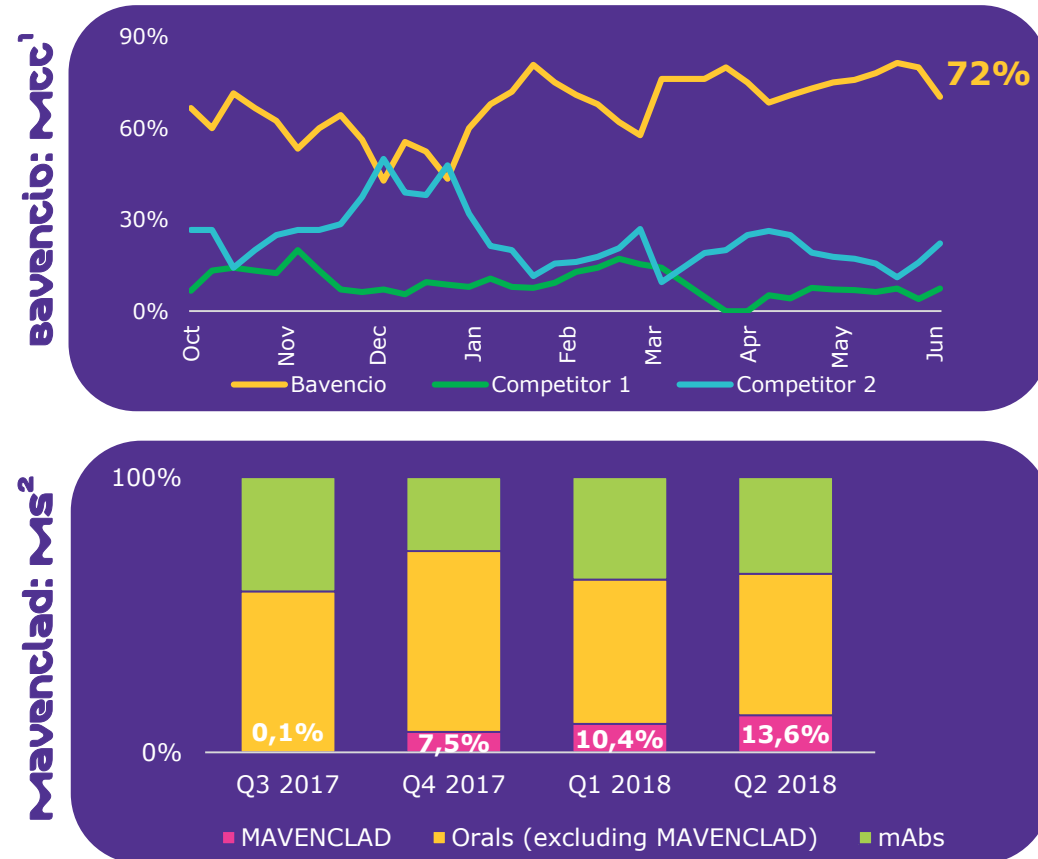


<sup>1</sup>ART: Assisted Reproductive Technology; <sup>2</sup>includes General Medicine, CardioMetabolic Care (CMC), Endocrinology & Allergopharma

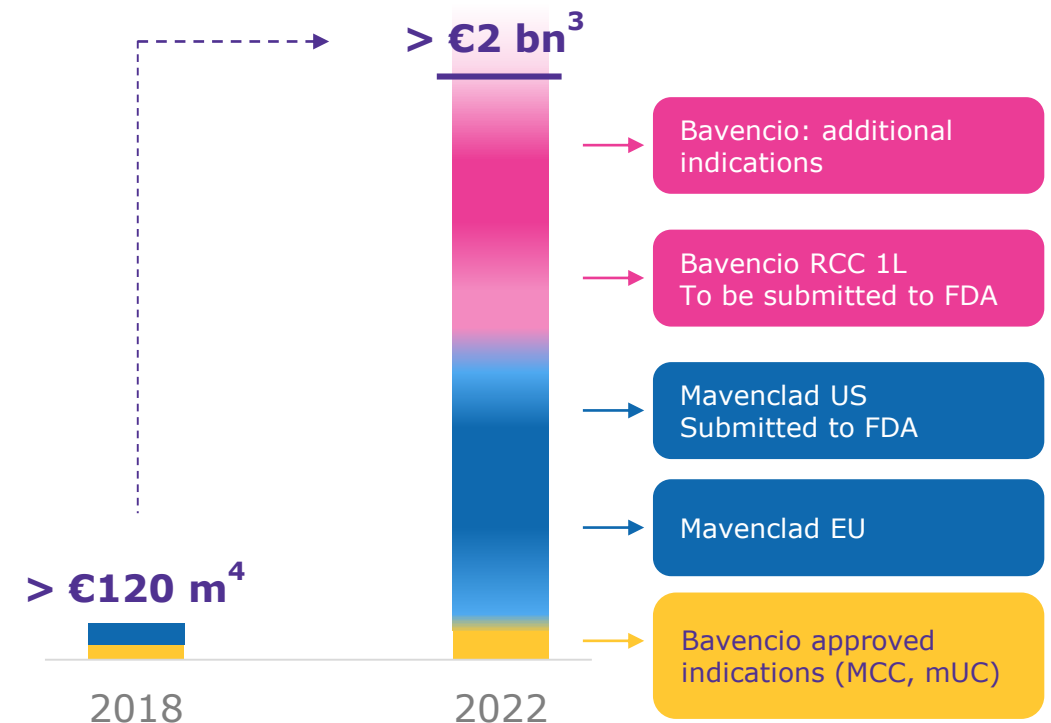
# Healthcare

## Mavenclad<sup>®</sup> and Bavencio<sup>®</sup> are growing well and support €2 bn pipeline target

Recently launched products continue to gain market traction in 2018 ...



... and support €2 bn pipeline sales ambition for 2022

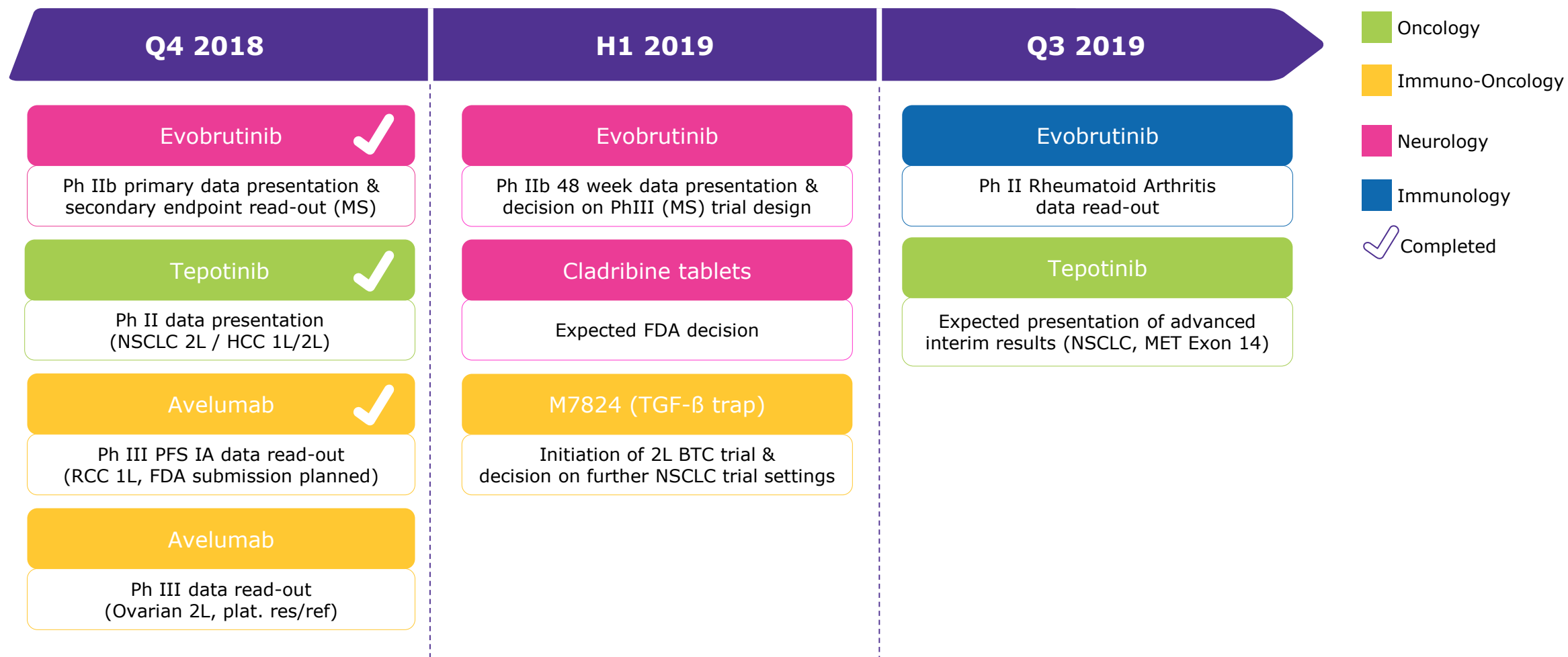


<sup>1</sup>US: naïve/1L Patient share of IO class in 2018 - Data source: IMS claims data; <sup>2</sup>Germany: share of HE dynamic patients (RMS only) - Data source: actual patients per IMS and shares estimated from IPSOS MS Monitor; Dynamic markets per internal company estimates; <sup>3</sup>Indication, risk adjusted; composition is an illustration and may change subject to data read-outs and registration outcomes; <sup>4</sup>Guidance 2018



# Recent & upcoming catalysts

## An eventful Q4 and a year of continued pipeline development ahead<sup>1</sup>



<sup>1</sup>Note: All timelines are event-driven and may be subject to change; Acronyms: NSCLC – Non small cell lung cancer | MS – Multiple Sclerosis | RCC – Renal Cell Carcinoma | HCC – Hepatocellular Carcinoma | plat. res/ref – platinum resistant/refractory | FDA – U.S. Food and Drug Administration | IA – Interim Analysis



## **LIFE SCIENCE**

Focus on profitable growth

## Life Science

### Serving customers across the highly attractive life science industry

#### RESEARCH

~€45-50 bn

Low single-digit growth



Academic and government institutions

Biopharma R&D

Industry R&D

#### PROCESS

~€50 bn

High single-digit growth



Pharmaceutical companies

Small biotech

Contract manufacturing organizations

#### APPLIED

~€55 bn

Mid single-digit growth



Diagnostic manufacturers

Clinical testing labs

Food & Beverage manufacturers

**~€150 bn\* market growing at ~4% CAGR**

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

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

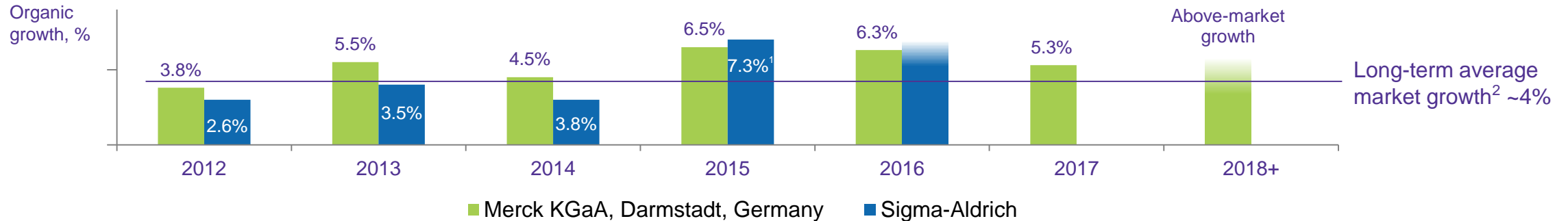
- Volume growth from
  - Population growth
  - Rise in quality standards
  - Increased testing needs

\*Source: Merck KGaA, Darmstadt, Germany estimate 2018

## 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

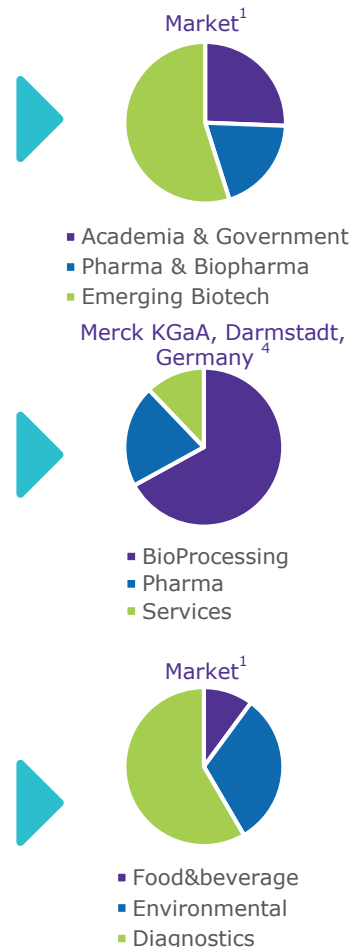
- Best in class eCommerce
- Excellent service capabilities
- Global reach

<sup>1</sup>Growth for 9M 2015 (organic growth of \$152 m on prior 9M 2014 sales of \$2,080 m); <sup>2</sup>Source: Merck KGaA, Darmstadt, Germany market intelligence and broker research

# Life Science

## Business is on track to deliver above-market organic growth

### Life Science



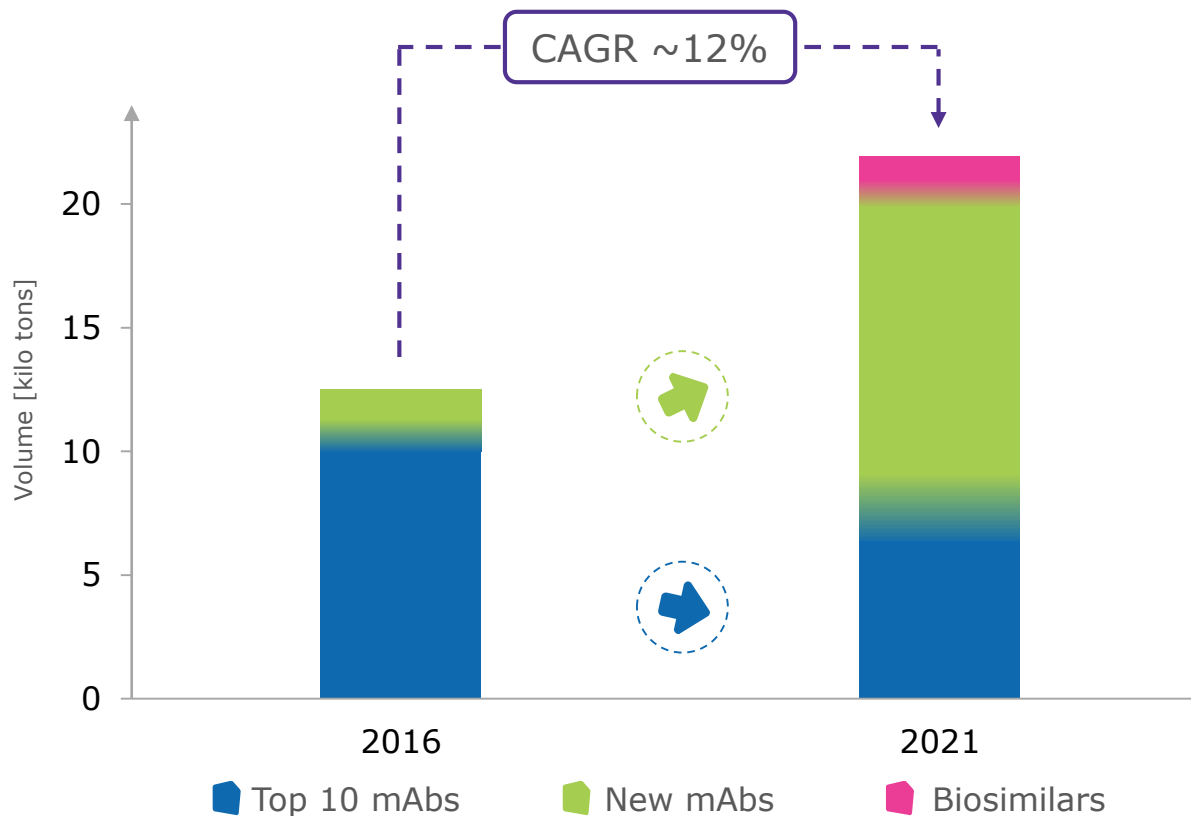
### Long-term growth drivers

- **Research activity:** >3,000 projects in research pipelines<sup>2</sup>, rising number of experiments and newly emerging therapies/technologies backs healthy growth in biotech and CROs<sup>3</sup>
  - **Public and private funding:** availability, access and predictability drive demand from academia and emerging biotech customers
  - **Regulation:** rising requirements foster long-term customer partnerships
- 
- **Biologics:** mAbs production<sup>5</sup> growing by ~12% p.a. for 2016-2021 driven by new molecules and biosimilars
  - **Diversification:** contribution by top 10 molecules will decline to ~30% until 2021 from 80% today<sup>6</sup>
  - **Noval modalities:** innovation in complex-to-deliver therapies, e.g. gene and cell therapy, will drive demand for single-use, end-to-end and new technology solutions
- 
- **Regulation:** testing volumes overall are rising globally rise in quality standards and increased demand for testing across customer segments
  - **Population and economic growth:** demand for access to more sophisticated products and services rises, e.g. in emerging markets
  - **Speed:** need for fast testing results raises requirements for Applied customers, esp. in clinical testing and food & beverage testing

<sup>1</sup>Source: Merck KGaA, Darmstadt, Germany Factbook; <sup>2</sup>Source: PhRMA; <sup>3</sup>CRO = Contract Research Organization; <sup>4</sup>Indicative only; <sup>5</sup>mAbs = monoclonal antibodies; <sup>6</sup>Source: EvaluatePharma April 2017

## Democratization of mAbs market will drive diversification, change, variability

### mAb volume projections 2016 to 2021



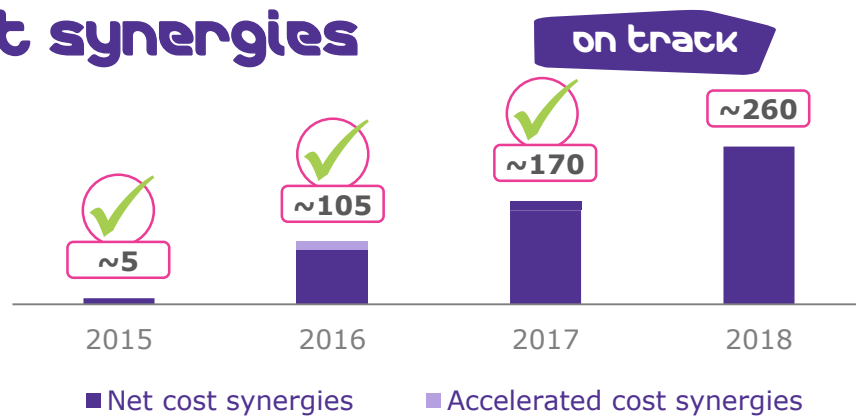
### Market development

- Overall mAbs market will grow ~12% CAGR
- Top 10 originator mAbs represent ~80% of market volume
- In 2021 ~90% of the volume will be shared between Top 35 mAbs
- Biosimilars will gain share, but remain a minority mid-term

## Integration of Sigma and synergy generation progressing well

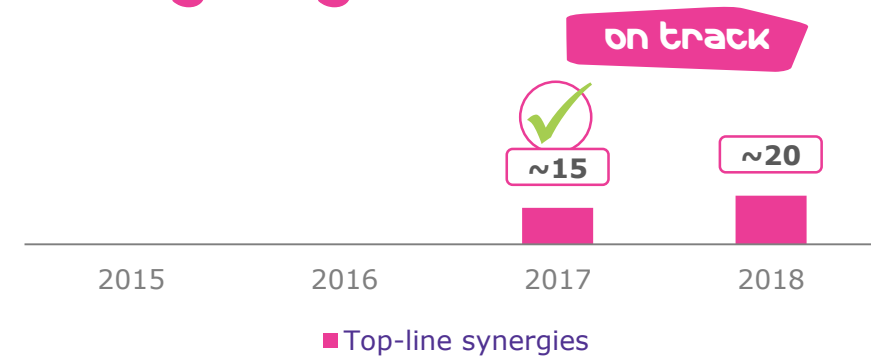
on track to deliver planned synergies of ~ €280 M until 2018

### cost synergies



- **Network consolidation and operational transformation ongoing**
  - Consolidated 10 manufacturing and distribution sites
  - Announced consolidation of 5 further sites
- **Combination of customer service centers and offshoring of transactional tasks**

### topline synergies



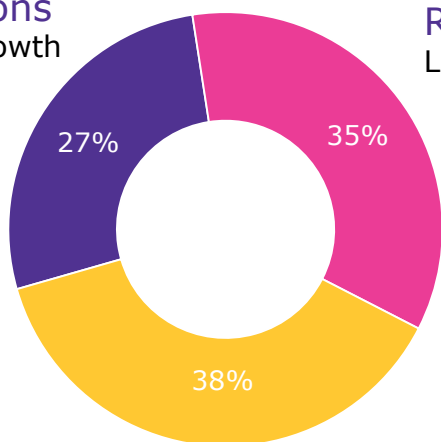
- **Continued integration of sigmaaldrich.com**
  - ~80% of relevant products in U.S. and EU are available online
  - >1/3 of Merck KGaA, Darmstadt, Germany eCommerce orders now contain products from both legacy companies
- **Complete offering in Process Solutions**

## Life Science

**We aim to be the profitability champion of the sector**

### Sales breakdown as of FY 2017

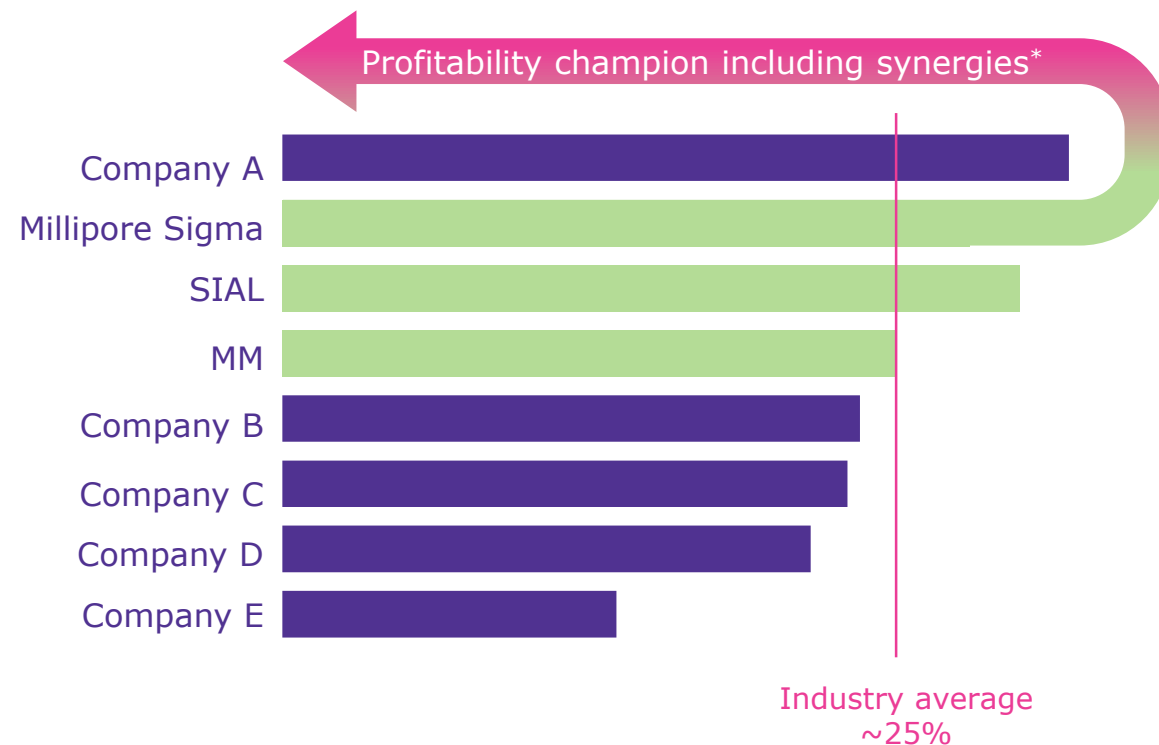
Applied Solutions  
Mid single digit growth



Research Solutions  
Low single digit growth

Process Solutions  
High single digit growth

### Above industry margin levels



**Life Science is well set for sustainable growth and profitability**

\*Pro-forma combination based on 2015 financials including 100% of targeted synergies





05

## **PERFORMANCE MATERIALS**

Maintaining leadership and innovation

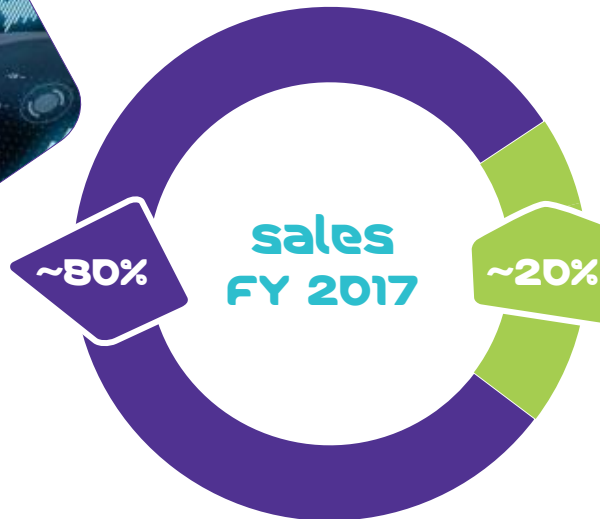
# Performance Materials targets attractive markets – especially in the electronics space

