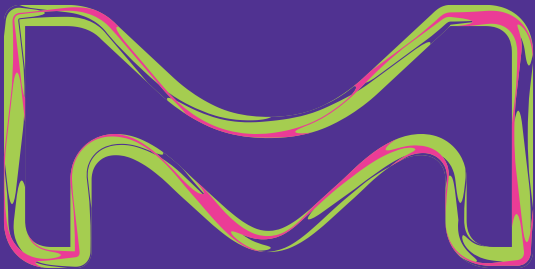




# **MERCK KGAA, DARMSTADT, GERMANY — Q4 2018 ROADSHOW**

Investor Relations

March 2019





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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 – Maintaining leadership and innovation**
- 06 Executive summary and guidance**



01

## **BUSINESS OVERVIEW**

## Group

# Three high-tech businesses competing in attractive markets



### Healthcare

#### Leading in specialty pharma markets

- Biologics and small-molecule **prescription medicines** against cancer, multiple sclerosis, infertility
- **Research** focus: Oncology, Immunology & Immuno-Oncology
- **Successful portfolio management:** e.g. divestment of Consumer Health business



### Life Science

#### Leading life science company

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



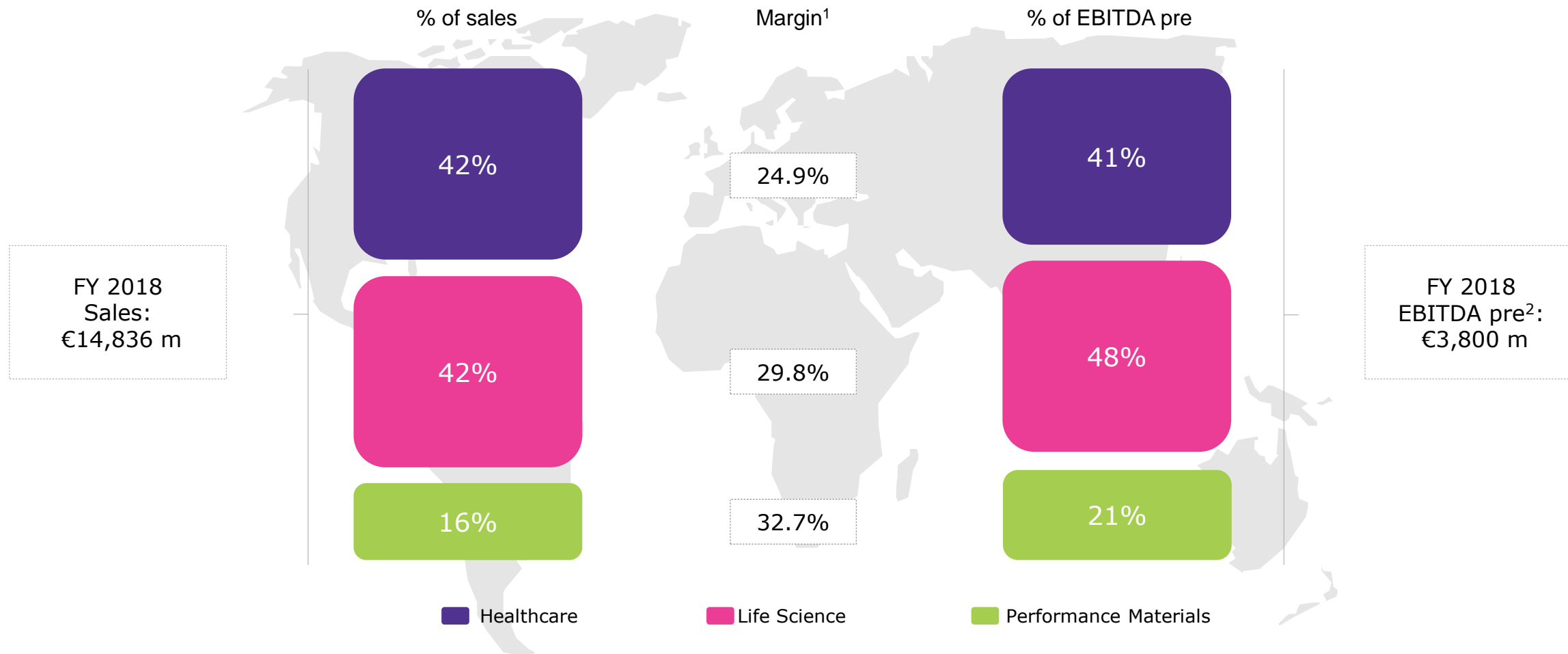
### Performance Materials

#### 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



<sup>1</sup>EBITDA pre margin in % of net sales; <sup>2</sup>Including Corporate/Others (-€382 m)

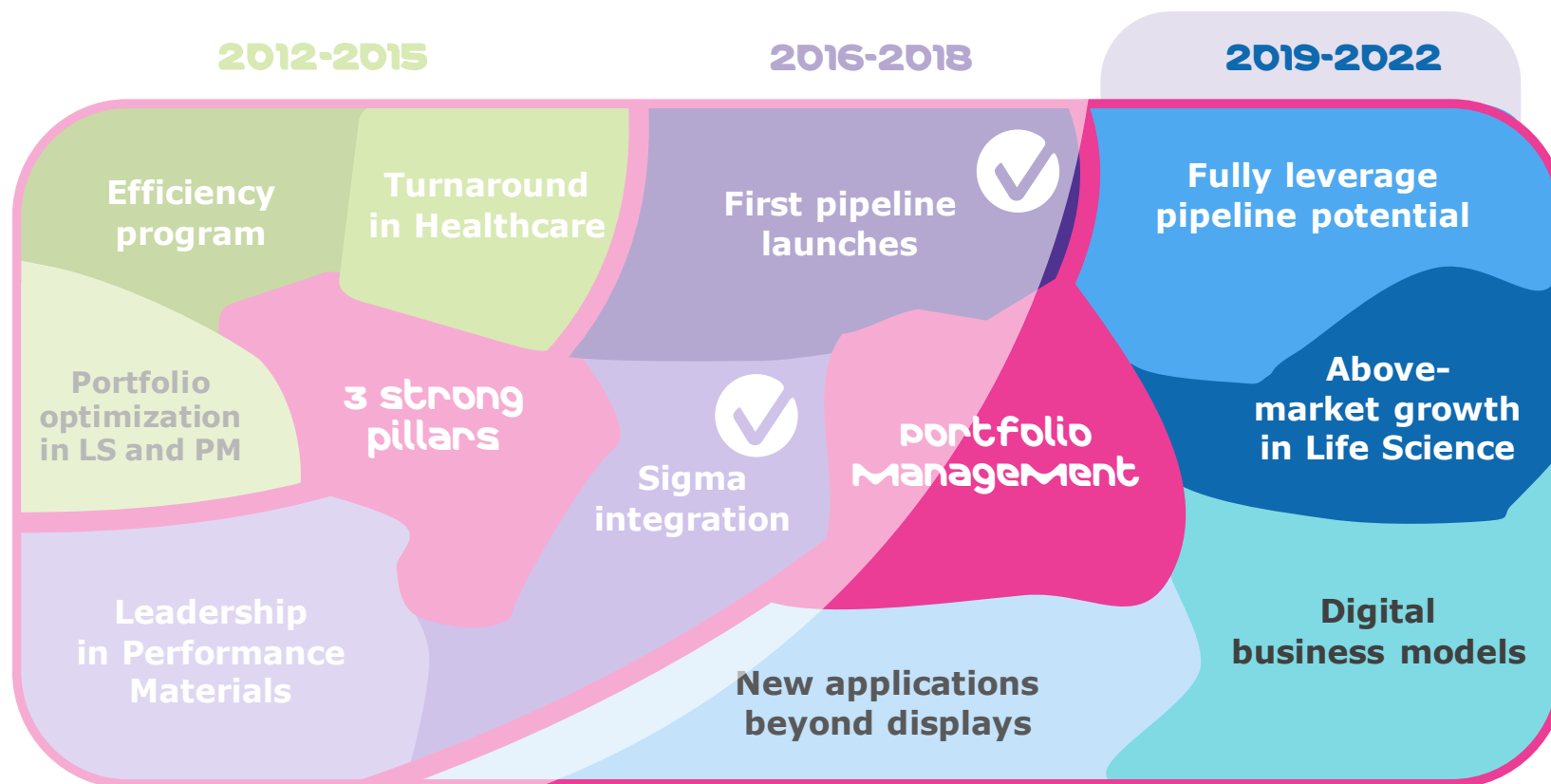




## 02 TRANSFORMING THE COMPANY

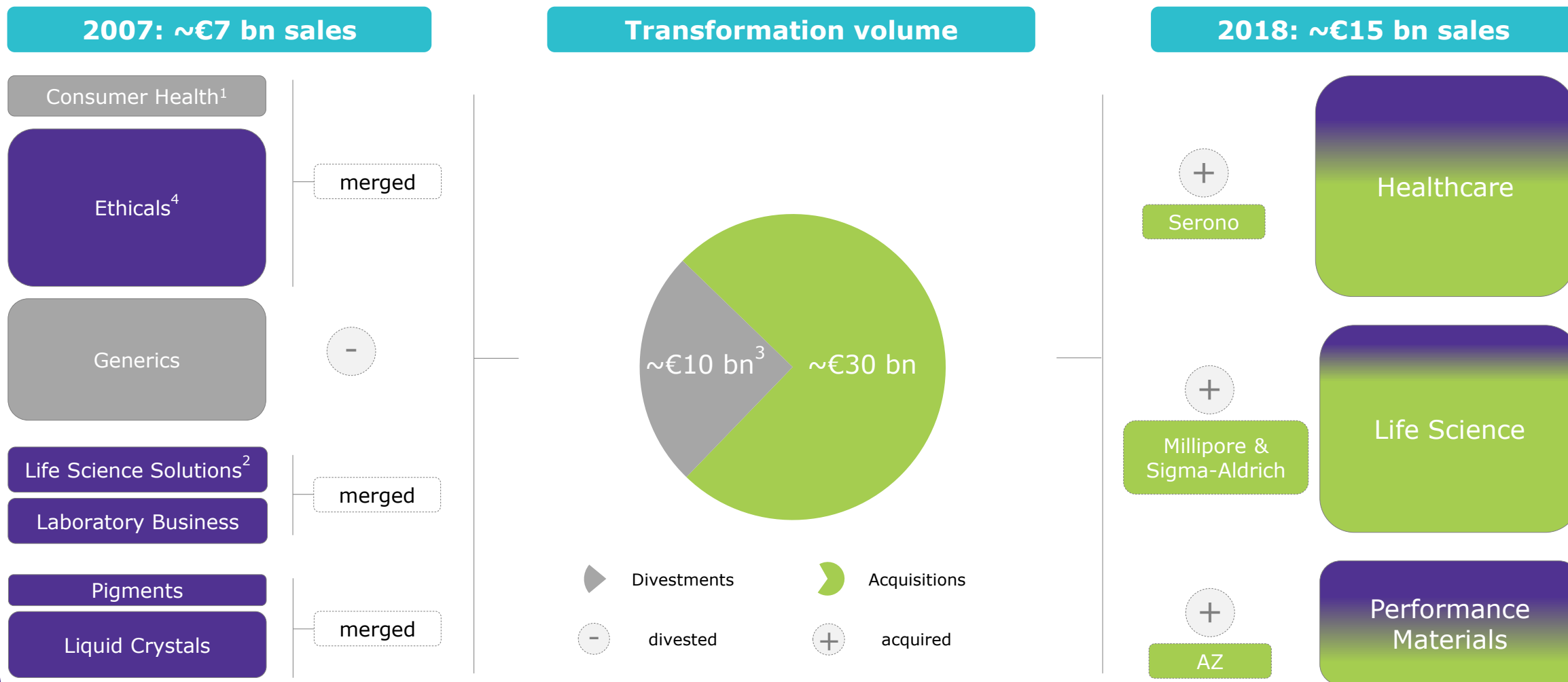
# Group

## Strategic roadmap 2016-2022



## Group

We have added scale and strengthened the attractiveness of our portfolio

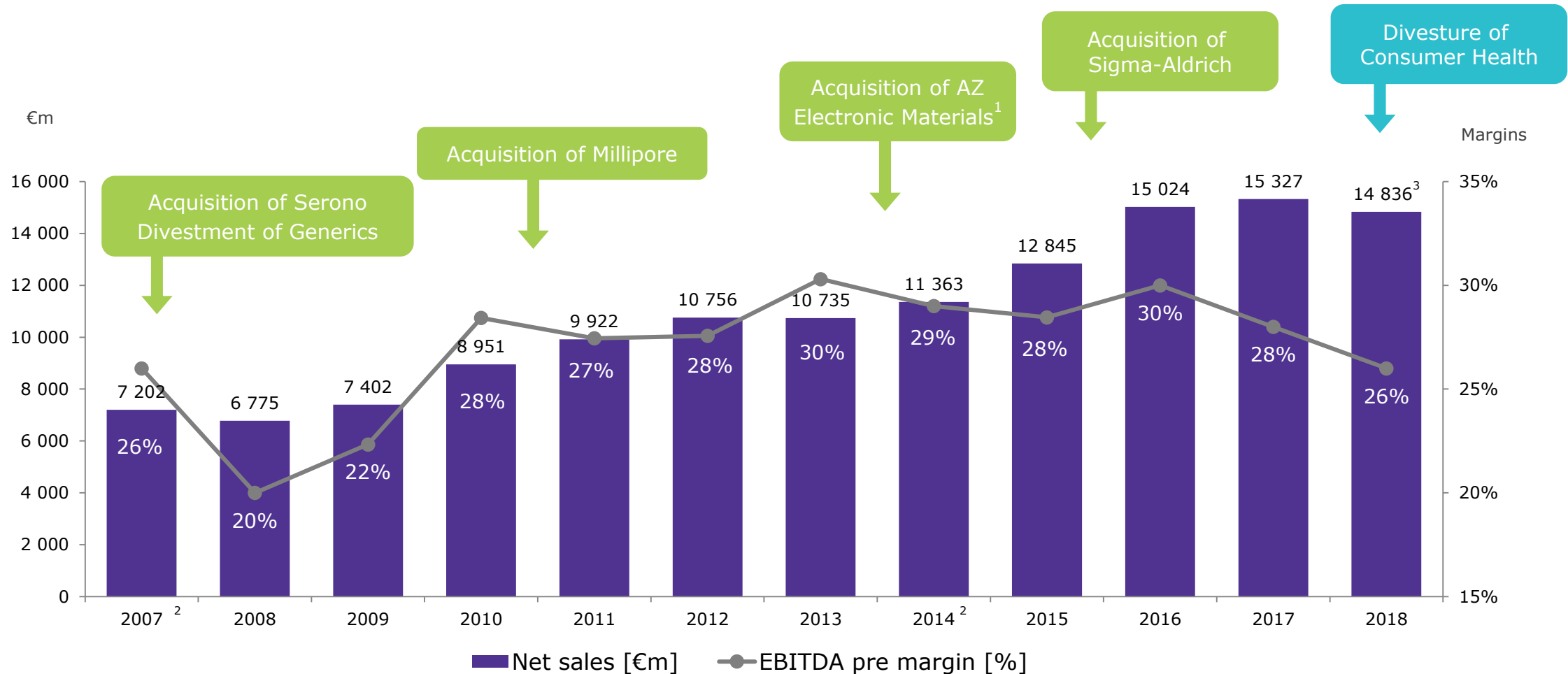


<sup>1</sup>Closing of sale of Consumer Health at a cash purchase price of € 3.4 billion completed as of December 1 2018; <sup>2</sup>Excluding "Crop Bioscience", which was divested;

<sup>3</sup>Profroma divestment volume includes cash proceeds for Consumer Health <sup>4</sup>Excluding "Theramex", which was divested;

## Group

# Continue to transform to a science and technology focused company



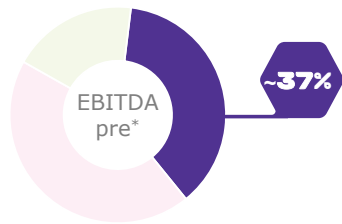
<sup>1</sup>Included since 2 May 2014; <sup>2</sup>2007 and 2014 EBITDA pre margin adjusted for comparability; <sup>3</sup>2018 net sales reflect Consumer Health divestiture (reduction of ~ €1 bn net sales p.a.)