Market



- Driven by digital disruptions and megatrends such as digitalization
- Heterogeneous end-user applications
- Semiconductors as the engine of all electronic systems

## Performance Materials sales by end market



- Driven by world GDP growth
- Increasing demand in emerging markets



- Driven by world GDP growth
- Rising living standards and higher disposable income

Source: McClean 2018/IC Insights 2017, Gartner 2017, Prismark 2018, Statista 2016  
Abbreviation: CAGR = Compound annual growth rate; GDP = Gross domestic product

# Performance Materials

## A leader in the electronic materials market

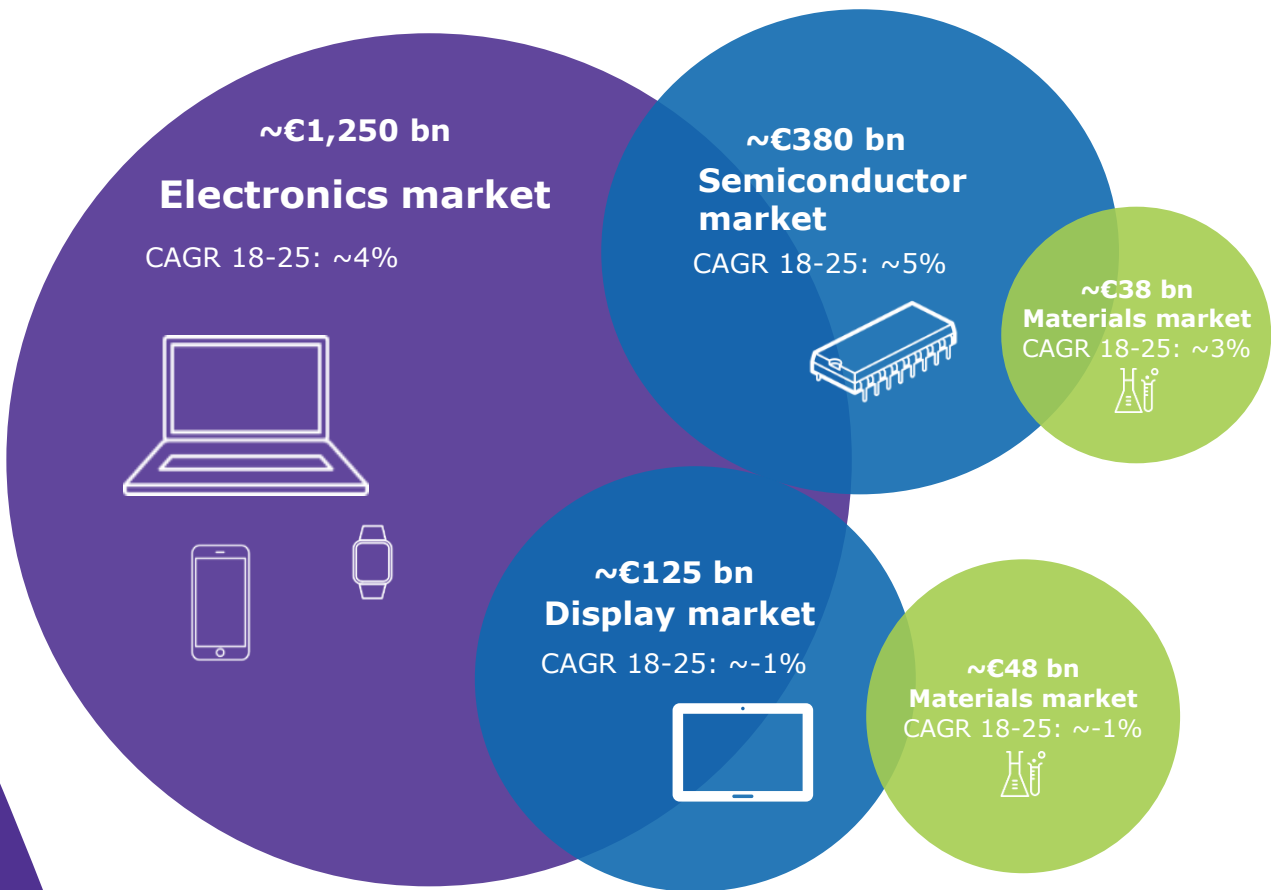
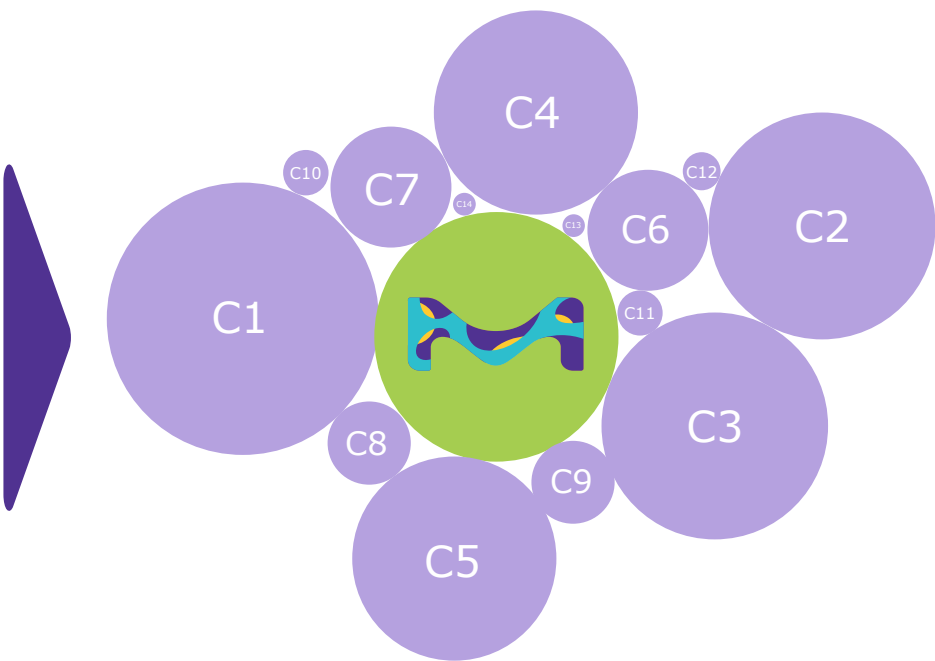


Illustration of the electronics market and thereof its selected sub markets

### Electronic materials competitor landscape<sup>1</sup>



<sup>1</sup>Bubble size in competitive landscape illustrates share of semiconductor and display material sales of indicated competitors (C1 – C14)

<sup>1</sup>Source: Linx 2018, Research & Markets 2017, Semi 2015, McClean/IC Insights 2018, IC insights, Gartner 2017, Prismark 2018, FujiChimera, IHS, Market size as of 2017

# Performance Materials

## Three pillars are set for future profitable growth



% sales



Products

- Dielectrics, colloidal silica, lithography materials, yield enhancers, edge-bead removers
- Polyimide raw materials and printing materials



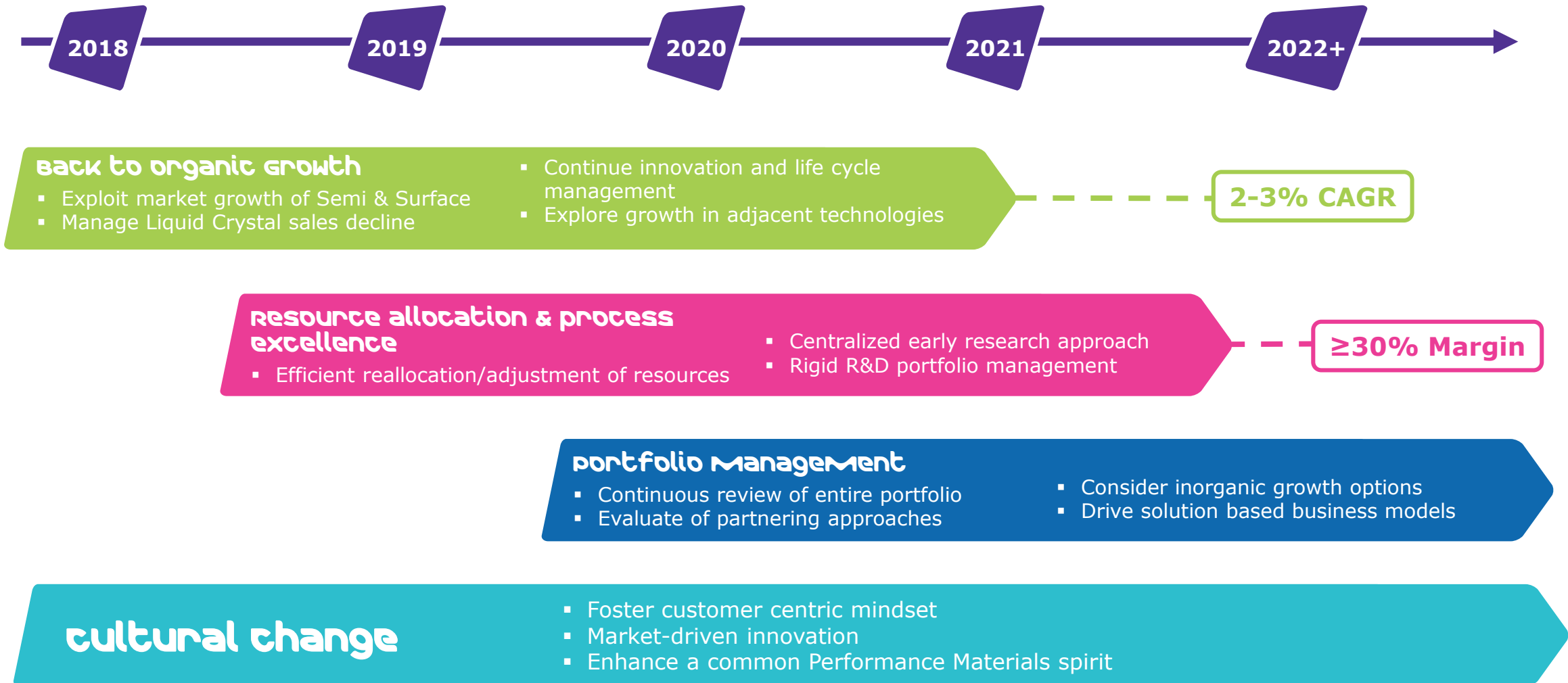
- Liquid crystals (LC) and photoresists for TVs, smartphones and tablet computers
- Other display and non-display applications (e.g. LC Windows)
- Organic light emitting diodes



- Effect pigments and functional materials for coatings, plastics, printing and cosmetics
- Functional solutions for cosmetics & special applications
- Functional solutions for electronics and energy solutions

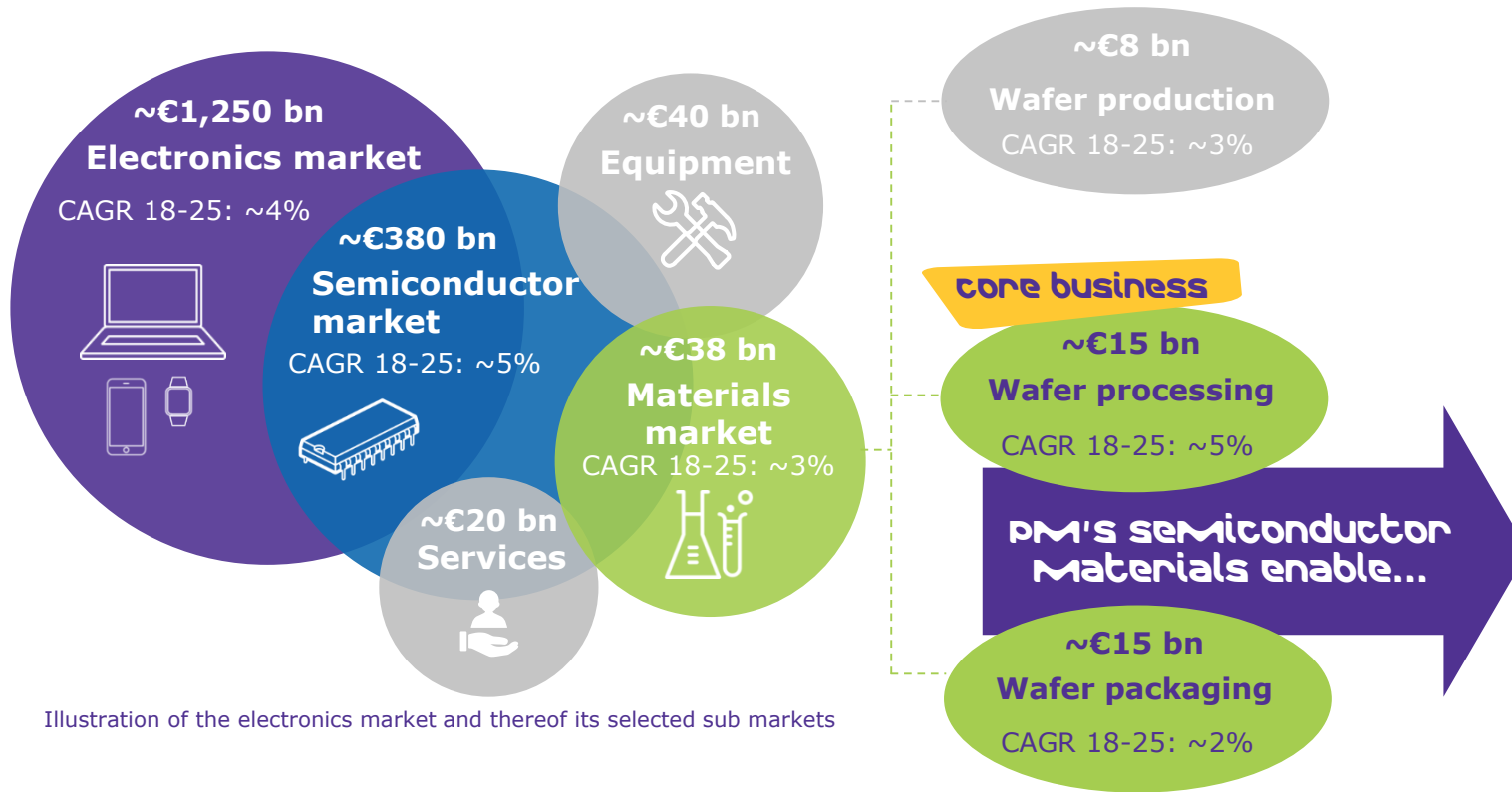
## Performance Materials

### 5-year transformation program to drive long-term performance



# Semiconductor Solutions products - key enabler for digital trends

semiconductor



## ...customer needs

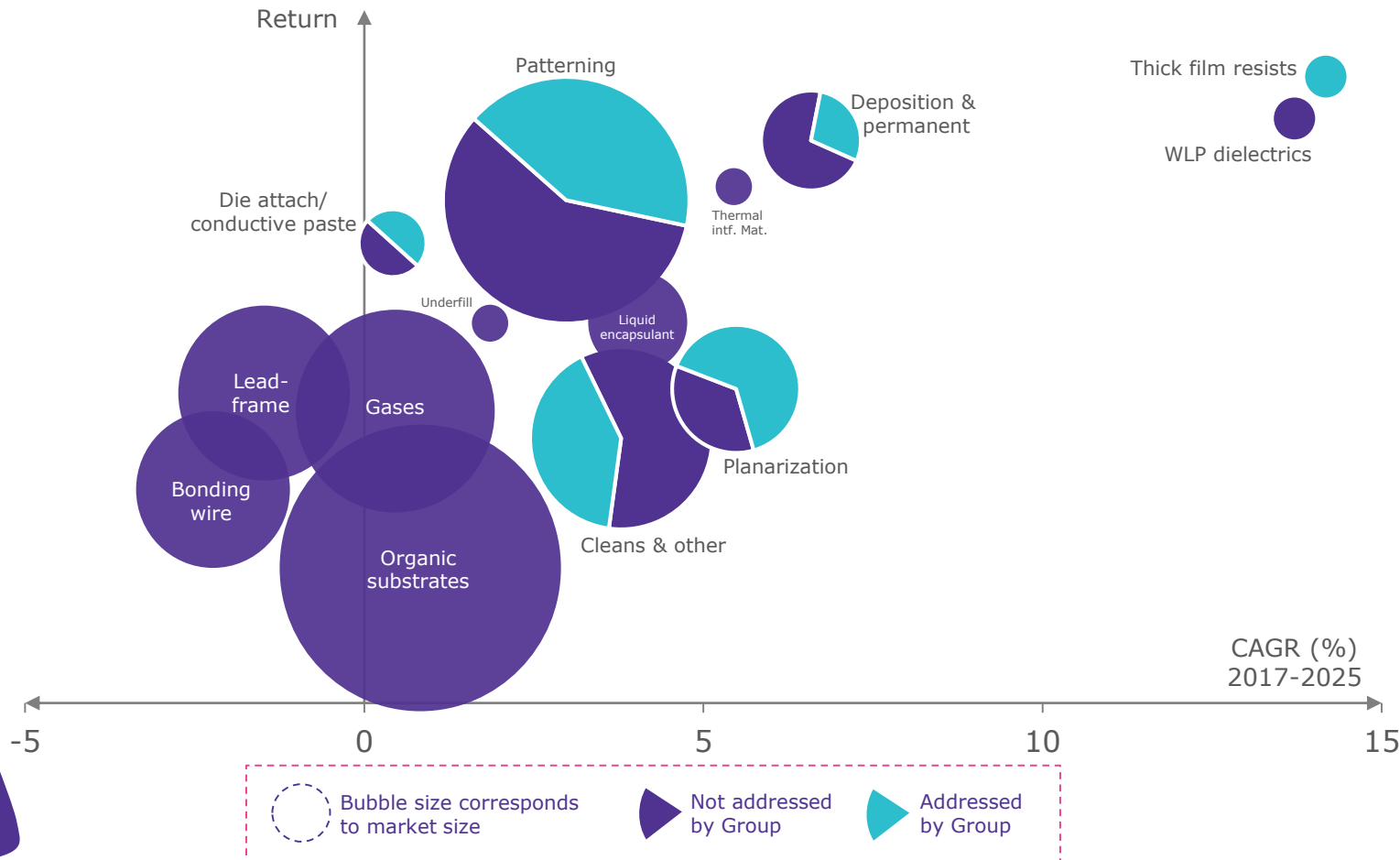
- Smaller structures beyond limitations of existing technologies
- Higher memory capacity, faster processing speed, less power consumption
- Improved yield and lower processing costs

**Performance enhancing materials will benefit over-proportionately from attractive semiconductor growth rate of 5% CAGR**

# Semiconductor Solutions is well positioned in highly attractive market segments

semiconductor

## Market landscape of wafer processing and packaging materials



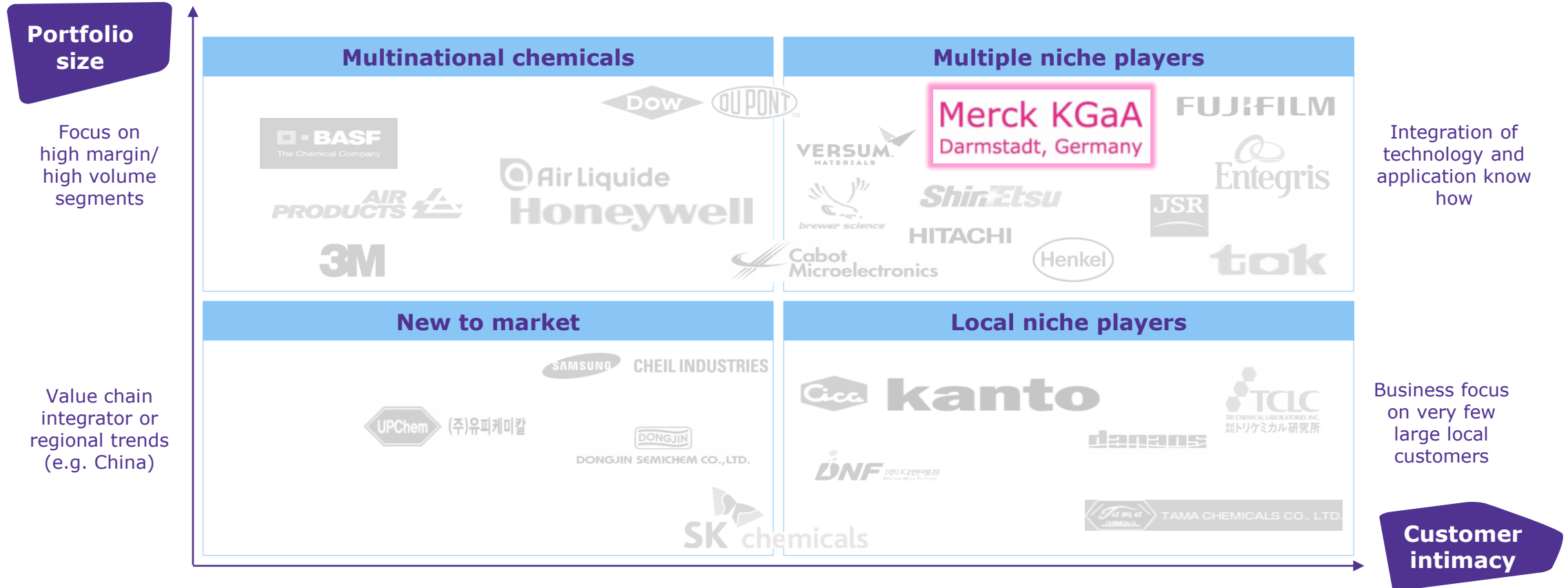
### Market positioning

- Positioned in attractive sub-segments
- Focus on enabling material solutions with small part in bill of materials
- Address innovative technologies through collaborative R&D
- Above-market growth
- Opportunities to increase footprint

Illustration;  
Abbreviation: WLP Dielectrics = Wafer Level Packaging Dielectrics

# Semiconductor Solutions faces four types of competitors in market

semiconductor



**Solution provider in attractive niches – within these niches, number and size of competitors vary a lot, which creates a large competitor landscape**



# Semiconductor Solutions is market-leader in crucial areas

semiconductor

## Market requirements



### customer intimacy



### solutions



### speed



### quality

## semi-conductor solutions

- >30 years of experience
- Strategic partnerships
- Dedicated KAM
- Preferred partner for tool manufacturers

- Enabling solutions for smaller structures and 3D chip architecture
- Material pipeline filled with customer-relevant ideas
- Close cooperation and technical support

- First mover strategy for leading edge accounts
- Strong focus on customer-centric product life cycle management

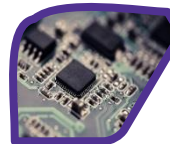
- Proven track record of reliability
- Local support centers
- Deep understanding of critical production processes

## Leading market positions



### Deposition

#1 market leader



### Spin-on dielectrics

#1 market leader



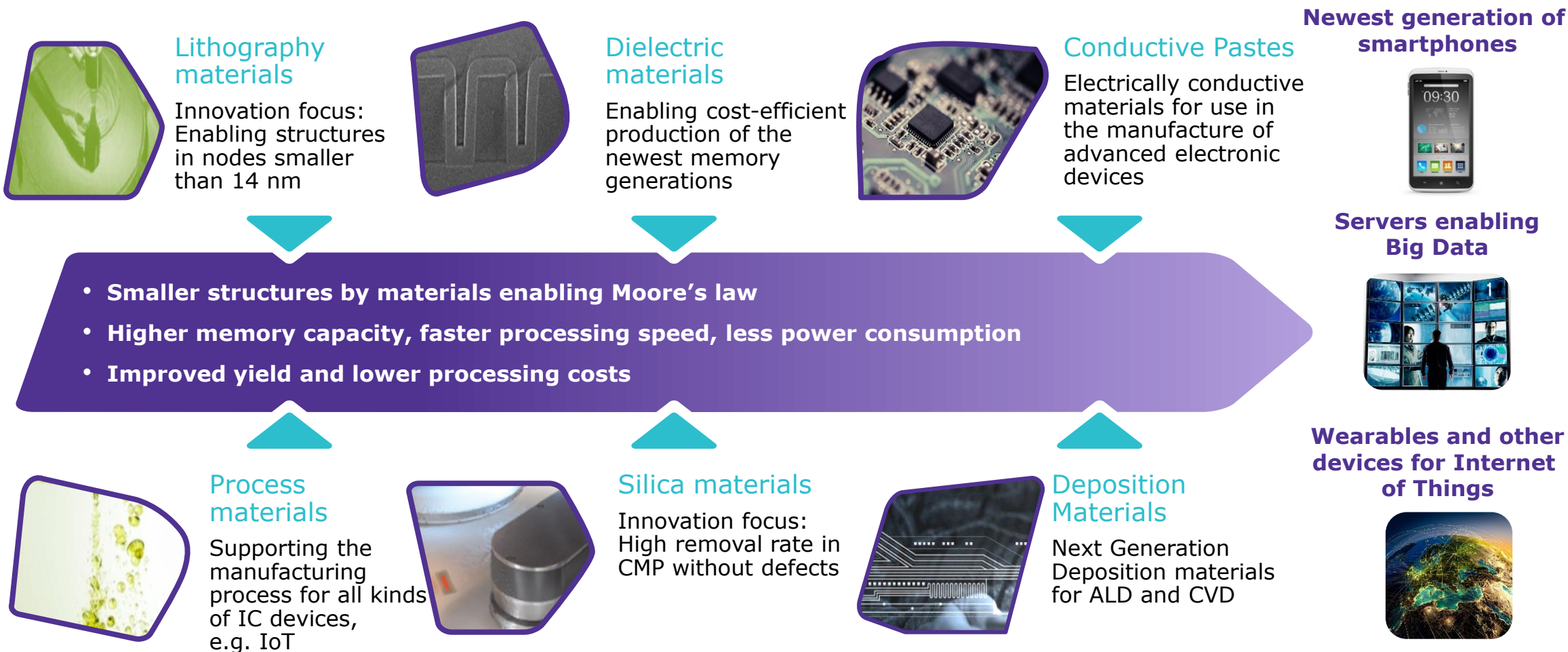
### CMP Slurries

Top 3<sup>1</sup>

Abbreviation: KAM = Key Account Management, CMP = Chemical Mechanical Planarization;

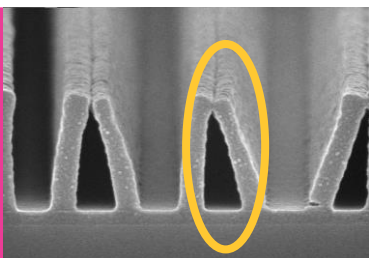
<sup>1</sup>Corresponds to Merck KGaA, Darmstadt, Germany joint business with partners

# Enabler of key technology trends

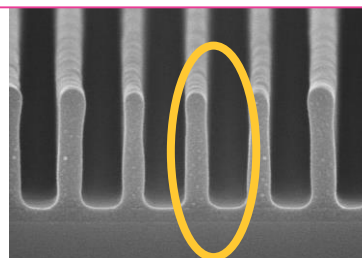


# Semiconductor Solutions develops dedicated solutions for customer challenges, enabling cutting edge innovation

## Pattern collapse

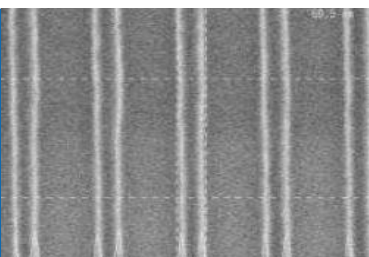


## Firm® rinse materials

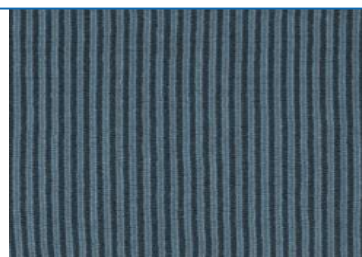


- As lines get narrower and closer together in advanced chip generation, they tend to “stick” due to surface tension.