# Group

## Clear set of priority goals



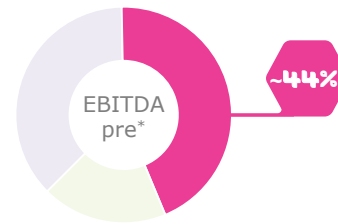
### Healthcare



- Deliver on ambition to keep core business at least stable until 2022
- Transition from investment to earnings phase by 2019
- Foster successful Bavencio<sup>®</sup> and Mavenclad<sup>®</sup> ramp up
- Stringent pipeline execution



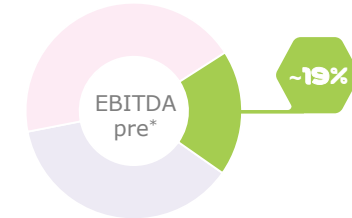
### Life science



- Strengthen position as differentiated player in a highly attractive market
- Maintain consistent above-market growth trajectory and superior profitability
- Implement dynamic strategy for future profitable growth



### Performance Materials



- Deliver on growth ambition of 2-3% CAGR
- Implement 5-year transformation program
- Ensure efficient resource allocation to reach financial ambition of 30% margin
- Maintain strong cash generation and cash conversion

\*based on FY 2018 reported EBITDA pre, excluding Corporate & Other

## Group

# Strategic capital allocation until 2022 newly defined

### portfolio guardrails

- Three balanced pillars with no business marginalized
- Leading market positions in attractive markets
- Clear portfolio roles assigned

### Defining portfolio criteria

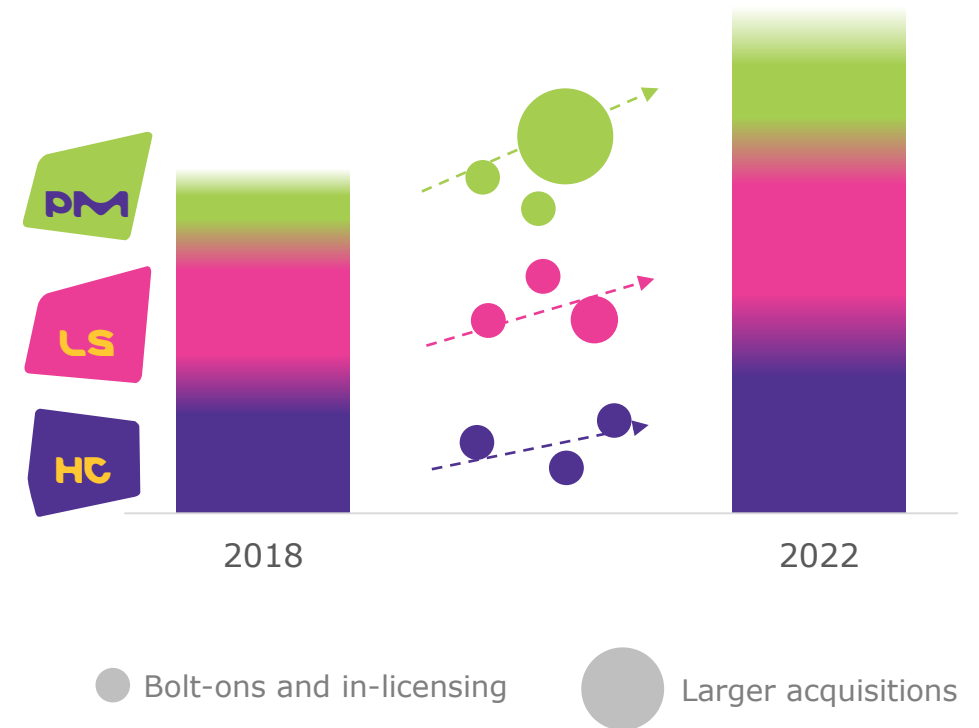
- Market attractiveness & capabilities
- Best strategic owner
- Risk profile

### clear financial M&A criteria

- $IRR > WACC$
- EPS pre accretive
- Maintain investment-grade credit rating

**Regular portfolio review and disciplined capital allocation will continue to ensure sufficiently diversified and value-creating structure of three strong pillars**