## Lithography limitation

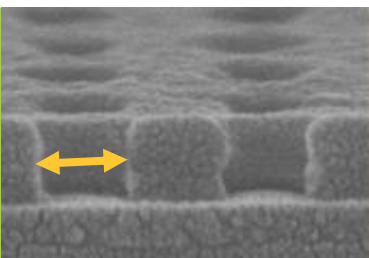


## Directed self assembly (DSA)

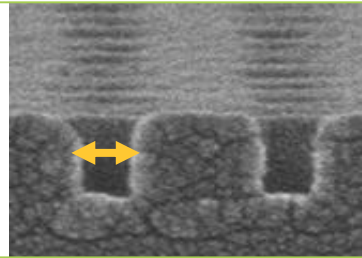


- Block Copolymer can generate small lines or contact holes by self-assembly. This allows miniaturization without expensive new equipment.

## Wide features



## Relacs® shrink materials



- Shrink materials “shrink” the gap between lines and, hence, allow the manufacture of narrower features otherwise not possible

# Overcoming technology barriers – supporting continued progression of technological mega 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

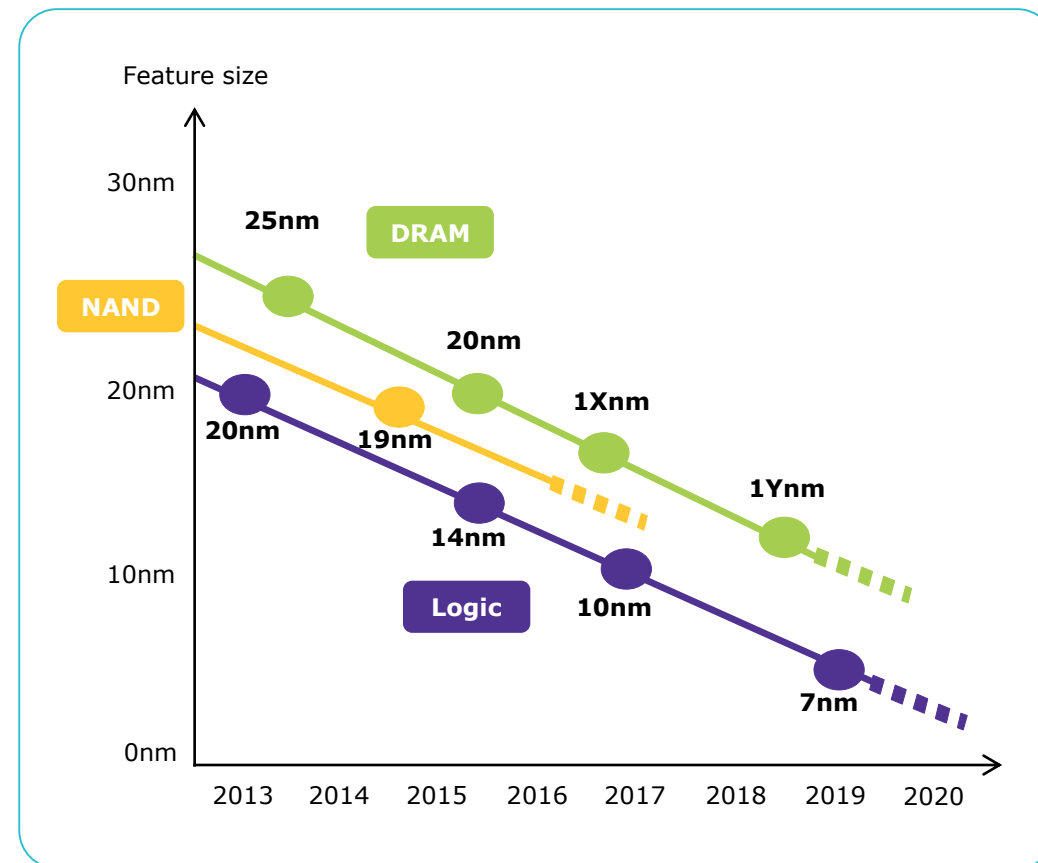
**Big Data:** Increasing need for intelligent data storage

- 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



# Display solutions offers a healthy portfolio in maturing and growth markets

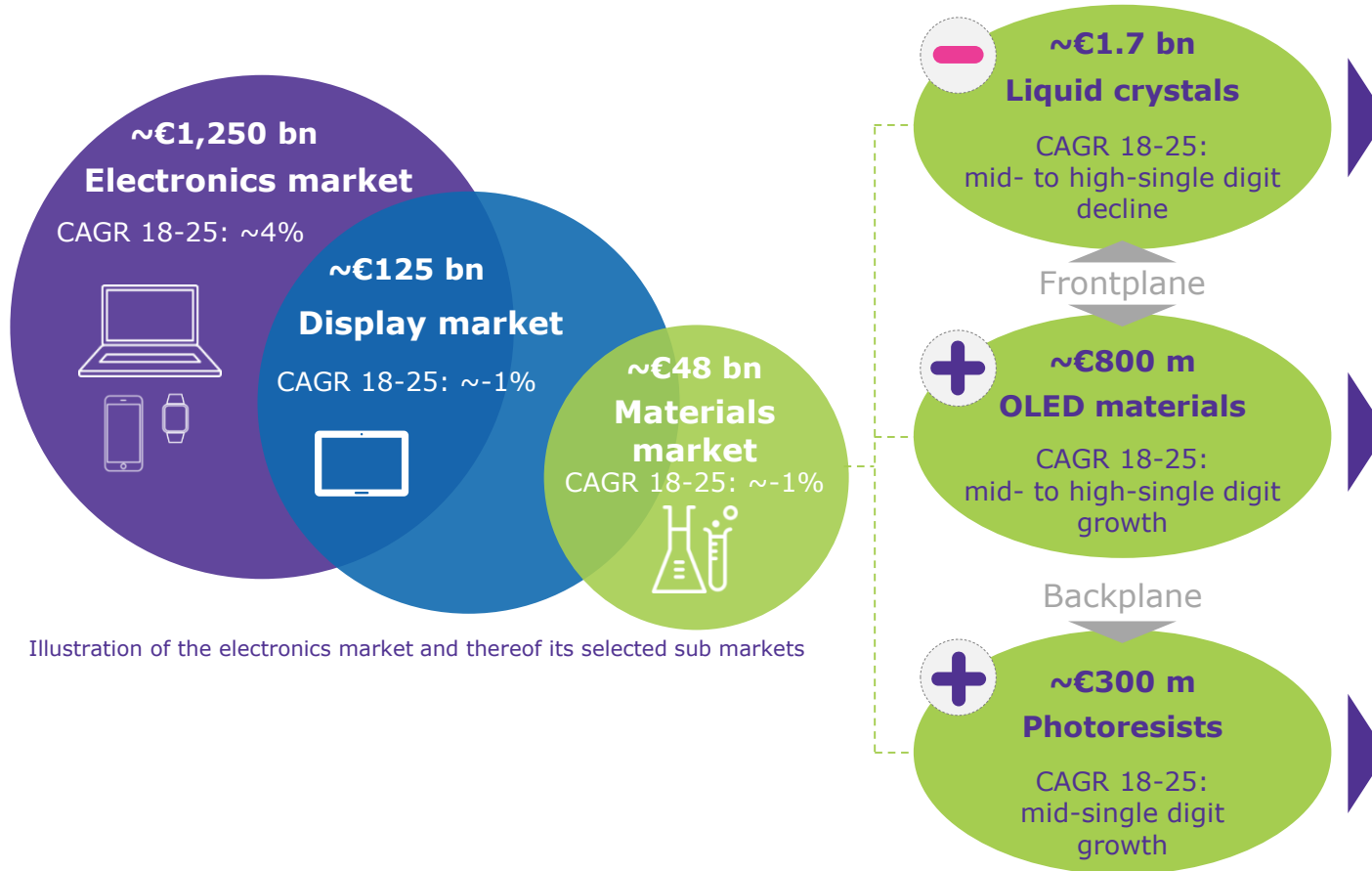
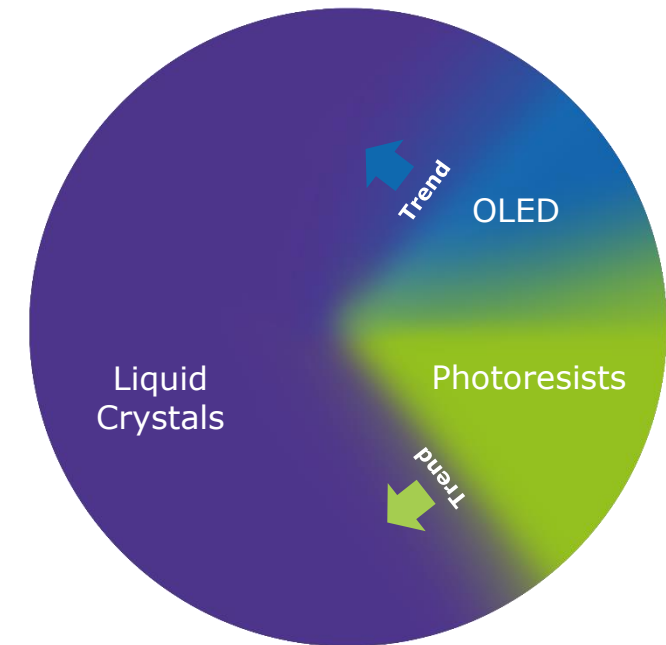


Illustration of the electronics market and thereof its selected sub markets

## Display Solutions sales split and trend

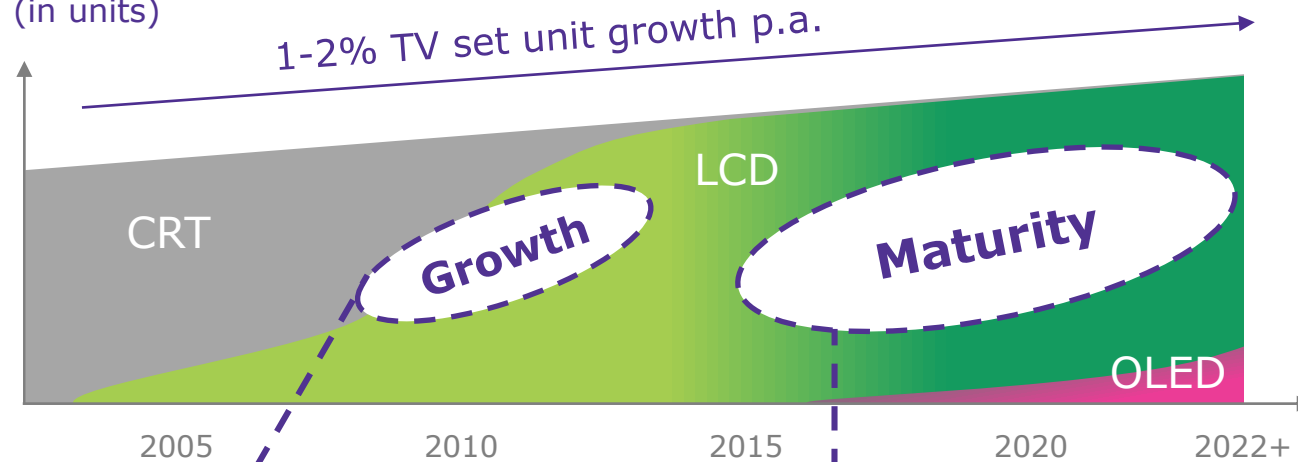


**Slower volume growth amid ongoing price decrease drives LC market decline of mid- to high-single digit CAGR**

# Maturing LC business continues to be highly attractive

## TV set shipment development

(in units)



### Impact on us:

- Vol. growth > price decline
- Innovation driven
- Limited competition
- Diverse customers

### Impact on us:

- Vol. growth < price decline
- Longer product life cycles
- Increasing competition
- Consolidation of customers

## strategy – Managing Maturity

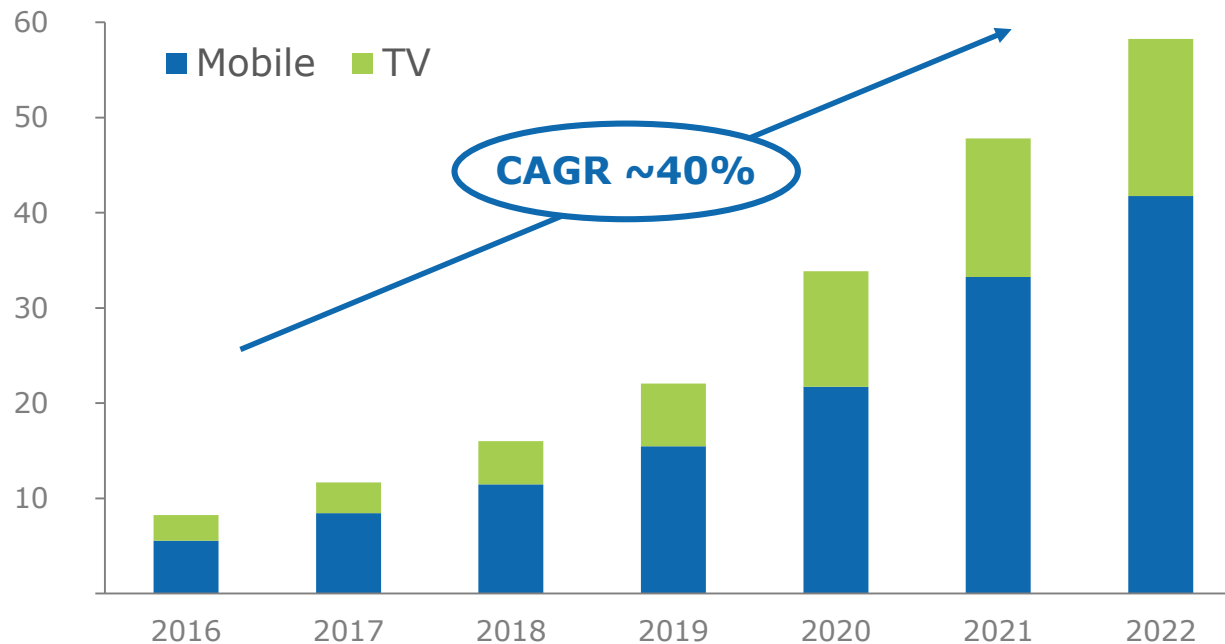
### Liquid Crystals

- Strengthening footprint in China given strong capacity shift
  - LC application lab in China
  - Dedicated resources
- Focus on relevant innovation and specific customer needs
  - Cost effectiveness (SA-VA)
  - Performance enhancement (UBplus)
  - New capacity ramp-up optimization (Service)
- Shift from top-line to bottom-line management

**Performance Materials is the best owner of Liquid Crystals, which remains one of the most cash generative businesses within the Group**

# OLED Materials and Photoresists are set to capture market growth

Announced OLED capacity expansion,  
[km<sup>2</sup>]\*



## strategy – capturing growth OLED

- Build on leading positions, established customers, application know-how & IP
- Expand into further stack layers
- Exploit market opportunities in China
  - OLED application lab in China

## strategy – capturing growth Photoresists

- Leverage customer access to expand into other backplane process steps
- Maintain leading market position

Source : IHS amoled and lcd supply demand equipment tracker Q1 '18; \*Capacity estimation based on 100% utilization and 100% yield;  
Abbreviation: IP = Intellectual property

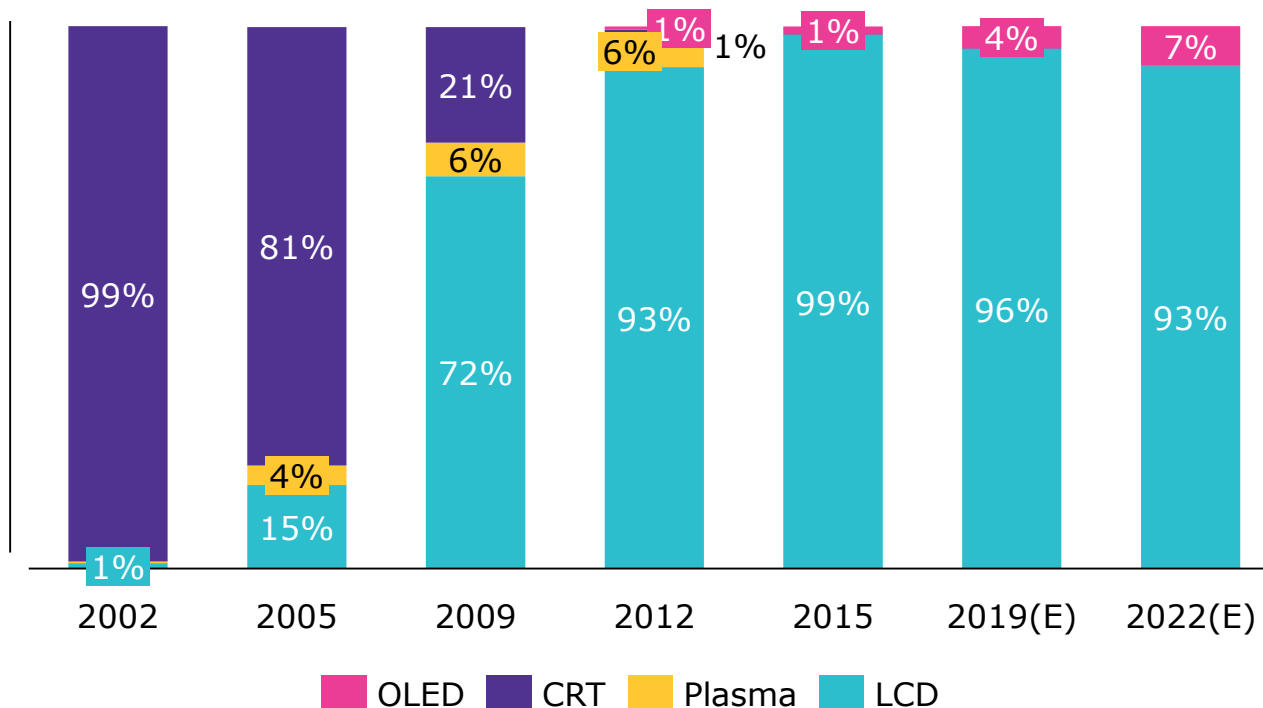


# Display Solutions

## Liquid crystals are clearly the dominant display technology

### Market share by display technology

Relative display  
surface area



### 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 TV and mobile applications**



# Display Solutions remains partner of choice for the display industry

display

Market  
requirements



customer  
intimacy



solutions



speed



quality

display  
solutions

- Pioneer within the display materials industry
- Present in all relevant customer locations
- Long relationships with all panel manufacturers

- Long-term R&D collaborations drive enabling innovations
- We enabled all LC display technologies

- Effective feedback cycles via local centers
- Modern, highly efficient and flexible production

- High-end on-site analytics
- Direct tests in device enable end-to-end quality control

Leading  
Market  
positions



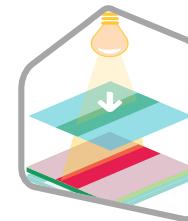
**Liquid Crystals**

**#1 market leader  
and pioneer**



**OLED**

**Top 3**

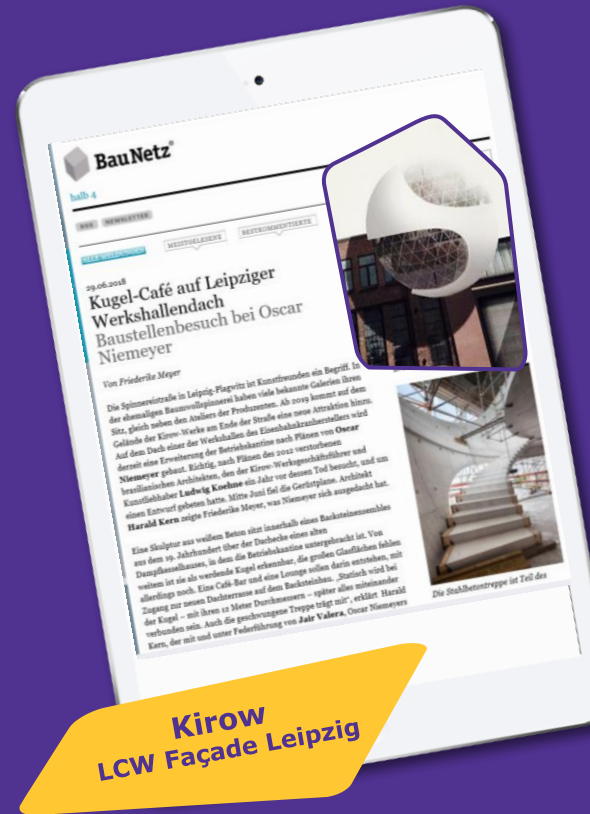


**Photoresists**

**#1 market leader**

# LIQUID CRYSTAL WINDOWS – APPLICATIONS BEYOND DISPLAYS

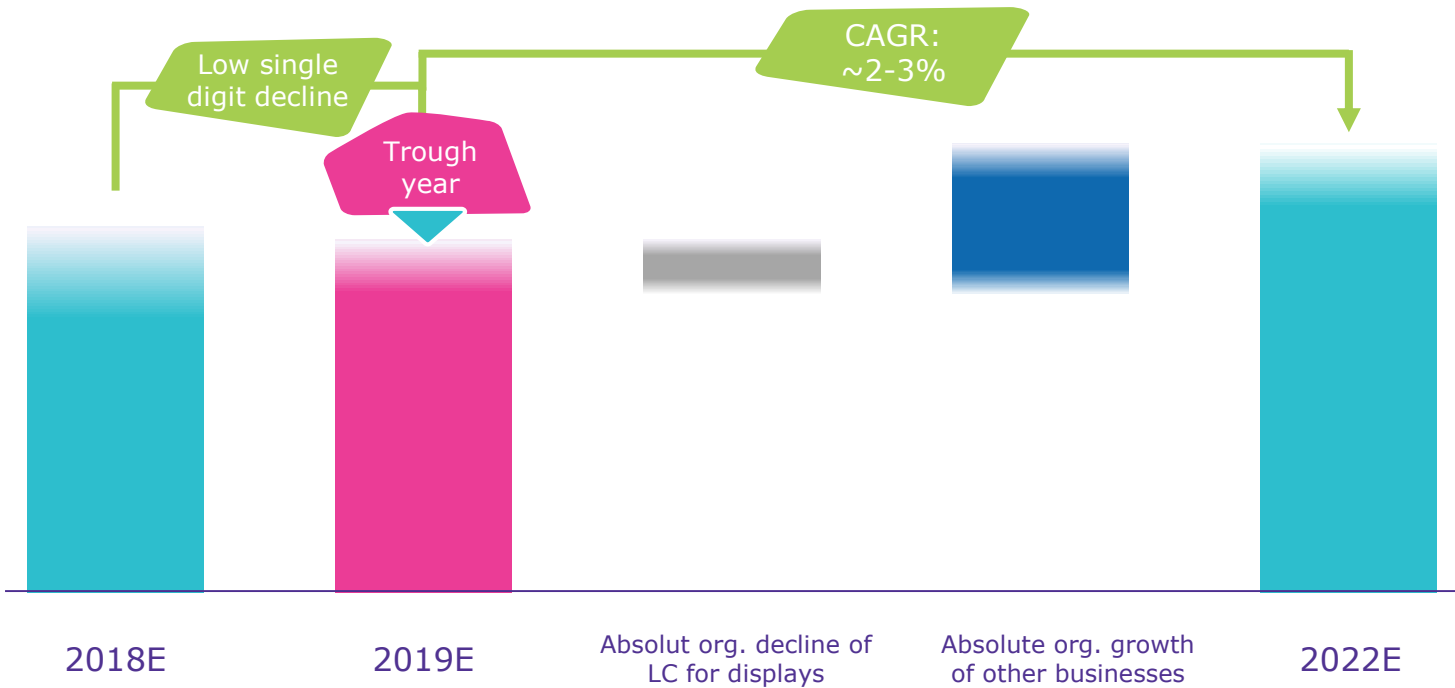
- 1 Ramp-up of production in Veldhoven (NL) on track**
- 2 2 selected highlights from the 2018 LCW project pipeline**
- 3 Superior specifications in switching time, color and shape to differentiate in solar control applications**



# Performance Materials

## Performance Materials will return to sales growth after 2019

Performance Materials sales development, in €m



2019-2022 sales growth trajectory

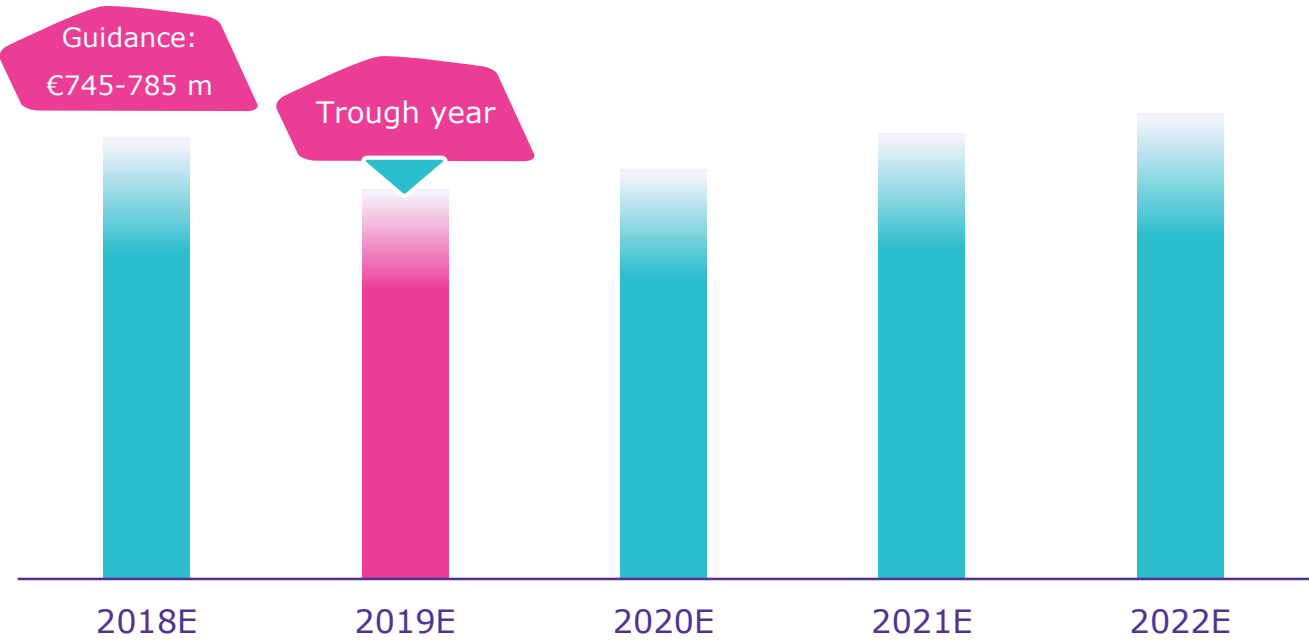


**After 2019 sales growth of Semiconductor & Surface Solutions, OLED and Photoresists will overcompensate the decline of Liquid Crystals for displays**

# Performance Materials

## Positive sales development drives earnings growth after 2019

EBITDA pre development



### EBITDA pre development

After 2019, EBITDA pre will grow due to positive sales development

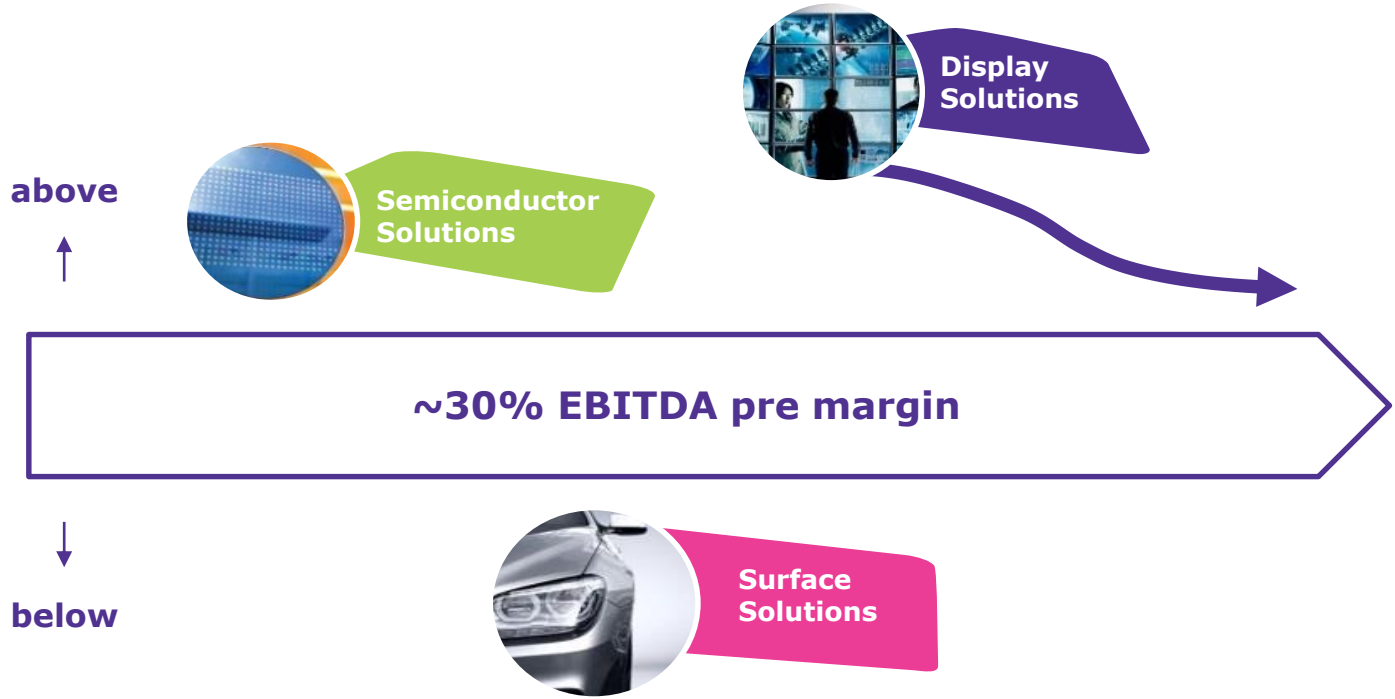
Semiconductor & Surface Solutions will overcompensate for Display Solutions EBITDA decline after 2019

Performance Materials  
**Margins of PM will remain around 30% in the long-run**

**profitability indication**

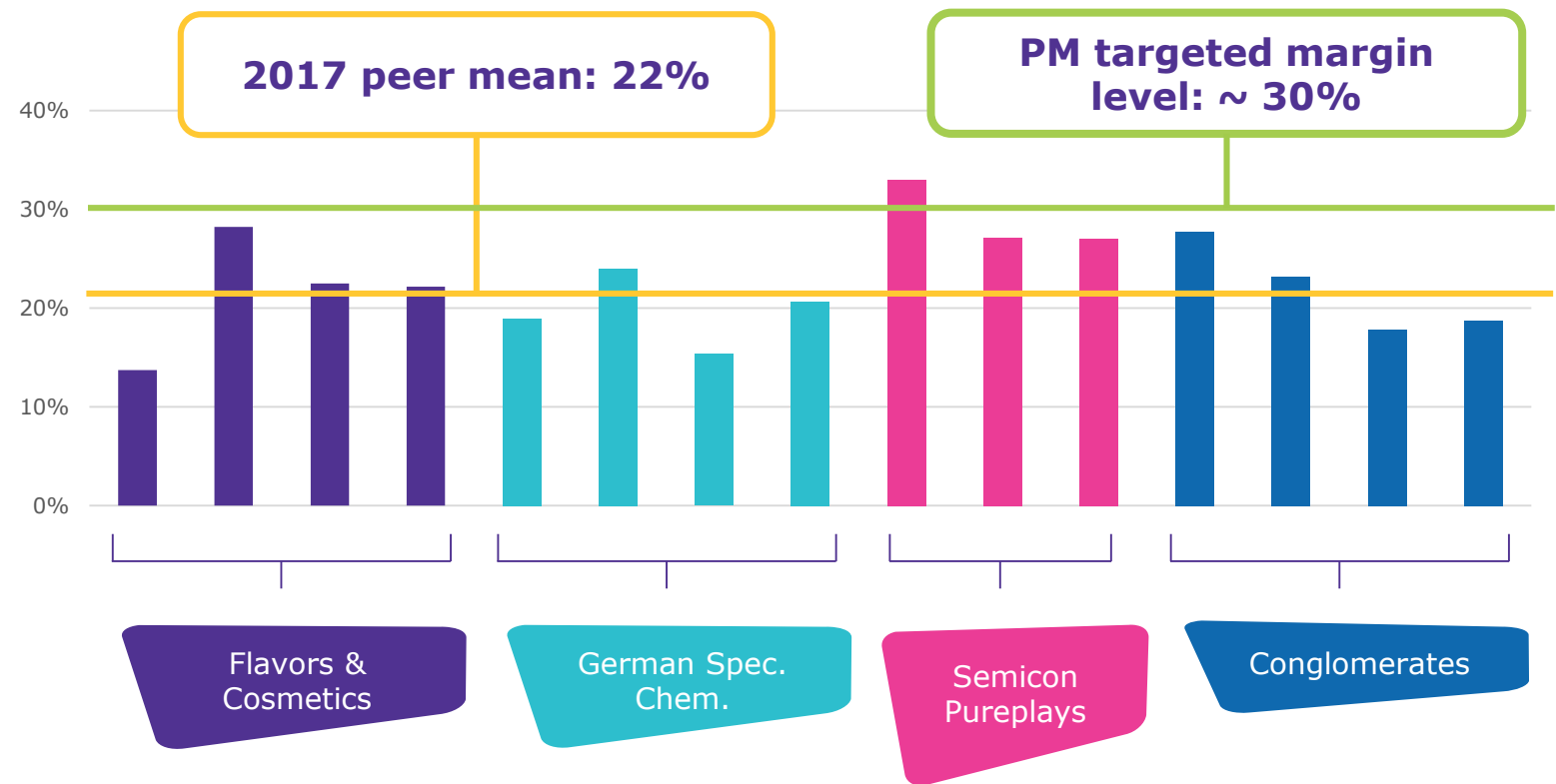
- Display Solutions will adjust towards PM average margin
- Bottom-line management to support margin
- Strong FX exposure will cause fluctuations

EBITDA pre margin indication by business



# Performance Materials margins significantly above industry average

2017 EBITDA margins of various peer groups



## Peer benchmark

- Extraordinary situation of past years is adjusting
- Future profitability will remain very attractive compared to specialty chemicals
- Benchmarks well against several peer groups

Profitability will remain above specialty chemicals average

## Executive summary



**Semiconductor Solutions is a key enabler for digital trends**



**Long-term sales growth projected in the mid to high single digits**



**Solution provider in highly attractive market segments**



**Highly valuable pillar within Performance Materials**





06

## EXECUTIVE SUMMARY AND GUIDANCE



# Key EBITDA pre\* drivers



## EBITDA-supporting factors

- Organic net sales growth by Healthcare and Life Science
- Sigma-Aldrich incremental cost and revenue synergies  
~+€95 m YoY
- Biosimilars divestment frees up R&D budget  
(2017: mid to high double-digit million R&D costs)
- First full-year sales contribution from newly launched pipeline products Mavenclad® and Bavencio®
- BioMarin milestone payment of €50 m



## EBITDA-reducing factors

- Underlying R&D costs in Healthcare are budgeted above 2017, but actual development will be subject to clinical data outcome of priority projects and prioritization decisions
- Healthcare margins negatively impacted by product mix
- 2017 special gains of ~€200 m will not recur
- Performance Materials sales and earnings continuously affected by decline in Liquid Crystals
- First launch preparations for Mavenclad® U.S., driving M&S costs
- FX remains a strong headwind, esp. in H1 2018, and is slightly stronger than anticipated so far; expected EUR/USD 1.19-1.22 for FY 2018

# Group

## Full-year 2018 guidance\*

### Net sales:

Organic +4% to +6% YoY

FX ~ -3% to -5% YoY

~ € 14.4 – 14.8 bn

### EBITDA pre:

Organic -1% to -3% YoY

FX -8 to -10% YoY

~ € 3,700 – 3,900 m

### EPS pre:

~ € 5.00 – 5.30

# Group on a growing and profitable trajectory

## 2019 Group EBITDA pre increase confirmed

**2019**

**Sales**

>

**2018**

**Sales**

**EBITDA pre**

>

**EBITDA pre**

**Margin**

>

**Margin**

### Merck to return to profitable growth track from 2019 onwards



FY 2017 results presentation



**Healthcare and Life Science will compensate for Performance Materials' trough year**



# Group

## 2018 business sector guidance\*



### Net sales

- Sound organic growth of +4% to +5%: ongoing organic Rebif® decline offset by growth in other franchises
- Full-year contributions from 2017 launches

### EBITDA pre

- Organic -1% to -2% YoY
- FX -9% to -11% YoY
- ~ €1,540 – 1,600 m (excl. CH)



### Net sales

- Organic growth ~+7% to 8%: slightly above market; all businesses contributing; main driver Process Solutions
- Full realization of expected topline synergies

### EBITDA pre

- Organic ~+8% YoY
- FX -3% to -5% YoY
- ~ €1,830 - 1,880 m



### Net sales

- About stable with -1% to +1% YoY
- Volume increases in major businesses
- Liquid Crystals temporarily benefiting from China capacity ramp-up

### EBITDA pre

- Organic -14% to -16% YoY
- FX -6% to -8% YoY
- ~ €745 – 785 m

# Additional financial guidance 2018

## Further financial details

Corporate & Other EBITDA pre	~ -€360 – -400 m
Interest result	~ -€230 – -250 m
Effective tax rate	~ 24% to 26%
Capex on PPE	~ €900 – 950 m
Hedging/USD assumption	<b>Q4/2018 – FY 2019 hedge ratio ~60% at EUR/USD ~1.20</b>
2018 Ø EUR/USD assumption	~ 1.18 – 1.21

Group

## Merck KGaA, Darmstadt, Germany has clear financial priorities



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



**Ongoing cost discipline**



**Efficient capital  
allocation**

- **Strong cash flow** will be used to drive down gearing to <2x net debt / EBITDA pre in 2018
- **Larger acquisitions (>€500 m) ruled out** for 2018 (or financed by divestments)
- **Dividend policy** that ensures a sustainable and resilient development
- **Synergy generation** is utmost priority
- **Cost discipline** continues in all business sectors
- **Further efficiency gains** from ongoing improvement and harmonization of processes and systems
- **All our businesses** have growth potential
- **Decisions on growth investments** are based on sound business cases and robust clinical data

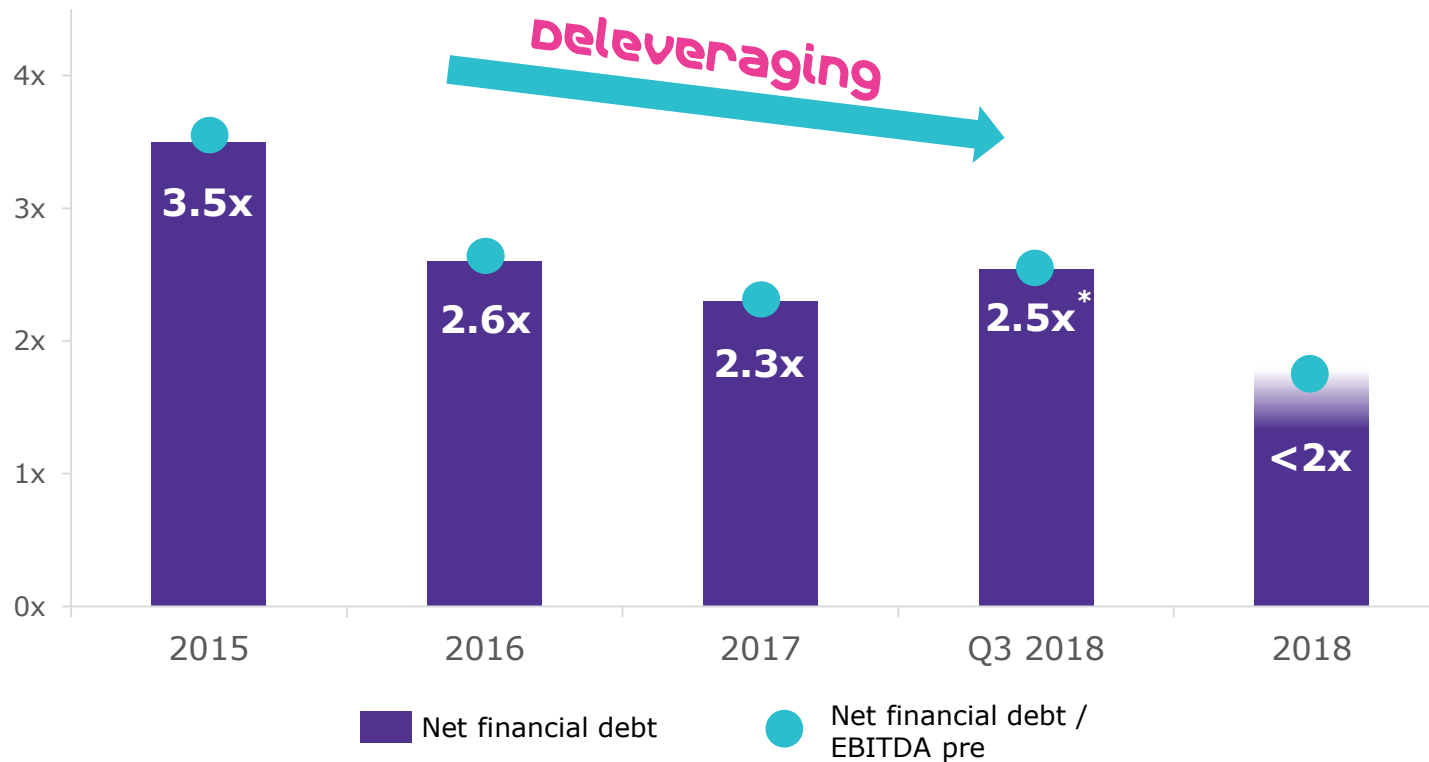
**Near-term financial priorities will secure our profitable growth path**

## Group

# Strong focus on cash generation to ensure swift deleveraging

## Net financial debt<sup>1</sup> 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
- Cash flow will be used to drive down leverage to expected <2x net debt/EBITDA pre in 2018
- Larger acquisitions (>€500 m) remain ruled out 2018

<sup>1</sup>Net financial debt (without pensions);

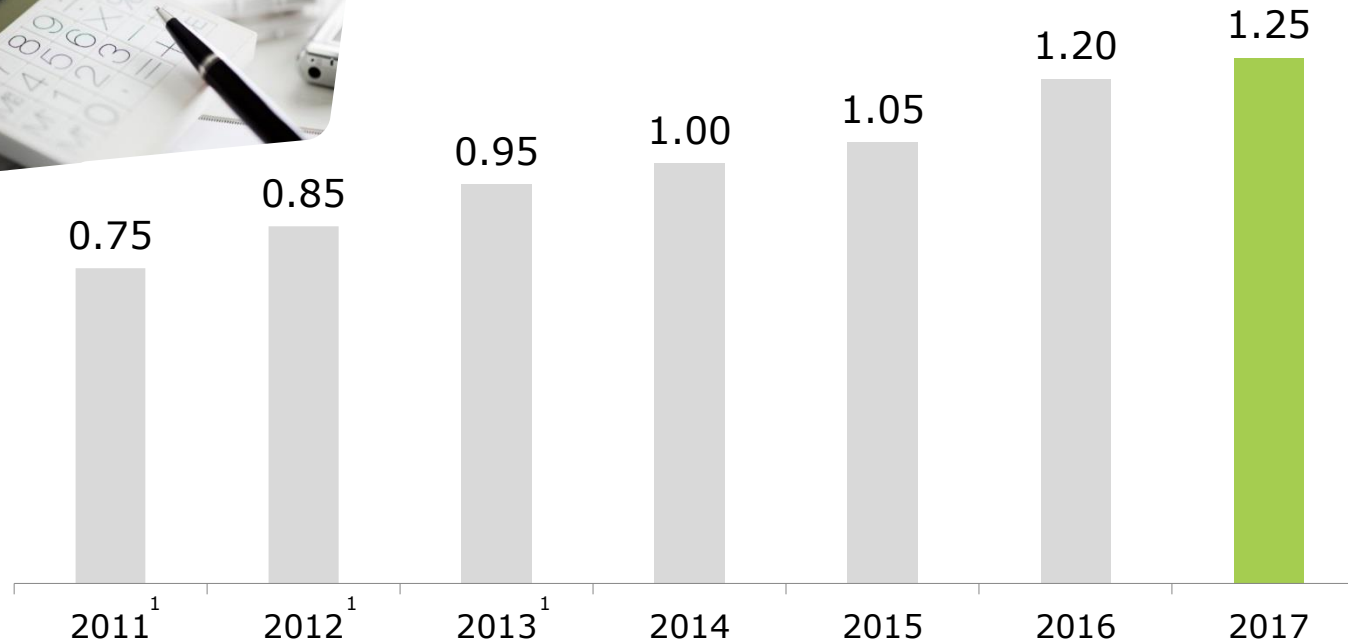
\*EBITDA pre (except FY) reflects last twelve months value including CH EBITDA pre (Q3 2018: €61 m)



# Group

## Dividend growth sustained

### Dividend<sup>1</sup> development 2011-2017



### 2017 dividend

- Dividend of €1.25 (+4% YoY) per share approved for 2017
- 20.3% of EPS pre
- Sustainable dividend growth
- Dividend yield<sup>2</sup> of 1.4%

<sup>1</sup>Adjusted for share split, which has been effective since June 30, 2014; <sup>2</sup>Calculated with 2017 year-end share price of 89.75€ per share

The background features a solid light green field. On the left side, there are several overlapping, rounded, organic shapes in shades of purple and pink. The word "back-up" is written in a bold, purple, sans-serif font, positioned in the upper right area of the image.

**back-up**

# SEMICONDUCTOR PROCESS

Chip Design



Wafer process  
Patterning



**LITHOGRAPHY &  
PROCESS MATERIALS**



Wafer process  
Deposition



**DEPOSITION & SPIN-ON  
DIELECTRIC MATERIALS**



Packaging



**THICK FILM RESISTS &  
CONDUCTIVE PASTE**



Module Assembly

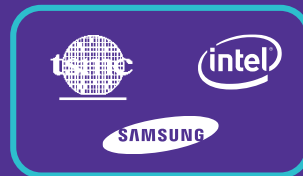
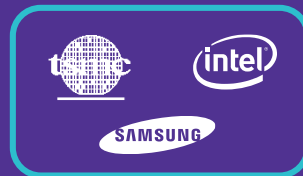


Device



**Merck KGaA, Darmstadt, Germany**

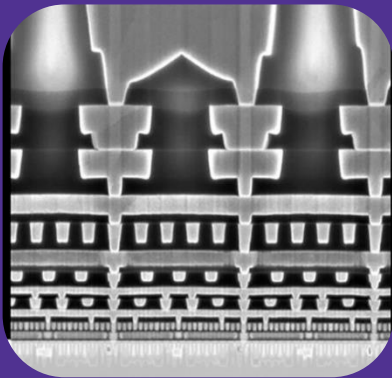
**Materials & Solutions**



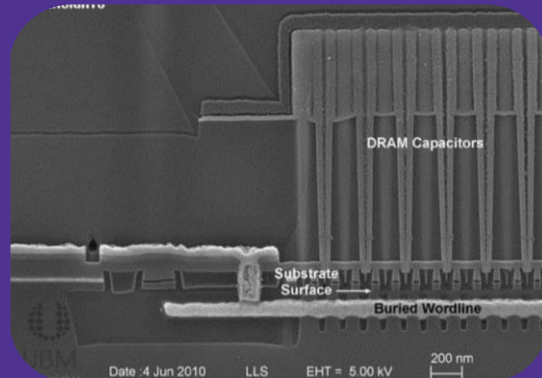
# OUR PRODUCTS ARE USED FOR ...