### Illustration Merck's KGaA, Darmstadt, Germany sales and earnings drivers





# 03 **HEALTHCARE**

Funding for success

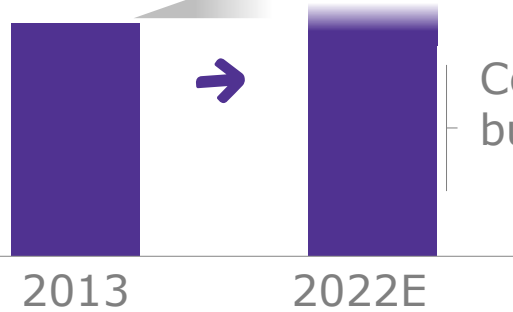
# Healthcare

## Healthcare is on track to deliver on promising pipeline candidates

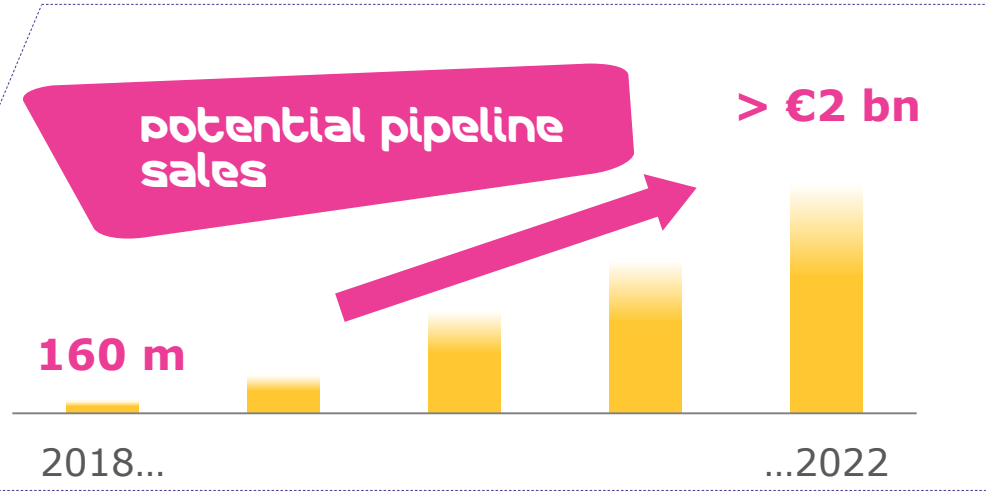
Focus on  
the  
pipeline



Pipeline  
products



Core  
business



ERBITUX®  
CETUXIMAB

Rebif®

Glucophage®  
metformin

Euthyrox®

Concor®

saizen®  
Somatropin r-hGH

GONAL-f®  
FOLLITROPIN ALFA

Pergoveris®

OVITRELLE®  
choriogonadotropin alfa

Cetrotide®  