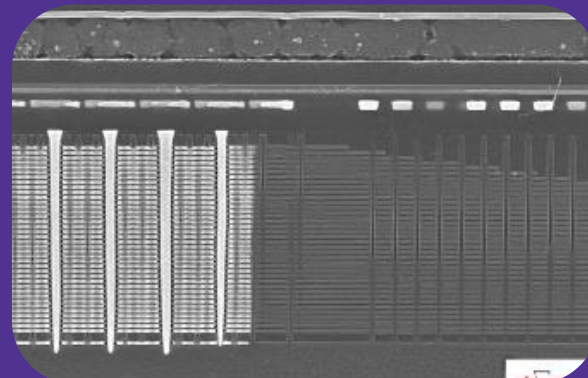
LOGIC



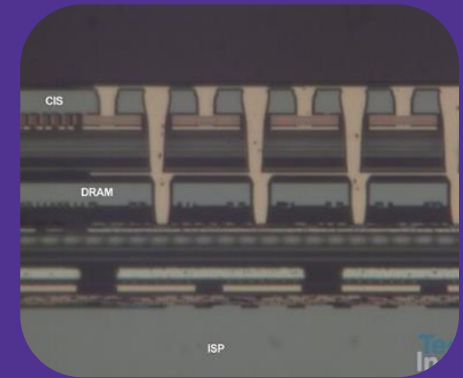
VOLATILE  
MEMORY



NON-VOLATILE  
MEMORY



SENSORS AND  
OTHERS



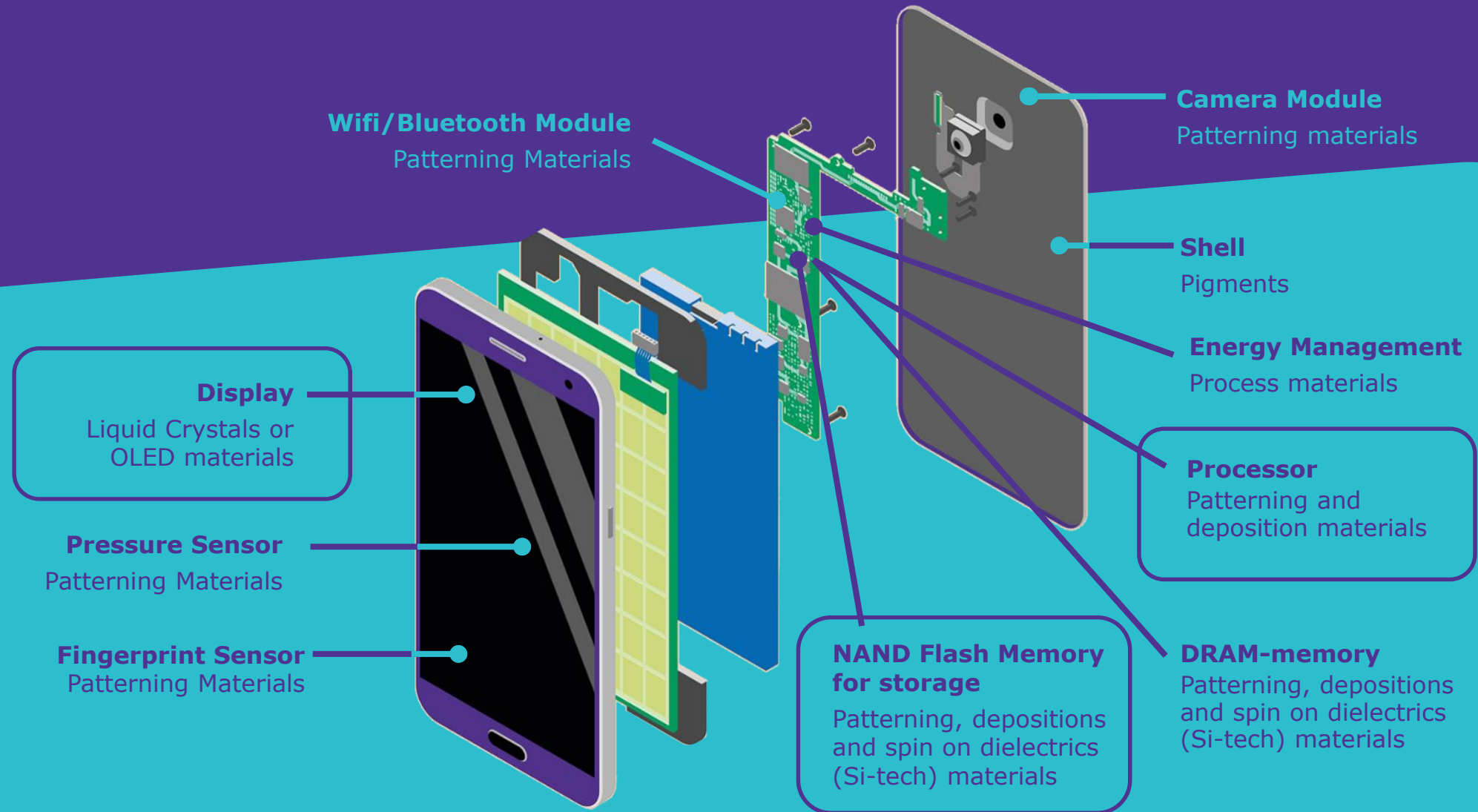
TOSHIBA



SONY

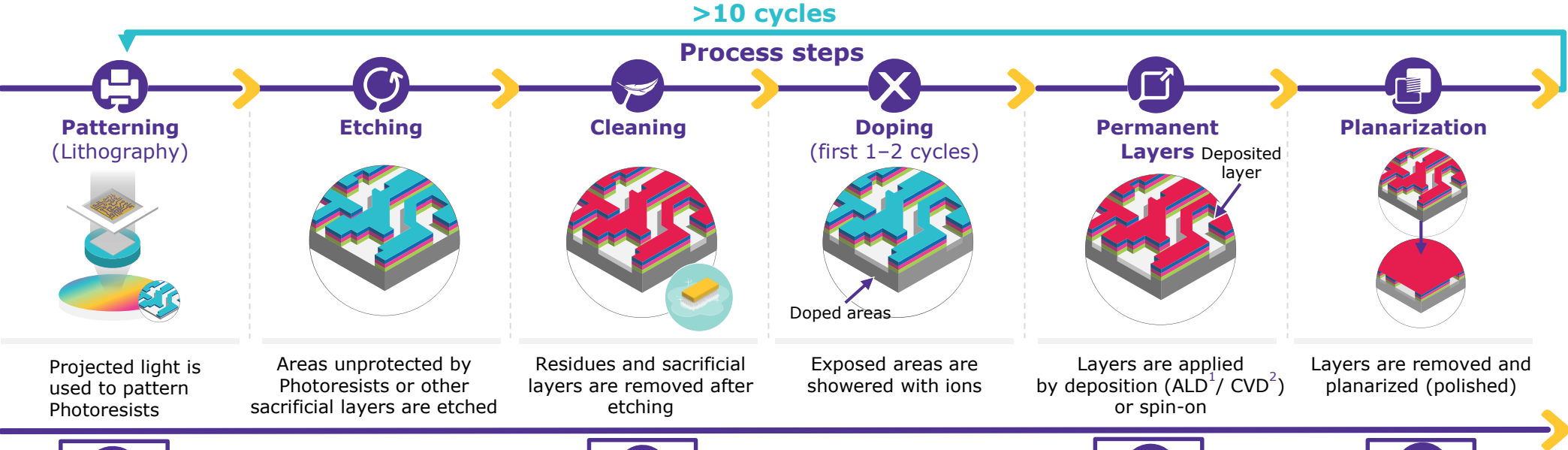


# KEY INNOVATIONS FOR A SMARTPHONE



# Detailed Wafer processing steps

Processing steps



Our offering

<p><b>Patterning</b></p> <ul style="list-style-type: none"> <li>Broad range of products on BARC, TARC, Shrink &amp; Rinse materials</li> <li>Thick film photoresist for multiple generations of lithography technology</li> <li>Innovative patterning technologies/materials under development, incl. DSA, MHM</li> </ul>	<p><b>Cleaning</b></p> <ul style="list-style-type: none"> <li>Wide portfolio of high purity wet chemicals</li> <li>Covering Edge Bead Removers, Strippers, Developers and Photo ancillaries</li> </ul>	<p><b>Permanent Layers</b></p> <ul style="list-style-type: none"> <li>Inorganic &amp; organic SOD materials enhance device performance with excellent gap-filling &amp; superior defectivity performance</li> <li>Rich portfolio of high purity metal &amp; dielectric precursors empower FEOL &amp; BEOL applications for advanced logic &amp; memory devices</li> </ul>
<p><b>Planarization</b></p> <ul style="list-style-type: none"> <li>Klebosol is a leading brand of multipurpose colloidal silica, with applications in diverse industries ranging from beverages to electronics</li> </ul>		

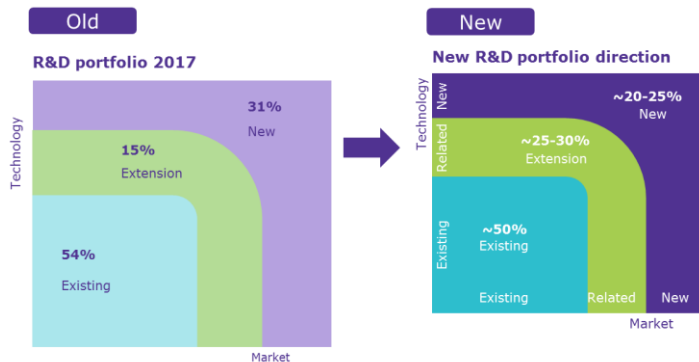
Our semiconductor products enable entire wafer chip production

<sup>1</sup>Atomic layer deposition; <sup>2</sup>Chemical Vapor Deposition

# Performance Materials

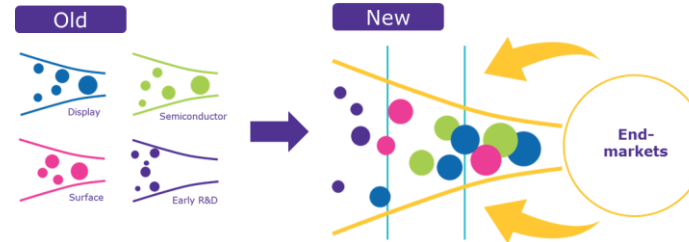
## R&D activities will follow three principles to ensure higher R&D efficiency

### Optimized R&D risk portfolio



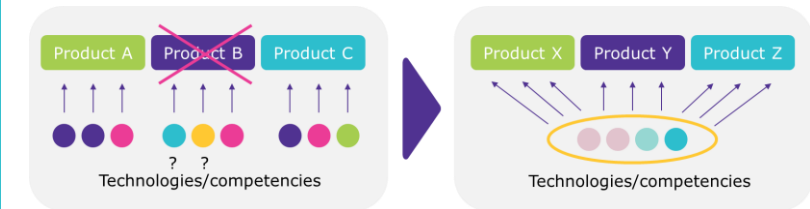
- Stronger focus on existing end-market needs
- Shifting resources towards extension projects
- Reducing reliance on individual large projects in category "New technologies in new markets"

### Centralized portfolio management



- Faster stop/go decision making
- Risk-adjusted pipeline assessment
- Improved transparency

### Integrated R&D organization



- Central resource allocation
- Responding faster to changing customer requirements
- Leverage competence across projects and businesses



# Healthcare Strategy

## The Healthcare Pipeline continues to deliver

November 5, 2018

### Phase I

**M2698**  
**p70S6K & Akt inhibitor**  
Solid tumors

**M3814**  
**DNA-PK inhibitor**  
Solid tumors

**M6620 (VX-970)**  
**ATR inhibitor**  
Solid tumors

**M4344 (VX-803)**  
**ATR inhibitor**  
Solid tumors

**M3541**  
**ATM inhibitor**  
Solid tumors

**M8891**  
**MetAP2 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/TGFbeta trap**  
Solid tumors

**M6495**  
**anti-ADAMTS-5 nanobody**  
Osteoarthritis

**M5049**  
**Immune receptor inhibitor**  
Immunology

**M5717**  
**PeEF2 inhibitor**  
Malaria

### Phase II

**tepotinib**  
**MET kinase inhibitor**  
Non-small cell lung cancer

**tepotinib**  
**MET kinase inhibitor**  
Hepatocellular cancer

**avelumab**  
**anti-PD-L1 mAb**  
Merkel cell cancer 1L<sup>1</sup>

**avelumab**  
**anti-PD-L1 mAb**  
Solid tumors<sup>2</sup>

**avelumab**  
**anti-PD-L1 mAb**  
Non-small cell lung cancer<sup>2</sup>

**avelumab**  
**anti-PD-L1 mAb**  
Urothelial cancer<sup>2</sup>

**abrituzumab<sup>3</sup>**  
**pan-av integrin inhibiting mAb**  
Colorectal cancer 1L<sup>1</sup>

**M7824**  
**anti-PD-L1/TGFbeta trap**  
Non-small cell lung cancer 1L<sup>1</sup>

**sprifermin**  
**fibroblast growth factor 18**  
Osteoarthritis

**atacept**  
**anti-BlyS/APRIL fusion protein**  
Systemic lupus erythematosus

**atacept**  
**anti-BlyS/APRIL fusion protein**  
IgA nephropathy

**evobrutinib**  
**BTK inhibitor**  
Rheumatoid arthritis

**evobrutinib**  
**BTK inhibitor**  
Systemic lupus erythematosus

**M1095 (ALX-0761)<sup>4</sup>**  
**anti-IL-17 A/F nanobody**  
Psoriasis

**evobrutinib**  
**BTK inhibitor**  
Multiple sclerosis

### Phase III

**avelumab - anti-PD-L1 mAb**  
Non-small cell lung cancer 1L<sup>1</sup>

**avelumab - anti-PD-L1 mAb**  
Gastric cancer 1L-M<sup>1M</sup>

**avelumab - anti-PD-L1 mAb**  
Ovarian cancer platinum resistant/refractory

**avelumab - anti-PD-L1 mAb**  
Ovarian cancer 1L<sup>1</sup> and 1L-M<sup>1M</sup>

**avelumab - anti-PD-L1 mAb**  
Ovarian cancer 1L<sup>1,5</sup>

**avelumab - anti-PD-L1 mAb**  
Urothelial cancer 1L-M<sup>1M</sup>

**avelumab - anti-PD-L1 mAb**  
Renal cell cancer 1L<sup>1</sup>

**avelumab - anti-PD-L1 mAb**  
Locally advanced head and neck cancer

### Registration

**cladribine tablets**  
**lymphocyte-targeting agent**  
Relapsing multiple sclerosis<sup>6</sup>

- Oncology
- Immuno-Oncology
- Immunology
- Neurology
- Global Health

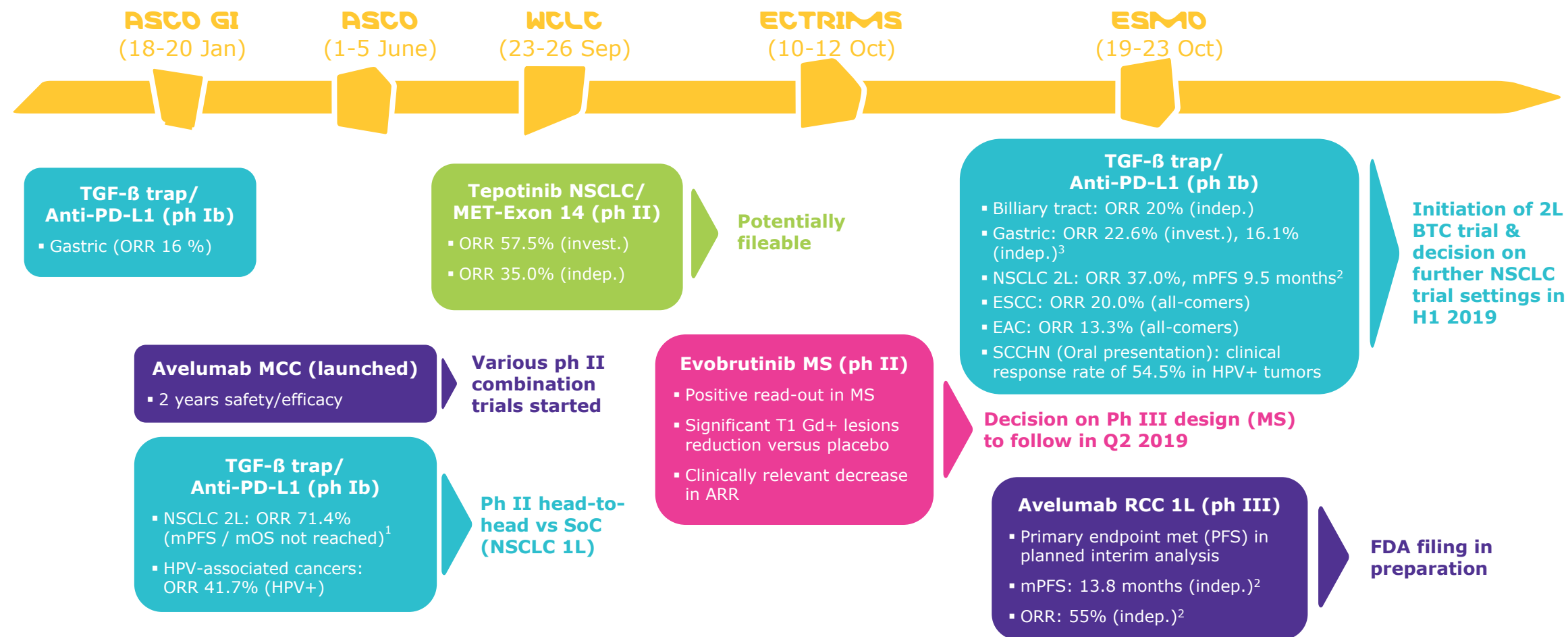
<sup>1</sup> First-line treatment; <sup>1M</sup> First-line maintenance treatment. <sup>2</sup> Avelumab combination studies with talazoparib, axitinib, ALK inhibitors, chemotherapy, or novel immunotherapies. <sup>3</sup> As announced on May 2 2018, in an agreement with SFJ Pharmaceuticals Group, abrituzumab will be developed by SFJ for colorectal cancer through Phase II/III clinical trials. <sup>4</sup> As announced on March 30 2017, in an agreement with Avillion, anti-IL-17 A/F nanobody will be developed by Avillion for plaque psoriasis and commercialized by Merck KGaA, Darmstadt, Germany. <sup>5</sup> Avelumab in combination with talazoparib. <sup>6</sup> As announced on July 30 2018, the US Food and Drug Administration (FDA) has accepted the resubmission of the New Drug Application (NDA) for cladribine tablets.

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.



# Healthcare Strategy

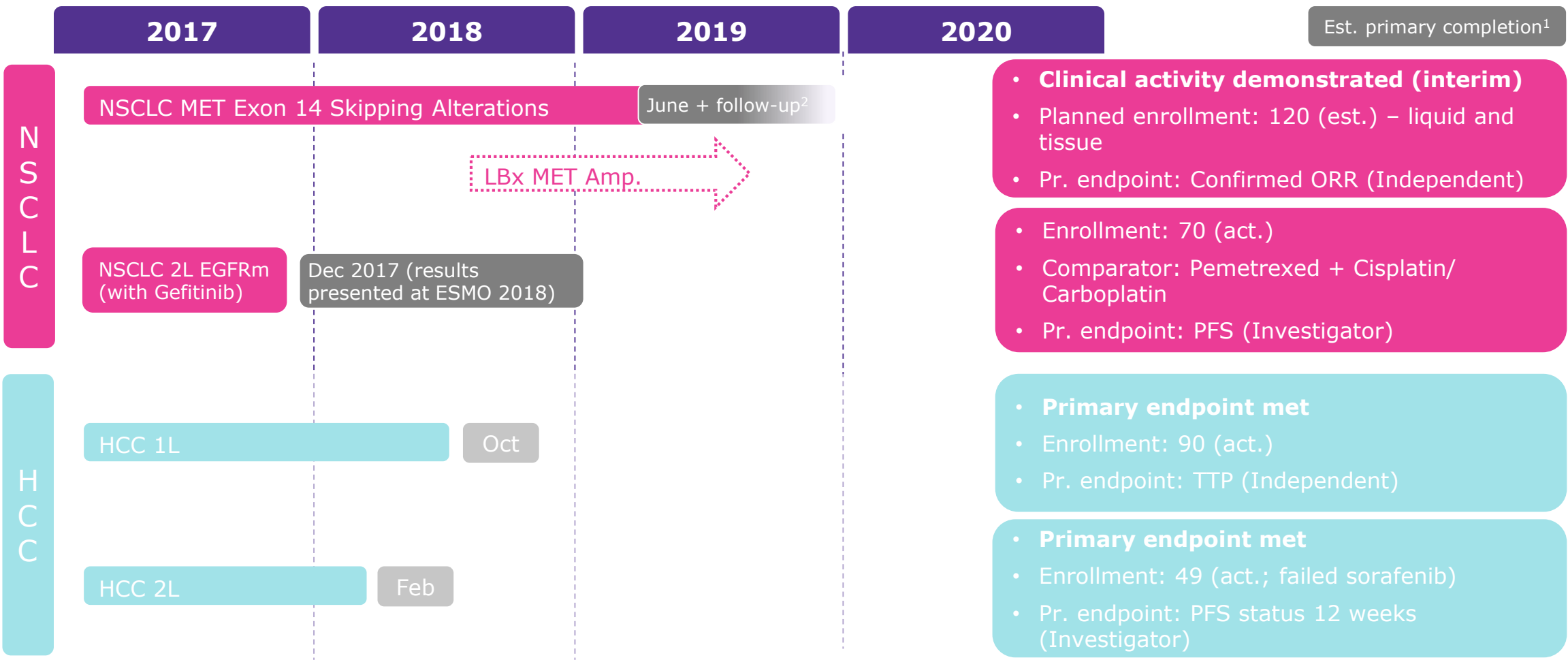
## Continuous newsflow of data throughout 2018 triggered next phases for our key assets



<sup>1</sup>PD-L1 high; <sup>2</sup>PD-L1 ≥ 1%; <sup>3</sup>Update from ASCO GI; Abbreviations: 2L = second line therapy; PR = partial response; ORR = objective response rate; NSCLC = Non-small-cell lung carcinoma; (m)PFS = (median) progression-free survival; (m)OS = (median) Overall survival; HPV = human papillomavirus; SoC = standard of care; MCC = Merkel cell carcinoma; RCC = Renal cell carcinoma; RR = lesion rate ratio; ARR = annualised relapse rate; SCCHN = squamous cell carcinoma of the head and neck; ESCC = Esophageal squamous cell carcinoma; EAC = Esophageal adenocarcinoma; CRC = Colorectal Cancer

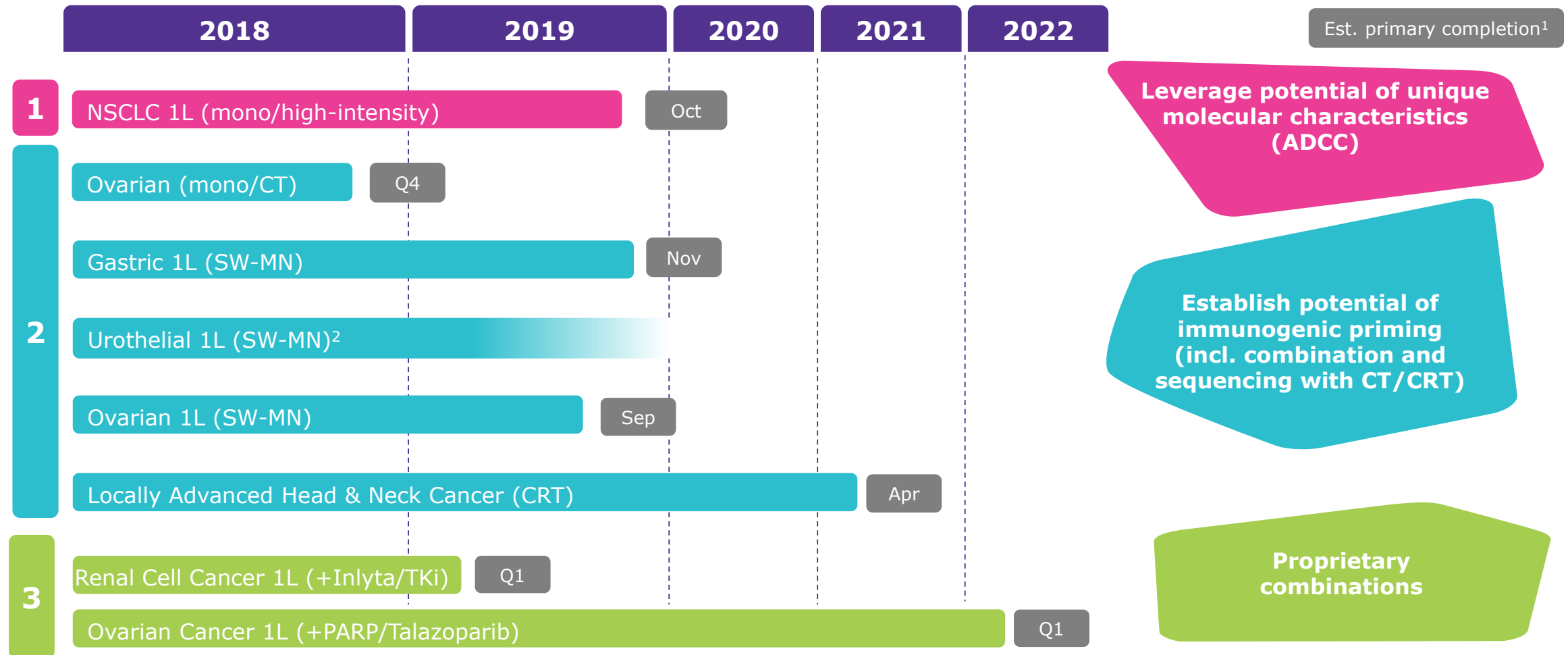
Tepotinib: Program overview

Development focus on biomarker enriched patient populations



# Avelumab: Program overview

## Ongoing studies – Seven Phase III trials, more than 15 tumor types

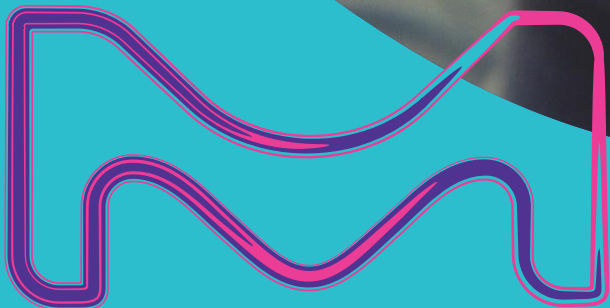


<sup>1</sup> Estimated primary completion date according to Clinicaltrials.gov as of October 26, 2018; timelines are event-driven and may be subject to change; <sup>2</sup> Estimated primary completion date being reprojected; Acronyms: NSCLC: Non Small Cell Lung Cancer, CT: Chemotherapy, CRT: Chemoradiotherapy, Plat. Res./Ref.: Platinum Resistant/Refractory, MN: Maintenance; SW: Switch

# A GOOD QUARTER

Merck KGaA, Darmstadt, Germany Q3 2018 results

November 14, 2018



# Agenda

**01** Executive summary

**02** Financial overview

**03** Guidance



# 01 EXECUTIVE SUMMARY

# Highlights

## Operations

- ▶ Healthcare – Strong organic performance, Mavenclad<sup>®</sup> and Bavencio<sup>®</sup> launches on track
- ▶ Life Science – Strong organic sales performance across all businesses amid low base LY
- ▶ Performance Materials – Strong growth of Semiconductor Solutions and OLED; LC benefited from new plant ramp up projects in China

## Financials

- ▶ Org. sales growth of +8.8%; Org. EBITDA pre growth of +3.7%
- ▶ 9M org. sales growth of +5.7%; 9M org. EBITDA pre decline of -3.1%
- ▶ Organic guidance confirmed<sup>1</sup>: org. net sales growth +4 to +6%; org. EBITDA pre decline -1 to -3%

<sup>1</sup>Guidance excludes Consumer Health

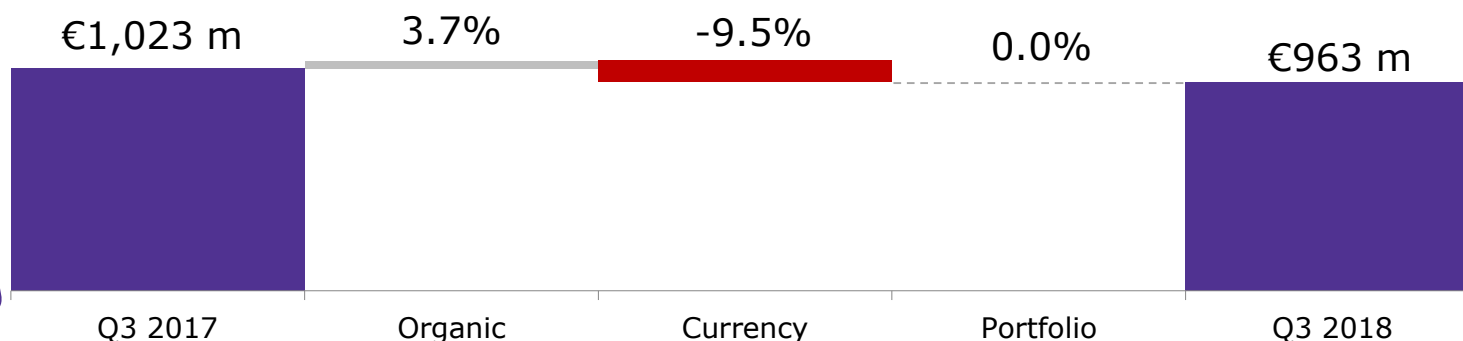
## Organic growth across all business segments

### Q3 2018 YoY net sales

	Organic	Currency	Portfolio	Total
Healthcare	9.9%	-3.3%	0.0%	<b>6.6%</b>
Life Science	9.8%	-1.4%	0.0%	<b>8.5%</b>
Performance Materials	3.4%	-0.9%	0.0%	<b>2.4%</b>
Group	8.8%	-2.1%	0.0%	<b>6.6%</b>

- Healthcare reflects strong growth driven by solid core business and launches of Mavenclad<sup>®</sup> and Bavencio<sup>®</sup>
- Above-market growth in Life Science driven by all business segments
- Performance Materials reflects ongoing strong demand of Semiconductor & OLED; new plant ramp up projects in China supported LC

### Q3 YoY EBITDA pre



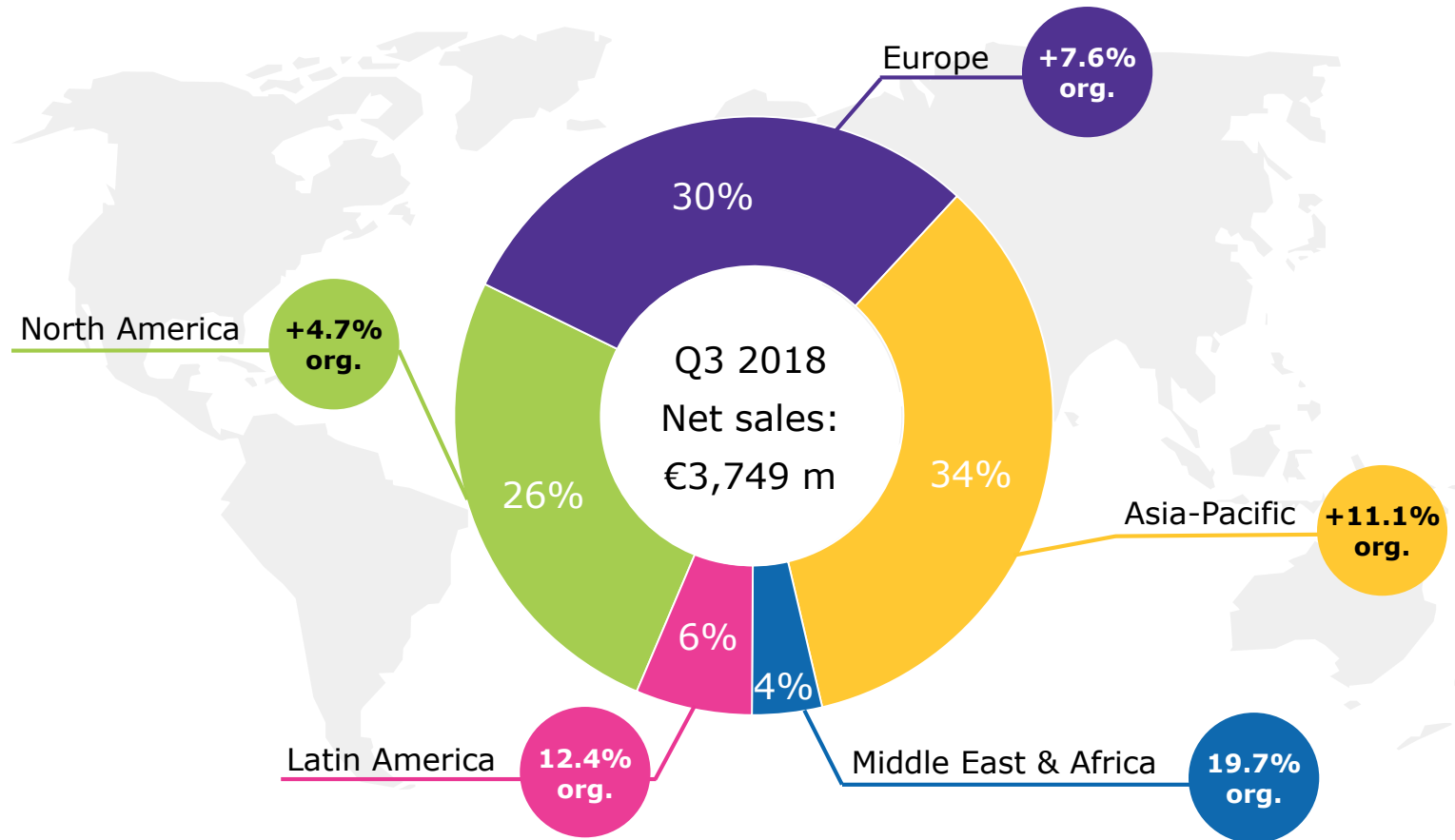
Totals may not add up due to rounding;  
BRL = Brazilian real; ARS = Argentine peso

- Organic growth reflects strong topline mitigated by LY one-time effect in Healthcare, LS strategic investments and PM business mix
- FX impact exacerbated by transactional effects from depreciating BRL\* & ARS\*



# Organic growth in all regions

## Regional breakdown of net sales [€ m]



## Regional organic development

- Strong growth in Europe reflects strong demand in Life Science, Mavenclad<sup>®</sup> ramp up, and continued resilience of Fertility
- Solid growth in North America due to Life Science; Fertility and Bavencio<sup>®</sup> more than offset ongoing decline of Rebif<sup>®</sup>
- Solid growth in APAC across all major businesses, driven by double-digit growth in Life Science, Healthcare and PM
- Very strong performance in LATAM driven by Healthcare and Life Science
- MEA reflects strong demand of Healthcare's core business, mainly Glucophage<sup>®</sup> and tender phasing of Erbitux<sup>®</sup>



## 02 FINANCIAL OVERVIEW

## Q3 2018: Overview

### Key figures

[€m]	Q3 2017	Q3 2018	Δ
Net sales	3,517	<b>3,749</b>	6.6%
EBITDA pre	1,023	<b>963</b>	-5.9%
Margin (in % of net sales)	29.1%	25.7%	
EPS pre	1.43	<b>1.32</b>	-7.7%
Operating cash flow	758	<b>731</b>	-3.5%

[€m]	Dec. 31, 2017	Sept. 30, 2018	Δ
Net financial debt	10,144	<b>10,168</b>	0.2%
Working capital	3,387	<b>3,784</b>	11.7%
Employees*	52,941	<b>54,756</b>	3.4%

\*Thereof CH Headcount ~3.400;  
Totals may not add up due to rounding

### Comments

- EBITDA pre & margin reduction driven by FX effects & hedging losses, investments in LS, PM business mix and LY milestone payments in HC
- Lower EPS pre in line with EBITDA pre decline
- Net financial debt reduced by €506 m vs. June 30<sup>th</sup> 2018
- Working capital reflects strong organic sales growth
- Higher headcount related to growth initiatives in Life Science and launch activities in Healthcare

# Reported figures

## Reported results

[€m]	Q3 2017	Q3 2018	Δ
EBIT	862	<b>491</b>	-43.1%
Financial result	-65	<b>-56</b>	-14.5%
Profit before tax	797	<b>435</b>	-45.4%
Income tax	-177	<b>-112</b>	-36.9%
<i>Effective tax rate (%)</i>	22.2%	<b>25.7%</b>	
Net income <sup>*</sup>	644	<b>340</b>	-47.2%
EPS (€) <sup>*</sup>	1.48	<b>0.78</b>	-47.3%

## Comments

- Lower EBIT reflects LY effects of Biosimilars disposal gain (~ €321 m) and Bavencio<sup>®</sup> milestone payments (~ €50 m)
- Profit before tax in line with EBIT decrease
- Effective tax rate within guidance range of ~24-26%

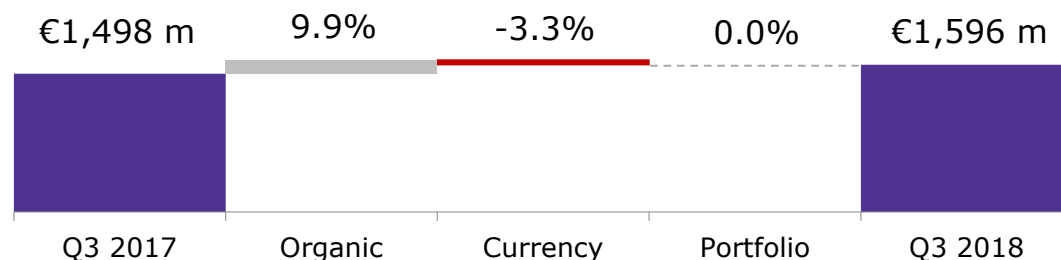
<sup>\*</sup>From continuing and discontinued operations;  
Totals may not add up due to rounding

# Healthcare: Strong organic growth overcompensates FX headwinds; Profitability burdened by LY's favorable one-time effects

## Healthcare P&L

[€m]	Q3 2017	Q3 2018
Net sales	1,498	<b>1,596</b>
Marketing and selling	-583	<b>-571</b>
Administration	-64	<b>-72</b>
Research and development	-416	<b>-409</b>
EBIT	539	<b>191</b>
EBITDA	707	<b>372</b>
EBITDA pre	397	<b>381</b>
Margin (in % of net sales)	26.5%	<b>23.9%</b>

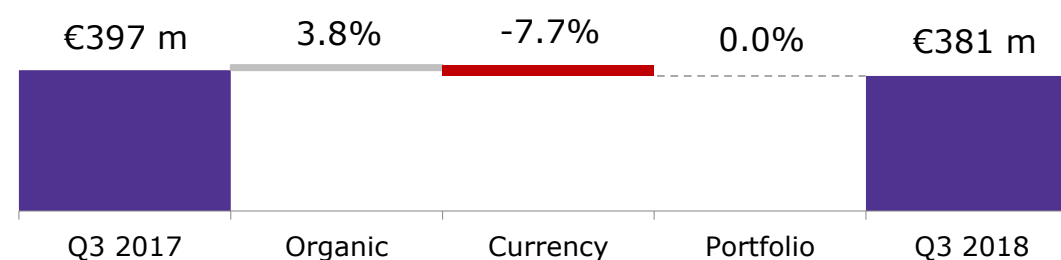
## Net sales bridge



## Comments

- Strong organic growth fueled by double-digit growth of Fertility and Glucophage<sup>®</sup>; Mavenclad<sup>®</sup> and Bavencio<sup>®</sup> launches on track
- Erbitux<sup>®</sup> benefitting from phasing, still facing ongoing competition and price pressure in major markets
- Ongoing decline of Rebif<sup>®</sup> due to competition in U.S. & EU
- FX offsetting M&S investments for Mavenclad<sup>®</sup>
- EBITDA pre reflects FX headwinds (mainly BRL\* & ARS\*) strong topline contribution offsets unfavorable prior year effect (two Bavencio<sup>®</sup> milestones of ~€50 m)

## EBITDA pre bridge



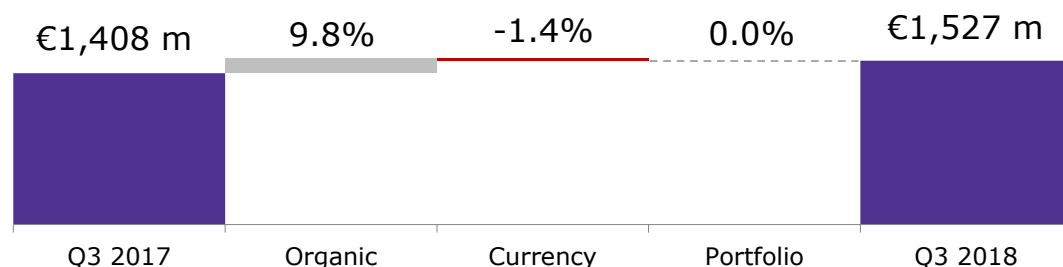
Totals may not add up due to rounding;  
\* BRL = Brazilian real; ARS = Argentine peso

# Life Science: Strong organic sales growth across all businesses drives EBITDA pre

## Life Science P&L

[€m]	Q3 2017	Q3 2018
Net sales	1,408	<b>1,527</b>
Marketing and selling	-412	<b>-443</b>
Administration	-59	<b>-69</b>
Research and development	-60	<b>-59</b>
EBIT	220	<b>277</b>
EBITDA	401	<b>449</b>
EBITDA pre	426	<b>460</b>
Margin (in % of net sales)	30.2%	<b>30.1%</b>

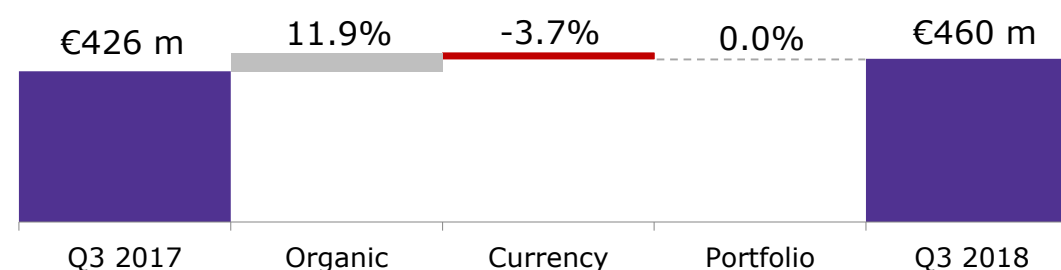
## Net sales bridge



## Comments

- Process Solutions posts double digit growth driven by all businesses, especially strong demand for filtration and single-use
- Applied Solutions shows high-single digit growth, reflecting continued strong demand for lab water
- Research Solutions benefits from positive demand trends across all businesses and regions, especially reagents and laboratory chemicals
- Strategic investments in viral vector manufacturing, single-use bioprocessing and China expansion start to impact topline growth
- M&S increase in line with previous quarters and topline growth
- EBITDA pre reflects strong topline growth, offset by investments in eCommerce and strategic initiatives as well as FX headwinds

## EBITDA pre bridge

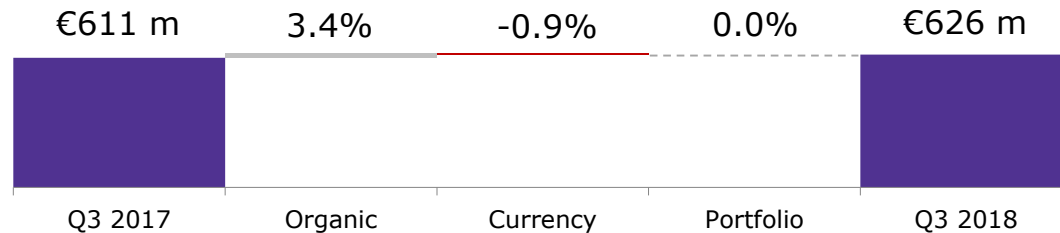


# Performance Materials: Organic growth mainly driven by Semiconductor Solutions

## Performance Materials P&L

[€m]	Q3 2017	Q3 2018
Net sales	611	<b>626</b>
Marketing and selling	-56	<b>-62</b>
Administration	-18	<b>-22</b>
Research and development	-57	<b>-65</b>
EBIT	191	<b>142</b>
EBITDA	246	<b>202</b>
EBITDA pre	249	<b>203</b>
Margin (in % of net sales)	40.7%	<b>32.5%</b>

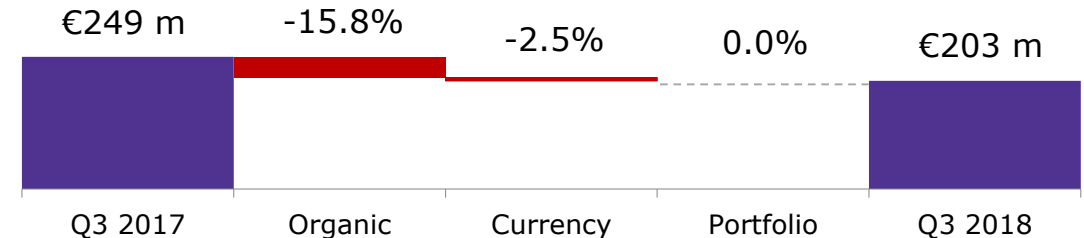
## Net sales bridge



## Comments

- Moderate organic growth in PM driven by growth of Semiconductor Solutions & OLED; LC benefited from new panel plant ramp up projects in China
- Above-market growth of Semiconductor Solutions reflects strong demand of dielectrics, silica and lithography materials
- Ongoing strong demand for innovative UB-FFS technology
- M&S in line with topline growth and with previous quarters
- Increased R&D due to Semiconductor Solutions related projects
- Profitability reflects negative business mix and ongoing LC price decline

## EBITDA pre bridge



# Performance Materials: Strong quarter benefitting from continued demand in Semiconductor Solutions

Net sales by BU,  
in %

Q3 2018  
Net Sales  
€ 626 m

## Semiconductor Solutions

- High single-digit growth above market driven by volume and market share wins
- Increasing demand for patterning and dielectric materials at 3D NAND and DRAM customers
- Spin-on dielectrics driving double digit growth with market share gains
- Strong consumption of deposition and CMP\* materials at customers

## Surface Solutions

- Flat automotive market in China
- Lateral development of overall surface solutions business

## Display Solutions

- Continued increasing demand in UB-FFS for small devices
- Partner of choice for bringing new capacity online (limited time frame)
- Underlying trend of declining LC materials market still valid
- LC related materials < 50% of total PM net sales
- OLED participating in capacity expansion with double digit growth

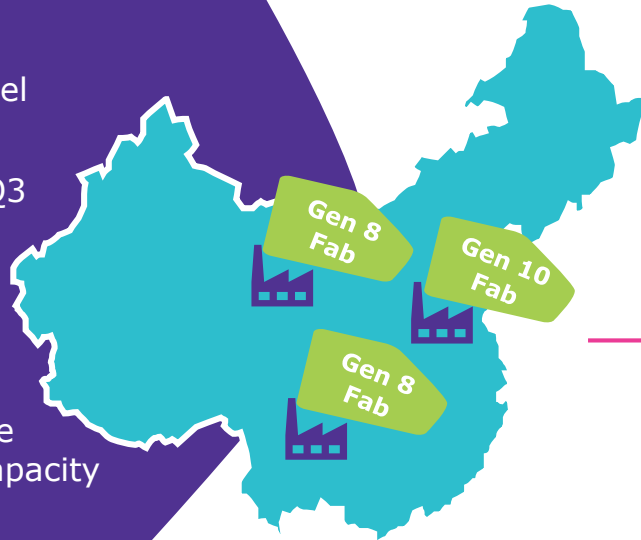
\*CMP = chemical mechanical planarization



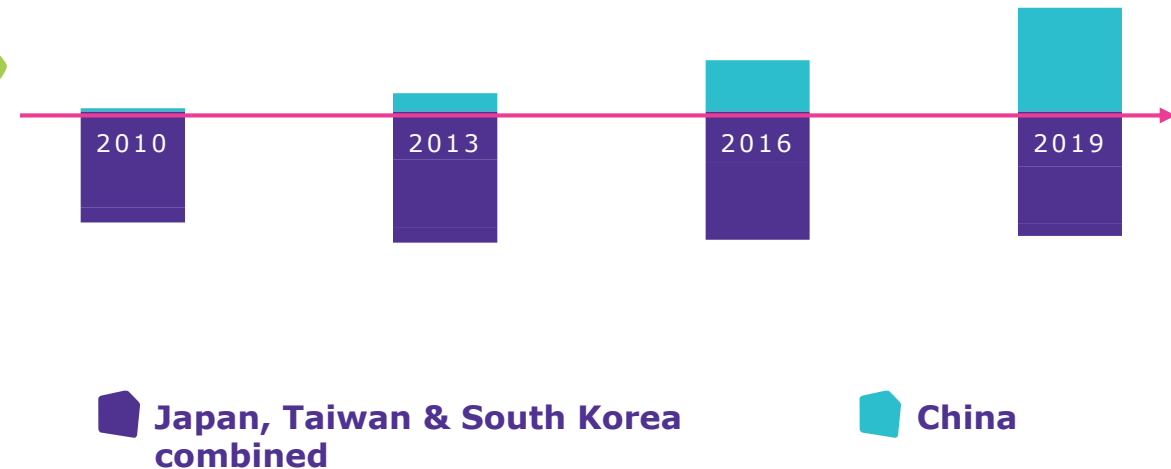
# Performance Materials: Liquid crystals currently benefitting from new display-panel plant capacity ramp up projects

## Temporary nature

- Accelerated ramp up of Chinese panel production facilities
- Projects supporting LC business in Q3 and expected to last until H1 2019
- Increased market share during ramp up phase, but dual sourcing afterwards highly probable
- Overcapacity in 2018 due to massive capacity ramp up in China, global capacity is expected to consolidate in 2019
  - Some manufacturing capacity might be converted to OLED or might be taken off



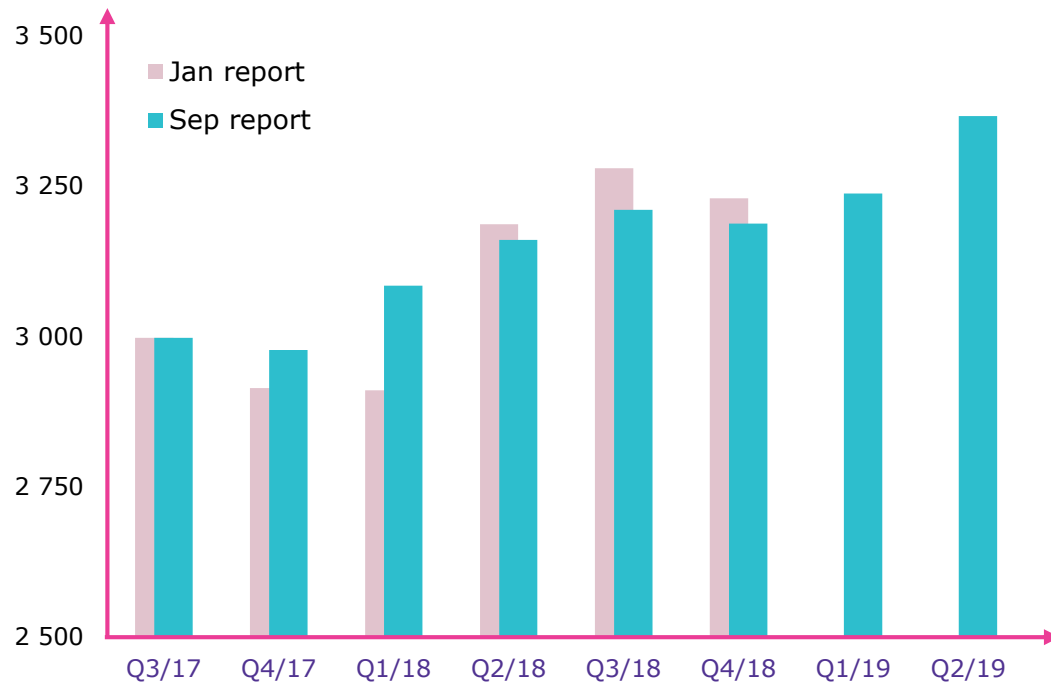
Share of global display production capacities by region [km<sup>2</sup>]\*