CETRORELIN

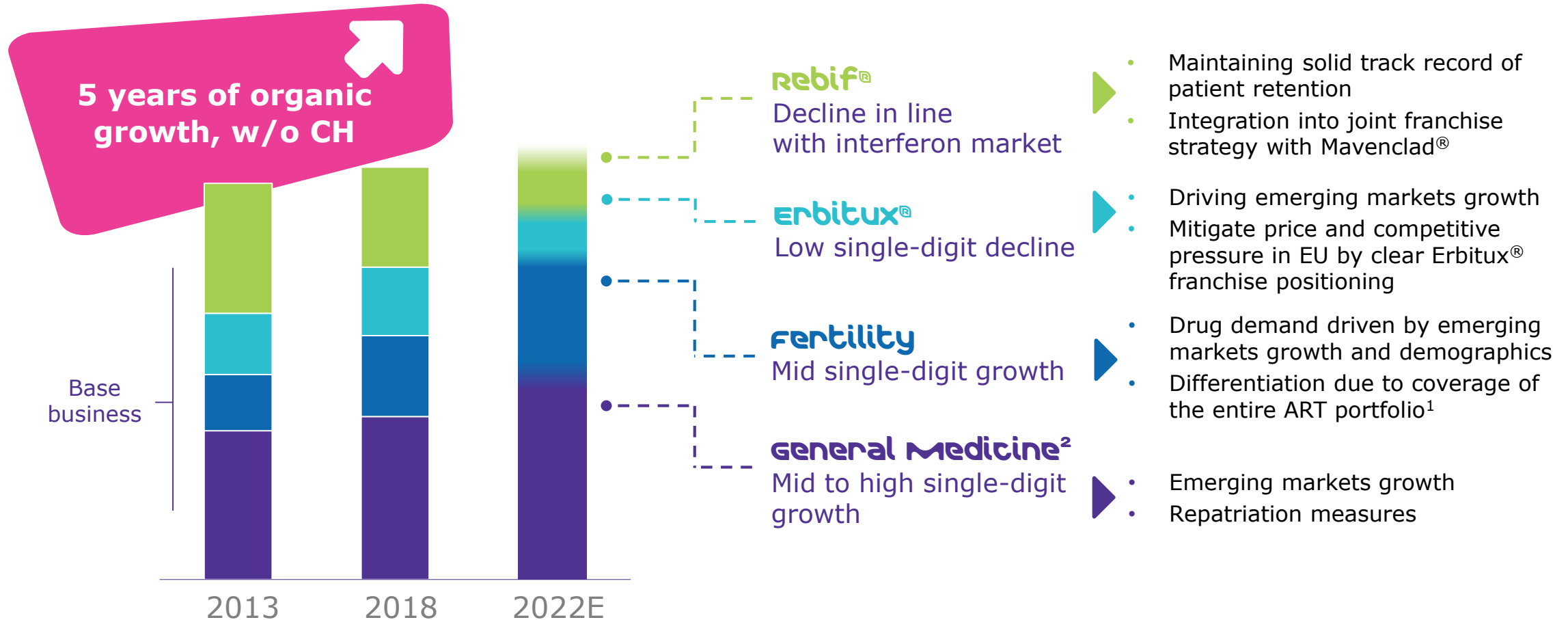
Crinone®  
progesterone gel 8%



# Healthcare

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

### Healthcare core business net sales until 2022



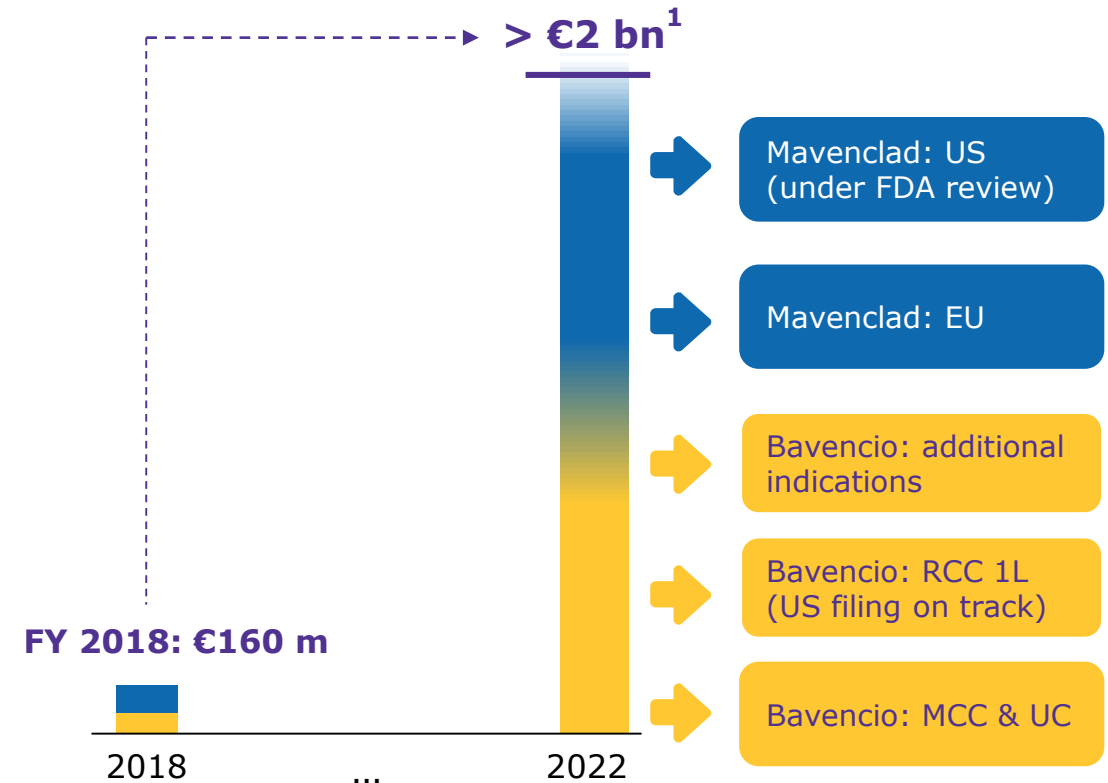
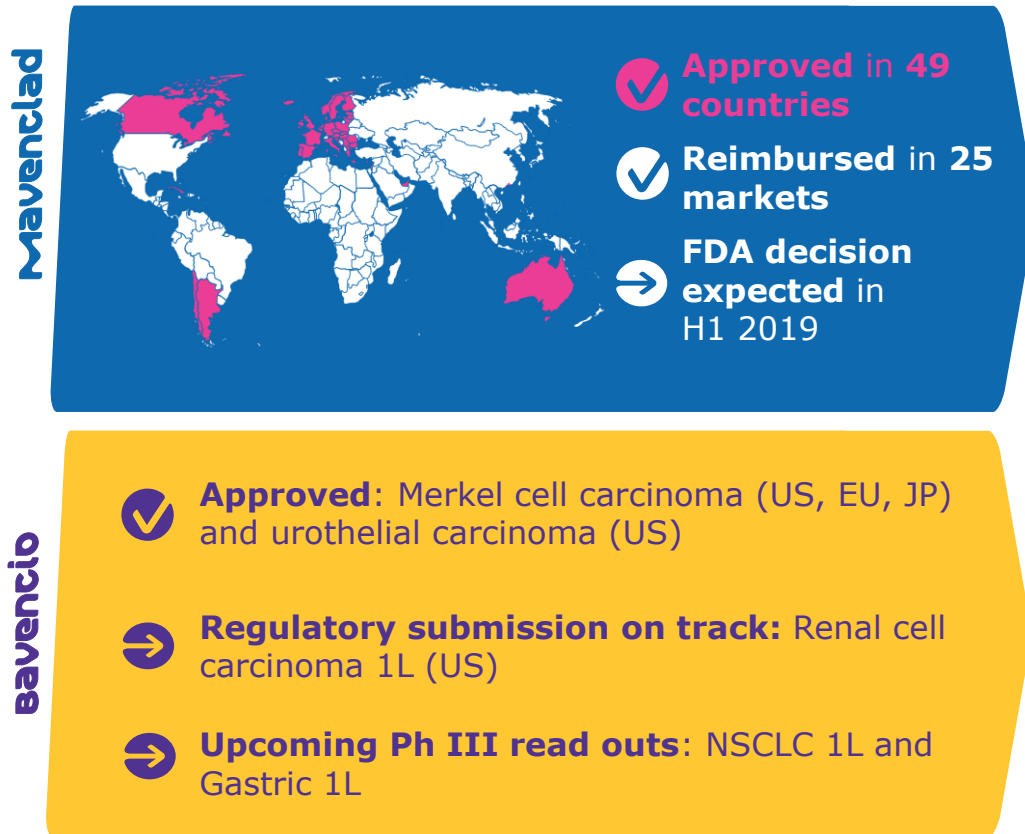
<sup>1</sup>ART: Assisted Reproductive Technology; <sup>2</sup>includes General Medicine, CardioMetabolic Care (CMC), Endocrinology & Allergopharma

# Healthcare

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

Global launches gaining traction ...

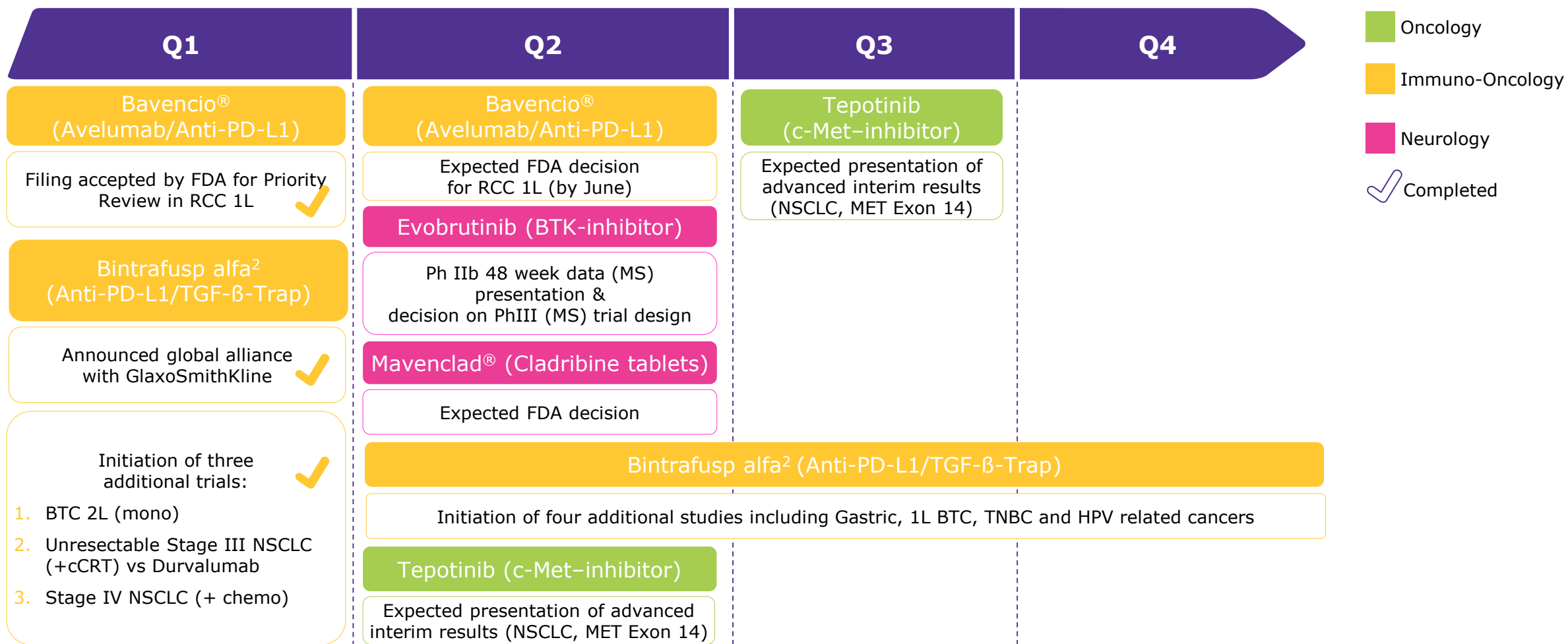
... and supporting €2 bn pipeline sales ambition



<sup>1</sup> Indication: risk adjusted, composition is illustrative and may change subject to data read-outs and registrational outcomes; Acronyms: RCC = Renal cell carcinoma | MCC = Merkel cell carcinoma | UC = Urothelial carcinoma | NSCLC = Non small cell lung cancer

# Recent & upcoming catalysts

## 2019 - A year of continued pipeline development<sup>1</sup>



- Oncology
- Immuno-Oncology
- Neurology
- ✓ Completed

<sup>1</sup>Note: All timelines are event-driven and may be subject to change; <sup>2</sup> proposed International Nonproprietary Name (INN); Acronyms: NSCLC – Non small cell lung cancer | MS – Multiple Sclerosis | RCC – Renal Cell Carcinoma | 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

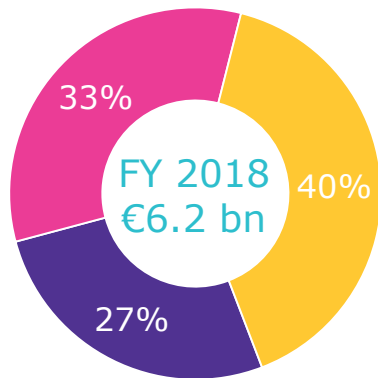
\*Source: Merck KGaA, Darmstadt, Germany estimate 2018