**Overall LC materials market decline in value with mid- to high-single digit CAGR until 2025 confirmed**

# Performance Materials: Semiconductor market outlook

Wafer shipments forecast,  
in [MSI\*]

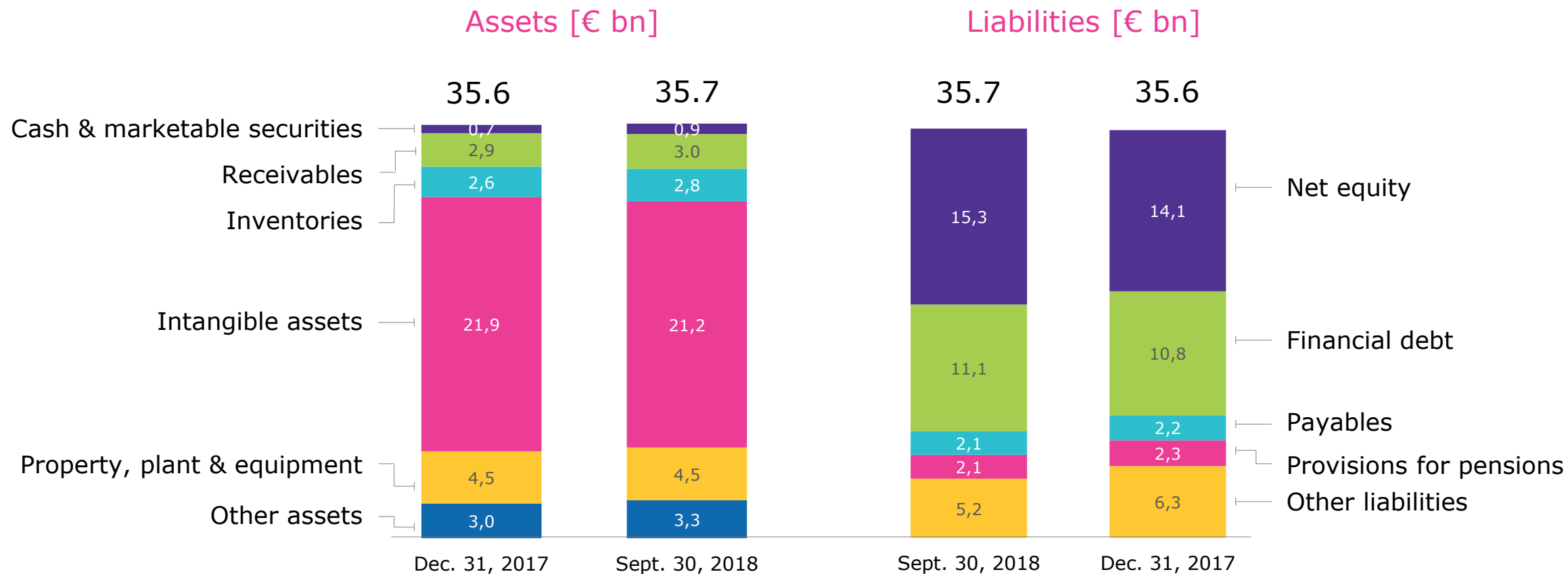


## Market development

- Semiconductor market (revenue) is heavily influenced by the prices in the memory segment
- The material suppliers are relatively independent from this memory price trend
- Wafers shipments (in million square inches, MSI) is a better indicator of volume growth for material suppliers
- MSI is independent of the volatile memory prices and reflects end user demand
- MSI is expected to grow at 7% in 2018 and slightly softer at 5.2% in 2019

**Total Semiconductor Market is strongly influenced by memory pricing, while the Materials Market is correlated with the wafer area**

## Balance sheet – deleveraging remains focus



- Total assets about stable, with an increased equity ratio of 42.9%
- Decrease in intangible assets reflects D&A (~-€0.9 bn) mitigated by FX (~+€0.4 bn)

- Higher net equity reflects 9M net income (~+€0.9 bn) and FX (~+€0.3 bn)
- Other liabilities decrease mainly driven by profit transfer to E. Merck KG, Darmstadt, Germany

Totals may not add up due to rounding

# Cash flow statement

## Q3 2018 – cash flow statement

[€m]	Q3 2017	Q3 2018	Δ
Profit after tax	648	<b>345</b>	-303
D&A	419	<b>428</b>	9
Changes in provisions	-50	<b>69</b>	119
Changes in other assets/liabilities	99	<b>6</b>	-93
Other operating activities	-327	<b>-9</b>	318
Changes in net working capital	-31	<b>-107</b>	-76
Operating cash flow	758	<b>731</b>	-27
Investing cash flow	-90	<b>-218</b>	-128
thereof Capex on PPE	-197	<b>-215</b>	-18
Financing cash flow	-844	<b>-287</b>	557

## Cash flow drivers

- LY profit after tax reflects gain from Biosimilars divestment, which is neutralized in other operating activities
- Changes in provisions driven by pension provisions and LTIP
- Changes in other assets/liabilities includes LY upfront payment from Fresenius for future R&D activities
- Changes in working capital reflects higher trade account receivables mainly from HC and buildup of inventories mainly from LS and PM
- Investing cash flow reflects LY Biosimilars cash proceeds ~€150 m
- Financing cash flow reflects decrease in bank loans and commercial papers; LY includes bond repayment ~€700 m



## 03 GUIDANCE

# Group

## Full-year 2018 guidance\*

### Net sales:

Organic +4% to +6% YoY

FX ~ -3% to -5% YoY

~ € 14.4 – 14.8 bn

### EBITDA pre:

Organic -1% to -3% YoY

FX -8 to -10% YoY

~ € 3,700 – 3,900 m

### EPS pre:

~ € 5.00 – 5.30

# Group

## 2018 business sector guidance\*



### Healthcare

#### Net sales

- Sound organic growth of +4% to +5%: ongoing organic Rebif<sup>®</sup> decline offset by growth in other franchises
- Full-year contributions from 2017 launches

#### EBITDA pre

- Organic -1% to -2% YoY
- FX -9% to -11% YoY
- ~ €1,540 – 1,600 m (excl. CH)



### Life Science

#### Net sales

- Organic growth ~+7% to 8%: slightly above market; all businesses contributing; main driver Process Solutions
- Full realization of expected topline synergies

#### EBITDA pre

- Organic ~+8% YoY
- FX -3% to -5% YoY
- ~ €1,830 - 1,880 m



### Performance Materials

#### Net sales

- About stable with -1% to +1% YoY
- Volume increases in major businesses
- Liquid Crystals temporarily benefiting from China capacity ramp-up

#### EBITDA pre

- Organic -14% to -16% YoY
- FX -6% to -8% YoY
- ~ €745 – 785 m







## APPENDIX

## Additional financial guidance 2018

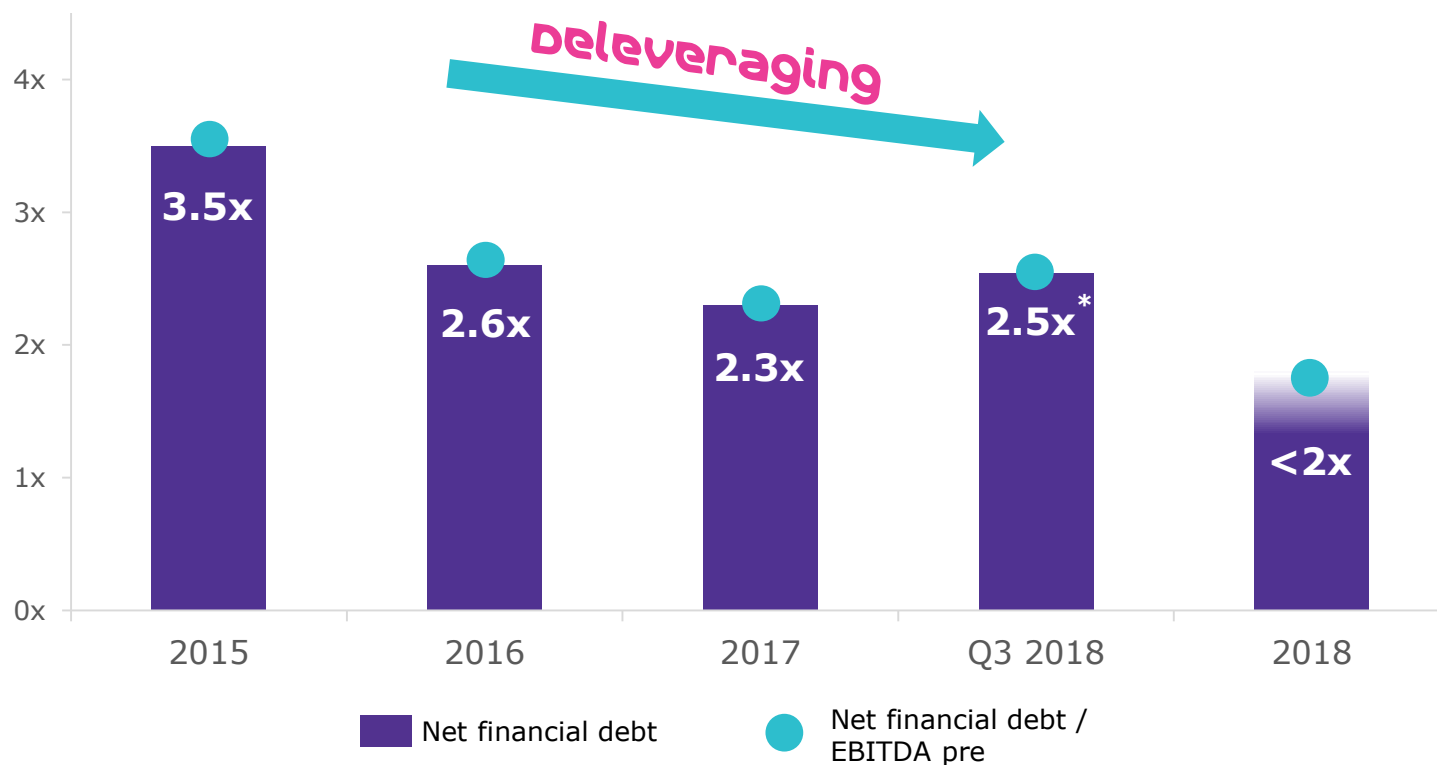
### Further financial details

Corporate & Other EBITDA pre	~ -€360 – -400 m
Interest result	~ -€230 – -250 m
Effective tax rate	~ 24% to 26%
Capex on PPE	~ €900 – 950 m
Hedging/USD assumption	<b>Q4/2018 – FY 2019 hedge ratio ~60% at EUR/USD ~1.20</b>
2018 Ø EUR/USD assumption	~ 1.18 – 1.21

# Strong focus on cash generation to ensure swift deleveraging

## Net financial debt<sup>1</sup> and leverage development

[Net financial debt/  
EBITDA pre]



## Focus on deleveraging

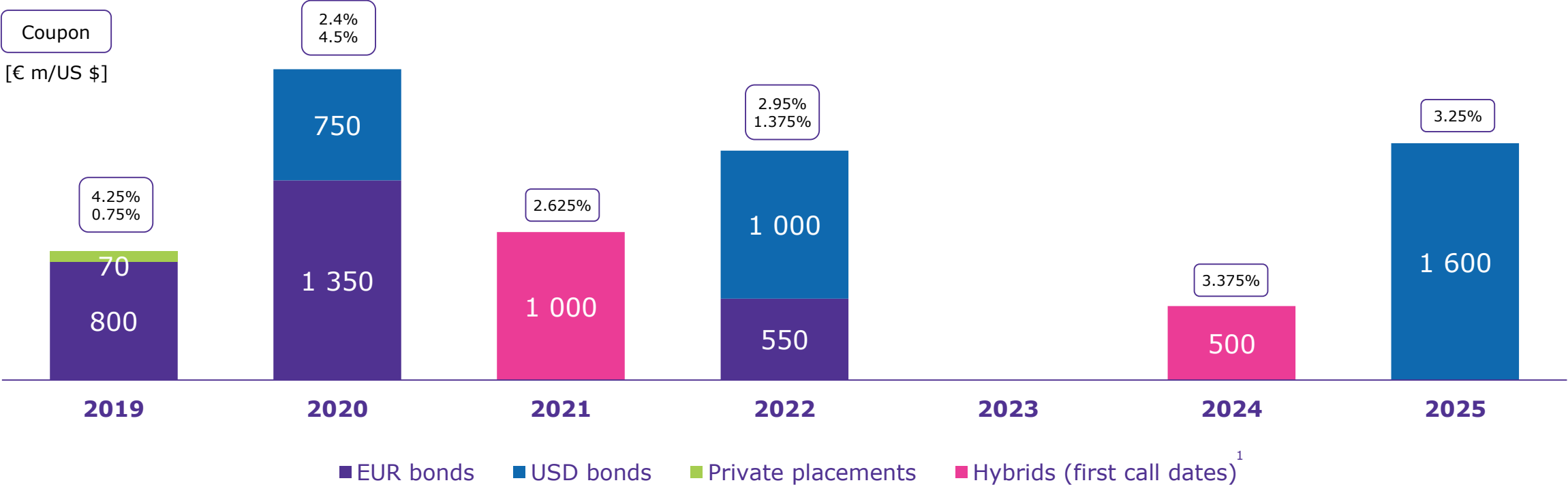
- Commitment to swift deleveraging to ensure a strong investment grade credit rating and financial flexibility
- Cash flow will be used to drive down leverage to expected <2x net debt/EBITDA pre in 2018
- Larger acquisitions (>€500 m) remain ruled out 2018

<sup>1</sup>Net financial debt (without pensions);

\*EBITDA pre (except FY) reflects last twelve months value including CH EBITDA pre (Q3 2018: €61 m)

# Well-balanced maturity profile reflects Sigma-Aldrich financing transactions

Maturity profile as of Sept. 30, 2018



Financing structure enables flexible and swift deleveraging

<sup>1</sup>No decision on call rights taken yet

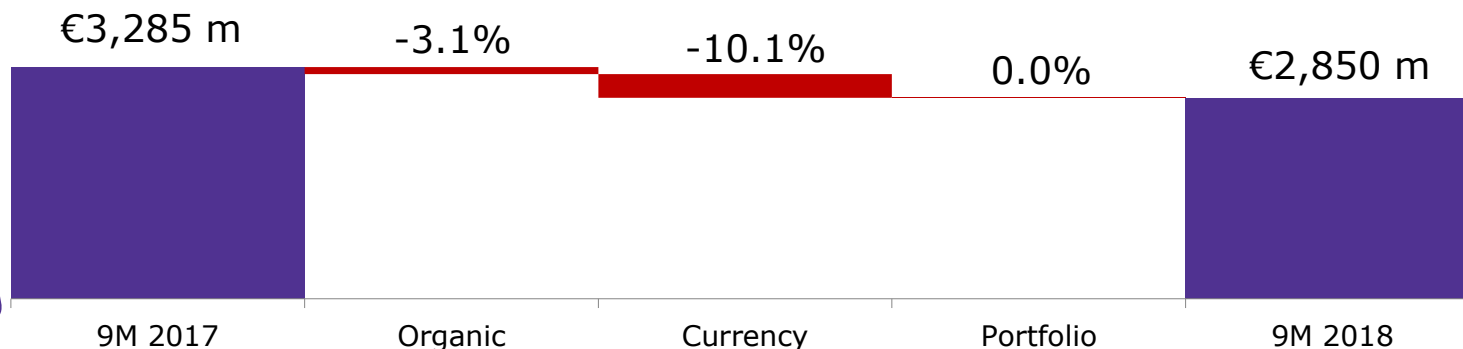
# Organic growth driven by Life Science and Healthcare overcompensating FX headwinds

## 9M 2018 YoY net sales

	Organic	Currency	Portfolio	Total
Healthcare	5.1%	-5.2%	0.0%	<b>0.0%</b>
Life Science	8.8%	-4.8%	0.0%	<b>3.9%</b>
Performance Materials	-0.2%	-4.7%	0.0%	<b>-4.9%</b>
Group	5.7%	-5.0%	0.0%	<b>0.7%</b>

- Healthcare driven by strong demand for Fertility & Glucophage<sup>®</sup>; Rebif<sup>®</sup> decline partially offset by Mavenclad<sup>®</sup>; Bavencio<sup>®</sup> offset Erbitux<sup>®</sup>
- Above-market growth in Life Science driven by all business segments across all major regions
- Performance Materials almost stable; growth of Semiconductor and OLED compensating LC decline
- Moderate FX headwinds (-€539 m) in 9M 2018

## 9M YoY EBITDA pre



- Organic decline of EBITDA pre driven by Healthcare's LY one-time effects, LS strategic investments, PM business mix and ongoing price decline
- Currency effects mainly related to EUR/USD development, hedging burden from Q1 onwards and BRL\* & ARS\* development

\*Totals may not add up due to rounding;  
 \*BRL = Brazilian real; ARS = Argentine peso

## 9M 2018: Overview

### Key figures

[€m]	9M 2017	9M 2018	Δ
Net sales	10,869	<b>10,949</b>	0.7%
EBITDA pre	3,285	<b>2,850</b>	-13.2%
Margin (in % of net sales)	30.2%	26.0%	
EPS pre	4.67	<b>3.89</b>	-16.7%
Operating cash flow	2,055	<b>1,479</b>	-28.0%

[€m]	Dec. 31, 2017	Sept. 30, 2018	Δ
Net financial debt	10,144	<b>10,168</b>	0.2%
Working capital	3,387	<b>3,784</b>	11.7%
Employees	52,941	<b>54,756</b>	3.4%

### Comments

- EBITDA pre & margin reduction reflects LY one-time effects in Healthcare, ongoing LC decline and FX headwinds
- Lower EPS pre in line with EBITDA pre decline
- Operating cash flow driven by business dynamics, LY cash flow reflects positive tax effects
- Working capital reflects strong organic sales growth
- Higher headcount related to growth initiatives in Healthcare and Life Science

# Reported figures

## Reported results

[€m]	9M 2017	9M 2018	Δ
EBIT	2,183	<b>1,386</b>	-36.5%
Financial result	-200	<b>-182</b>	-9.1%
Profit before tax	1,983	<b>1,204</b>	-39.3%
Income tax	-457	<b>-303</b>	-33.6%
<i>Effective tax rate (%)</i>	23.1%	<b>25.2%</b>	
Net income <sup>*</sup>	1,592	<b>928</b>	-41.7%
EPS (€) <sup>*</sup>	3.66	<b>2.13</b>	-41.8%

## Comments

- Lower EBIT reflects LY one-time effects in Healthcare, FX headwinds and LC decline; LY EBIT driven by write-up of Vevey site (~ -€70 m)
- Profit before tax in line with EBIT decrease
- Effective tax rate within guidance range of ~24% to 26%

<sup>\*</sup>From continuing and discontinued operations;  
Totals may not add up due to rounding

# Healthcare: Solid organic sales growth while profitability declines in relation to FX headwinds and LY's substantial favorable one-time effects

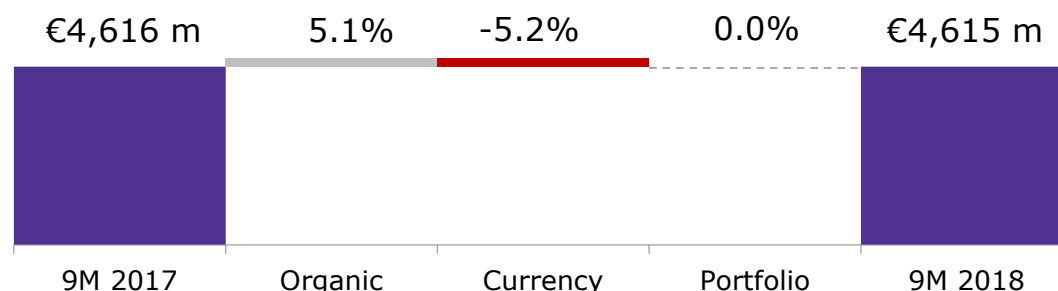
## Healthcare P&L

[€m]	9M 2017	9M 2018
Net sales	4,616	<b>4,615</b>
Marketing and selling	-1,767	<b>-1,714</b>
Administration	-203	<b>-255</b>
Research and development	-1,166	<b>-1,195</b>
EBIT	1,267	<b>541</b>
EBITDA	1,728	<b>1,089</b>
EBITDA pre	1,433	<b>1,141</b>
Margin (in % of net sales)	31.0%	<b>24.7%</b>

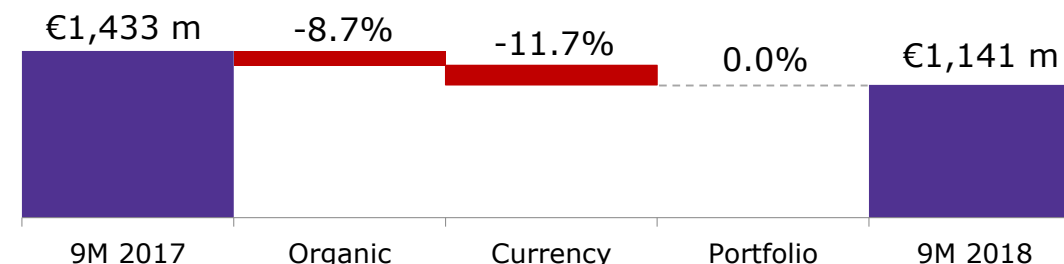
## Comments

- Organic growth supported by strong Fertility and Glucophage; Launches of Mavenclad<sup>®</sup> and Bavencio<sup>®</sup> on track
- Ongoing decline of Rebif<sup>®</sup> due to growing competition in U.S. & EU despite stable market shares in Interferons market in North America, partially offset by Mavenclad<sup>®</sup>
- Erbitux<sup>®</sup> facing ongoing competition and price pressure in major markets
- Lower Marketing & Selling mainly due to favorable FX; higher M&S for Mavenclad<sup>®</sup> and Bavencio<sup>®</sup> offset by lower investment in mature products (esp. Rebif<sup>®</sup> and Erbitux<sup>®</sup>)
- R&D costs increased due to investments on progressing pipeline
- Profitability reflects significant FX headwinds and unfavorable product mix mitigated by Peg-Pal milestone payment (+€50 m); LY included Bavencio<sup>®</sup> Milestone payments and royalty income swap (~€240 m)

## Net sales bridge



## EBITDA pre bridge

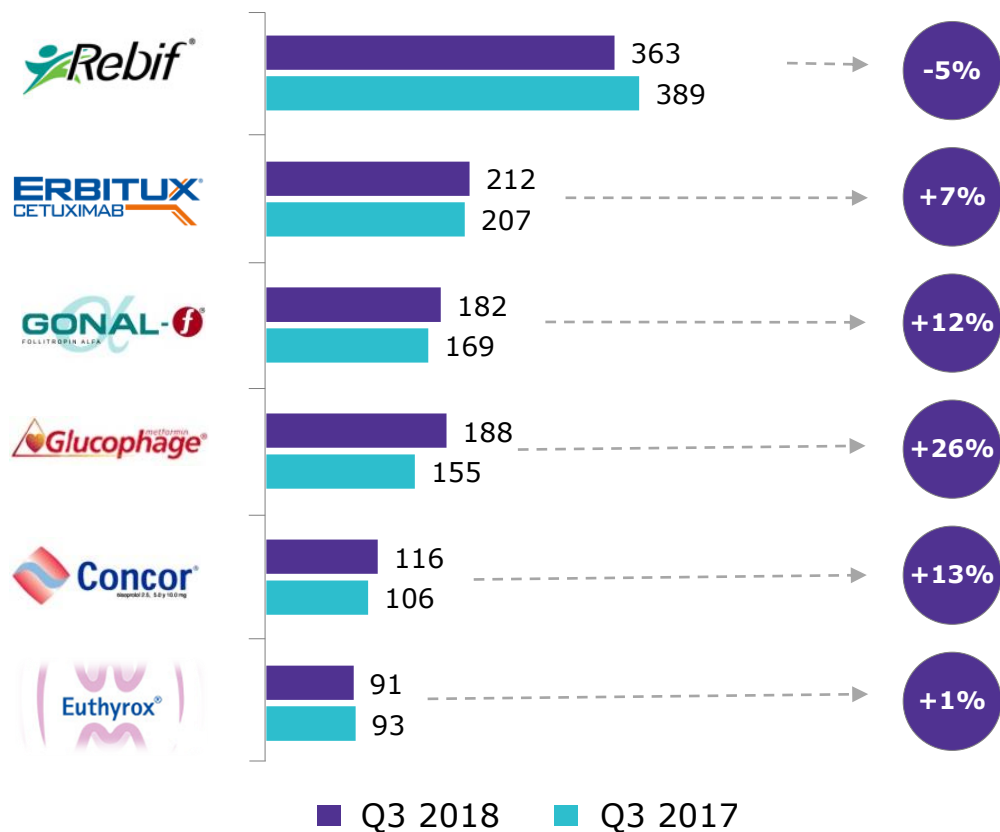


Totals may not add up due to rounding

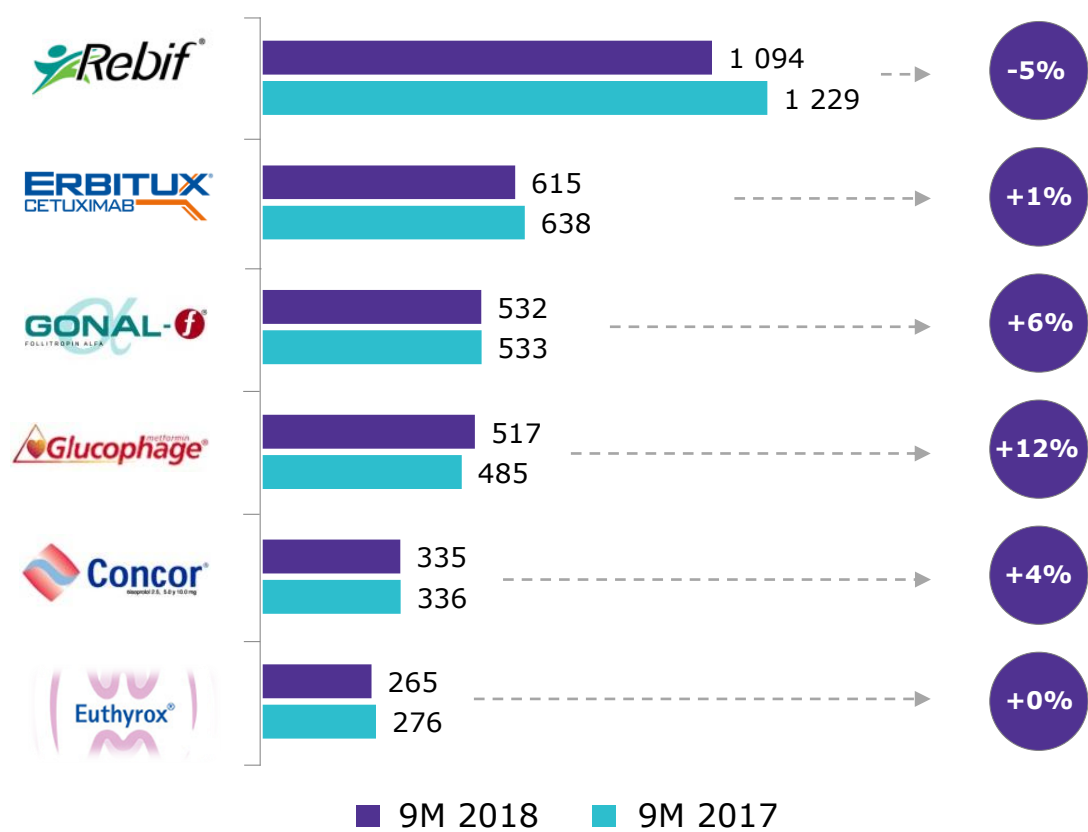


# Healthcare organic growth by franchise/product

Q3 2018 organic sales growth [%]  
by key product [€ m]



9M 2018 organic sales growth [%]  
by key product [€ m]

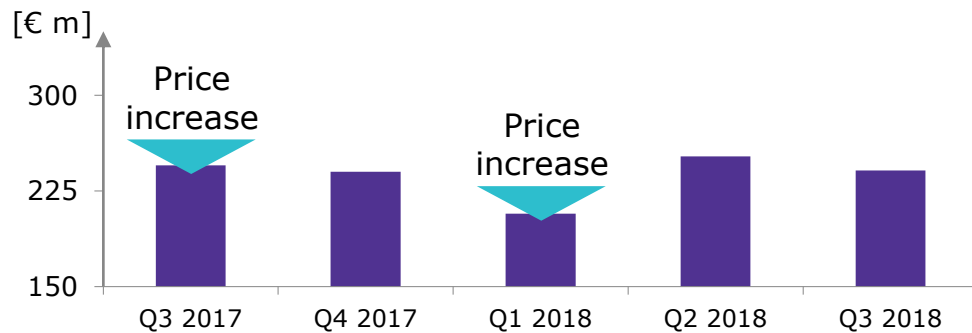


Totals may not add up due to rounding

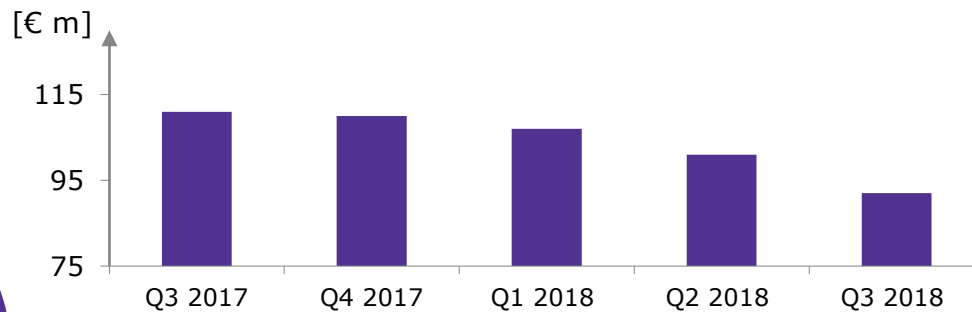
# Rebif<sup>®</sup>: Ongoing decline in line with interferon market

## Rebif<sup>®</sup> sales evolution

### North America



### Europe



## Q3 2018 Rebif<sup>®</sup> performance

### Q3 drivers

-1.8% org.

- Price
- Volume
- FX

- Rebif<sup>®</sup> sales of €363 m in Q3 2018 reflect organic decline of -5.2% and negative FX effect of -1.5% mainly from LATAM

- Market shares within interferons stable due to high retention rates and known long-term track record

- Competitive environment in Europe incl. competition from orals driving ongoing organic decline

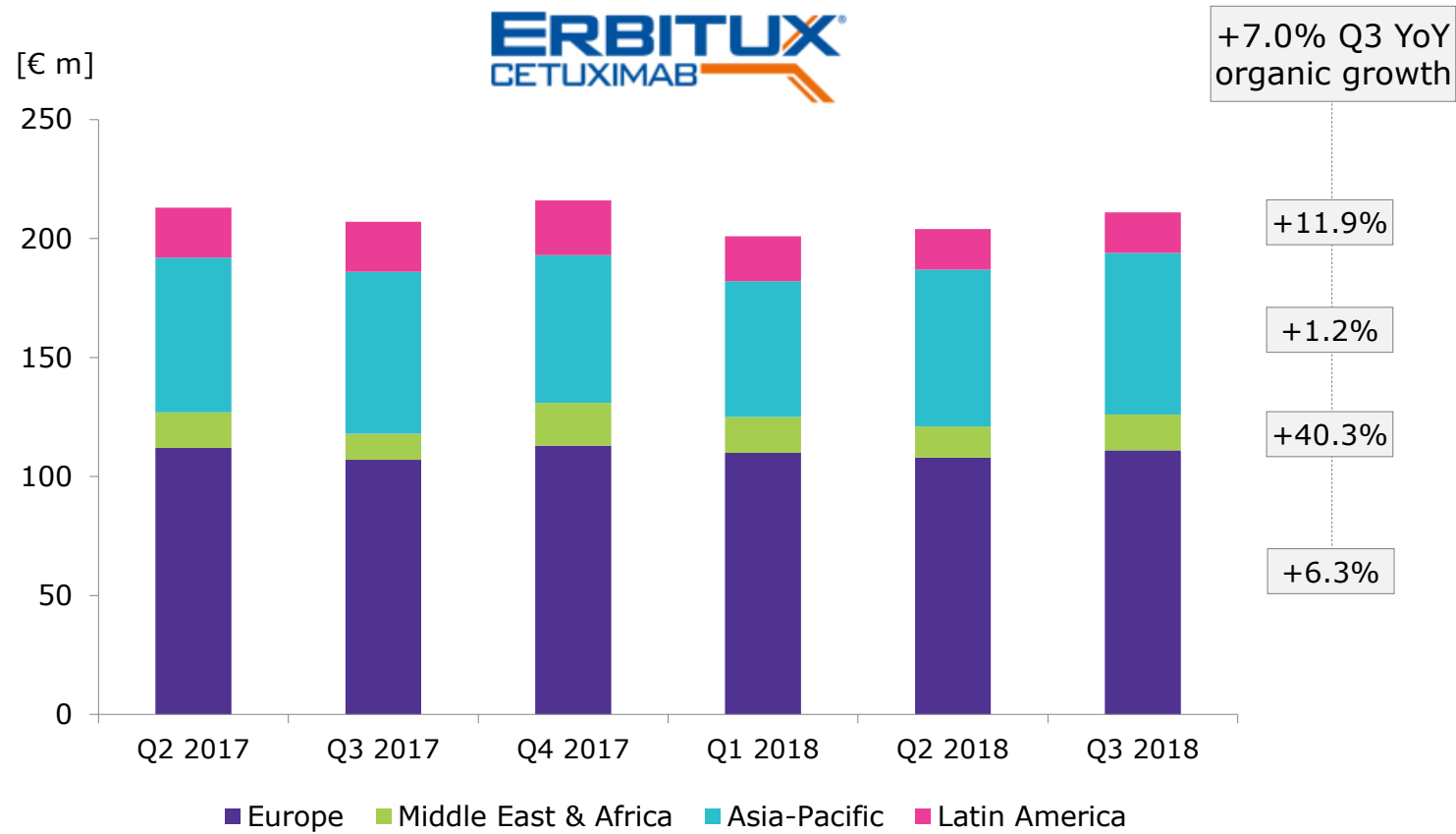
### Q3 drivers

-15.5% org.

- Price
- Volume
- FX

# Erbitux<sup>®</sup>: A challenging market environment

## Erbitux<sup>®</sup> sales by region



## Q3 2018 Erbitux<sup>®</sup> performance

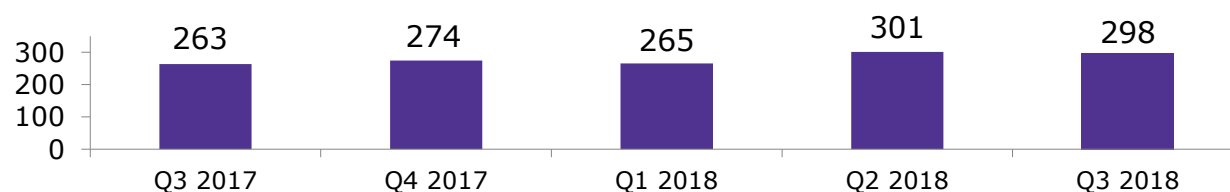
- Absolute sales increase to €212 m due to organic sales growth of +7.0%, mitigated by FX headwinds of -5.0% mainly from LATAM and EU
- Growth in Europe due to tender phasing; still impacted by ongoing competition, price reductions and shrinking market size due to increasing i-onc trials
- APAC about stable mainly driven by increased demand in China
- LATAM strong, and MEA driven by tender phasing due to importation permit

# Solid organic growth of Fertility, General Medicine and Endocrinology

## Sales evolution

### Fertility

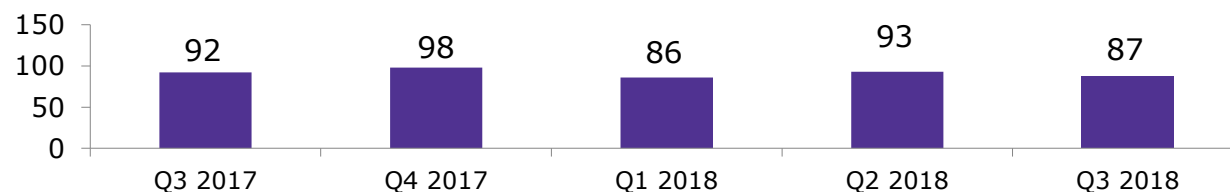
[€ m]



Organic  
+17.9% org.

### Endocrinology

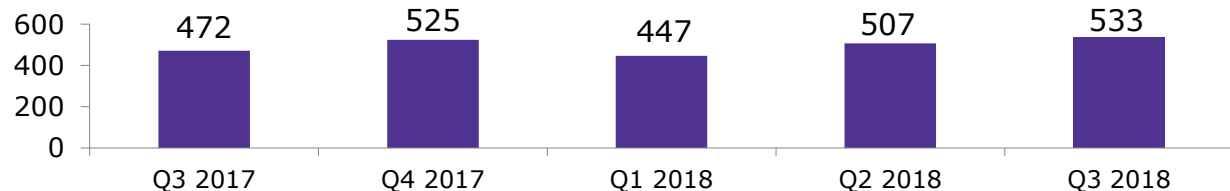
[€ m]



Organic  
-1.1% org.

### General Medicine\*

[€ m]



Organic  
11.9% org.

## Q3 2018 organic drivers

- Fertility with double digit growth across all regions, especially in North America, APAC and Europe
- Gonal-f<sup>®</sup> shows double digit growth, supported by increasing demand in North America and APAC
- Rest of Fertility portfolio shows ongoing strong increases, especially in China and Europe
- General Medicine reflects double digit growth of Glucophage<sup>®</sup> (China & MEA)
- Endocrinology posts slight decline driven by lower demand in U.S., mitigated by growth in APAC, LATAM and EU

\*includes "CardioMetabolic Care & General Medicine and Others

# Healthcare Strategy

## The Healthcare Pipeline continues to deliver

November 5, 2018

### Phase I

**M2698**  
**p70S6K & Akt inhibitor**  
Solid tumors

**M3814**  
**DNA-PK inhibitor**  
Solid tumors

**M6620 (VX-970)**  
**ATR inhibitor**  
Solid tumors

**M4344 (VX-803)**  
**ATR inhibitor**  
Solid tumors

**M3541**  
**ATM inhibitor**  
Solid tumors

**M8891**  
**MetAP2 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/TGFBeta trap**  
Solid tumors

**M6495**  
**anti-ADAMTS-5 nanobody**  
Osteoarthritis

**M5049**  
**Immune receptor inhibitor**  
Immunology

**M5717**  
**PeEF2 inhibitor**  
Malaria

### Phase II

**tepotinib**  
**MET kinase inhibitor**  
Non-small cell lung cancer

**tepotinib**  
**MET kinase inhibitor**  
Hepatocellular cancer

**avelumab**  
**anti-PD-L1 mAb**  
Merkel cell cancer 1L<sup>1</sup>

**avelumab**  
**anti-PD-L1 mAb**  
Solid tumors<sup>2</sup>

**avelumab**  
**anti-PD-L1 mAb**  
Non-small cell lung cancer<sup>2</sup>

**avelumab**  
**anti-PD-L1 mAb**  
Urothelial cancer<sup>2</sup>

**abrituzumab<sup>3</sup>**  
**pan-αv integrin inhibiting mAb**  
Colorectal cancer 1L<sup>1</sup>

**M7824**  
**anti-PD-L1/TGFBeta trap**  
Non-small cell lung cancer 1L<sup>1</sup>

**sprifermin**  
**fibroblast growth factor 18**  
Osteoarthritis

**atacept**  
**anti-BlyS/APRIL fusion protein**  
Systemic lupus erythematosus

**atacept**  
**anti-BlyS/APRIL fusion protein**  
IgA nephropathy

**evobrutinib**  
**BTK inhibitor**  
Rheumatoid arthritis

**evobrutinib**  
**BTK inhibitor**  
Systemic lupus erythematosus

**M1095 (ALX-0761)<sup>4</sup>**  
**anti-IL-17 A/F nanobody**  
Psoriasis

**evobrutinib**  
**BTK inhibitor**  
Multiple sclerosis

### Phase III

**avelumab - anti-PD-L1 mAb**  
Non-small cell lung cancer 1L<sup>1</sup>

**avelumab - anti-PD-L1 mAb**  
Gastric cancer 1L-M<sup>1M</sup>

**avelumab - anti-PD-L1 mAb**  
Ovarian cancer platinum resistant/refractory

**avelumab - anti-PD-L1 mAb**  
Ovarian cancer 1L<sup>1</sup> and 1L-M<sup>1M</sup>

**avelumab - anti-PD-L1 mAb**  
Ovarian cancer 1L<sup>1,5</sup>

**avelumab - anti-PD-L1 mAb**  
Urothelial cancer 1L-M<sup>1M</sup>

**avelumab - anti-PD-L1 mAb**  
Renal cell cancer 1L<sup>1</sup>

**avelumab - anti-PD-L1 mAb**  
Locally advanced head and neck cancer

### Registration

**cladribine tablets**  
**lymphocyte-targeting agent**  
Relapsing multiple sclerosis<sup>6</sup>

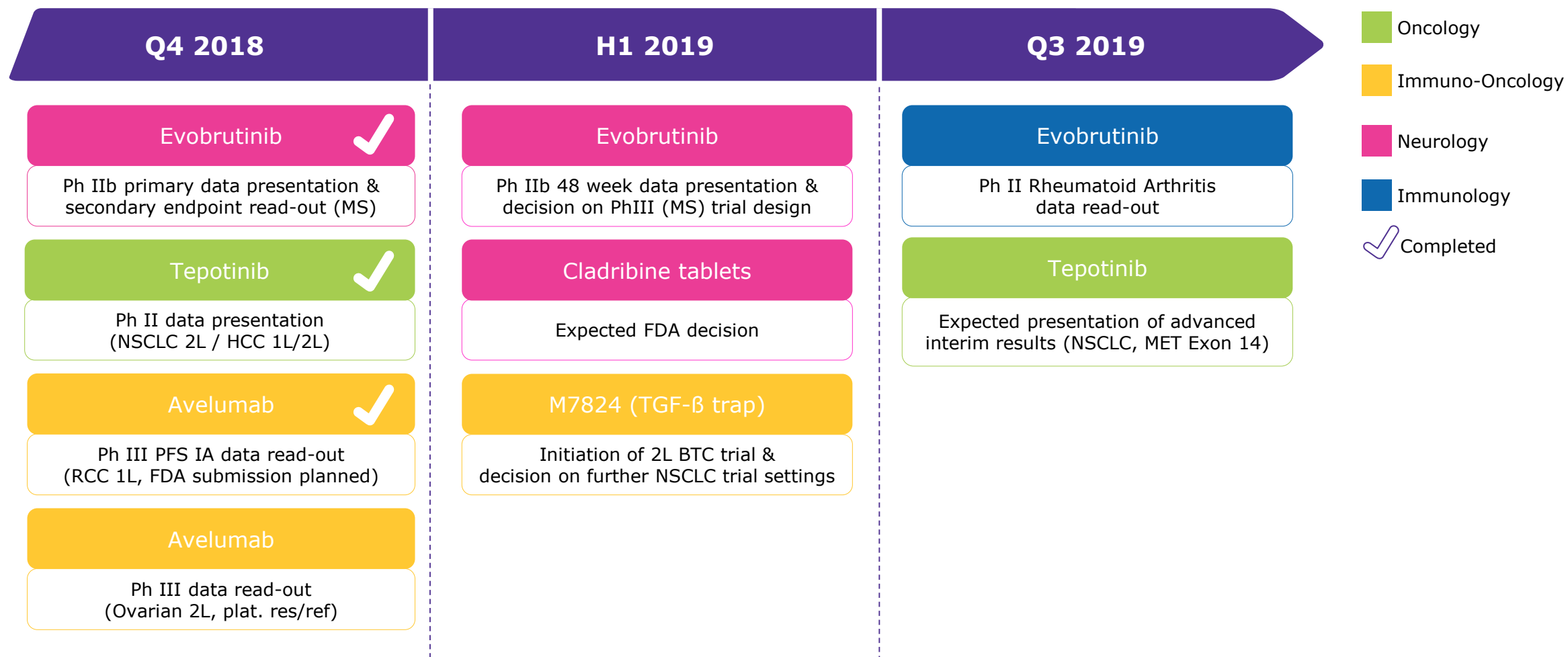
- Oncology
- Immuno-Oncology
- Immunology
- Neurology
- Global Health

<sup>1</sup> First-line treatment; <sup>1M</sup> First-line maintenance treatment. <sup>2</sup> Avelumab combination studies with talazoparib, axitinib, ALK inhibitors, chemotherapy, or novel immunotherapies. <sup>3</sup> As announced on May 2 2018, in an agreement with SFJ Pharmaceuticals Group, abrituzumab will be developed by SFJ for colorectal cancer through Phase II/III clinical trials. <sup>4</sup> As announced on March 30 2017, in an agreement with Avillion, anti-IL-17 A/F nanobody will be developed by Avillion for plaque psoriasis and commercialized by Merck KGaA, Darmstadt, Germany. <sup>5</sup> Avelumab in combination with talazoparib. <sup>6</sup> As announced on July 30 2018, the US Food and Drug Administration (FDA) has accepted the resubmission of the New Drug Application (NDA) for cladribine tablets.

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.

# Recent & upcoming catalysts

## An eventful Q4 and a year of continued pipeline development ahead<sup>1</sup>



<sup>1</sup>Note: All timelines are event-driven and may be subject to change; Acronyms: NSCLC – Non small cell lung cancer | MS – Multiple Sclerosis | RCC – Renal Cell Carcinoma | HCC – Hepatocellular Carcinoma | plat. res/ref – platinum resistant/refractory | FDA – U.S. Food and Drug Administration | IA – Interim Analysis

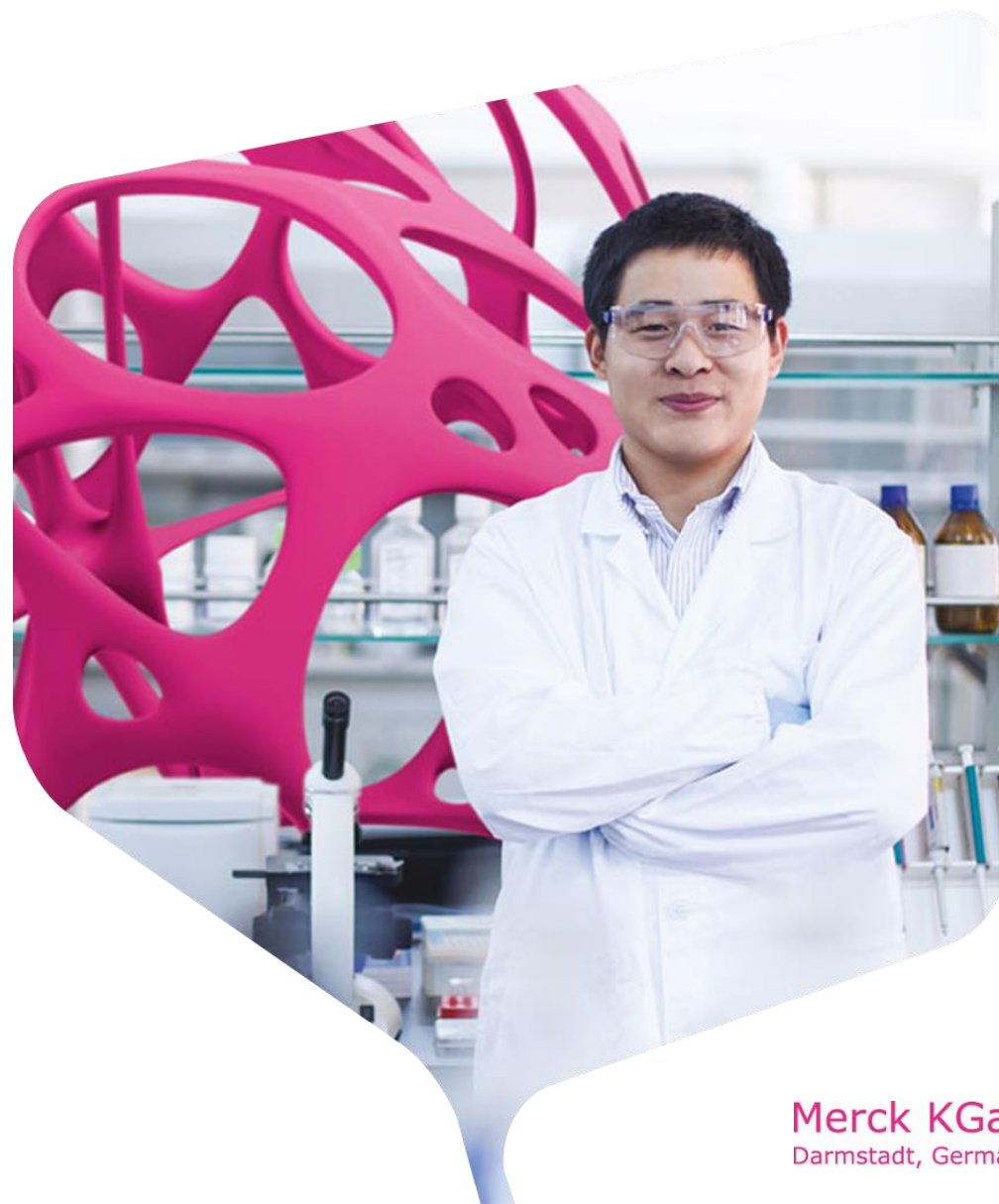
# Adjustments in Q3 2018

## Adjustments in EBIT

[€m]	Q3 2017		Q3 2018	
	Adjustments	thereof D&A	Adjustments	thereof D&A
Healthcare	-327	-17	9	0
Life Science	24	0	16	5
Performance Materials	2	0	1	0
Corporate & Other	29	0	23	0
Total	-271	-17	49	5

## Financial calendar

Date	Event
March 7, 2019	FY 2018 Earnings release
April 26, 2019	Annual General Meeting
May 14, 2019	Q1 2019 Earnings release
August 8, 2019	Q2 2019 Earnings release





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