# Life Science

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

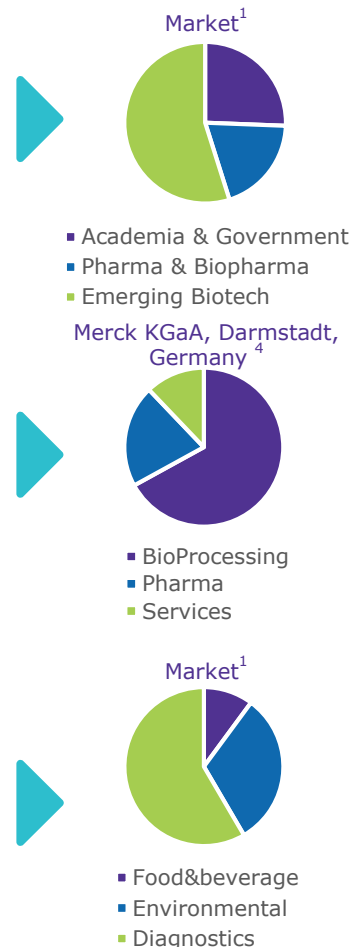
Merck KGaA, Darmstadt,  
Germany Life Science

**Research Solutions**  
Low single digit growth



**Process Solutions**  
High single digit growth

**Applied Solutions**  
Mid single digit growth



### 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 ~11-15% p.a. for 2018-2024 driven by new molecules and biosimilars
  - **Diversification:** contribution by top 10 molecules will decline to ~20% until 2024 from 60% 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

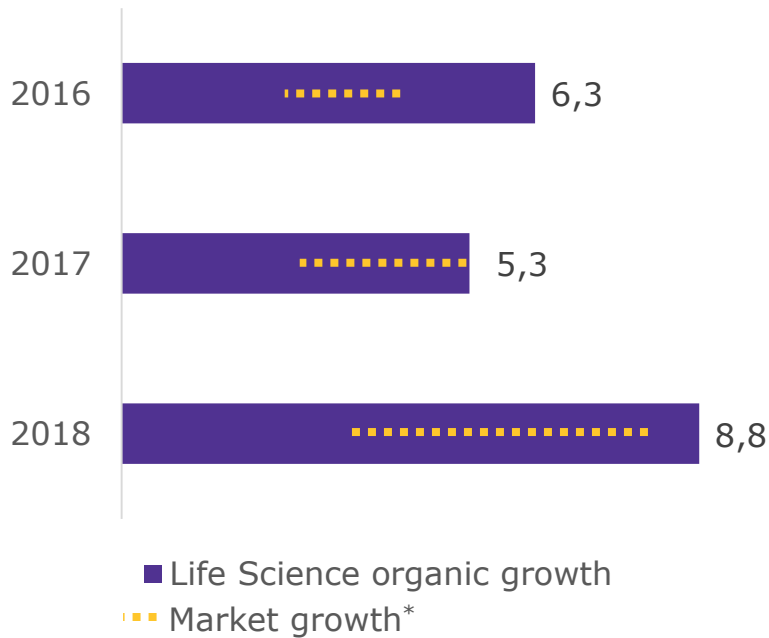
<sup>1</sup>Source: Merck KGaA, Darmstadt, Germany Factbook; <sup>2</sup>Source: PhRMA; <sup>3</sup>CRO = Contract Research Organization; <sup>4</sup>Indicative only; <sup>5</sup>mAbs = monoclonal antibodies; <sup>6</sup>Source: EvaluatePharma September 2018

# Life Science

## Market leading growth and profitability maintained during integration

### Consistent above-market growth

Organic sales growth vs market\* [% YoY]



**Ambition to grow above market through to 2022**

### Key industry player

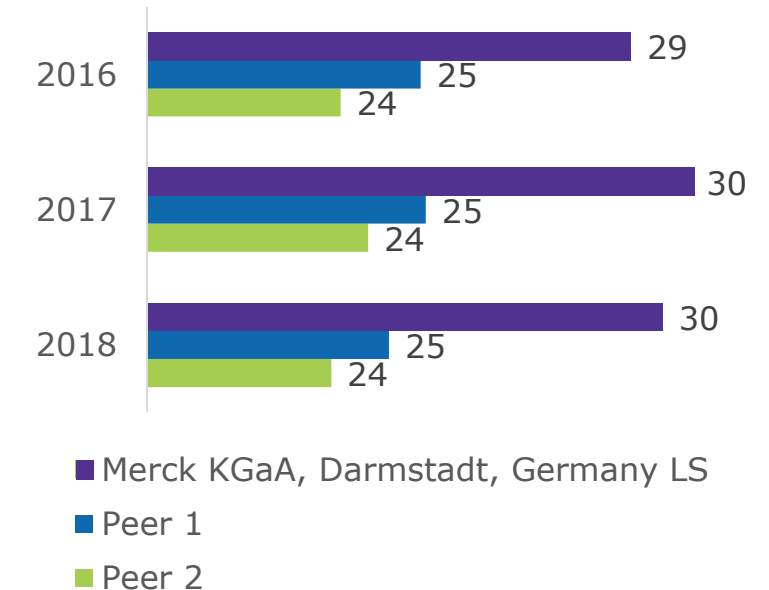
Life Science net sales [€m]



**Secure leading market position**

### Superior profitability

EBITDA pre margin [%]



**Maintaining industry-leading margin**

\*Based on integrated life science peers' performance, analyst reports and Laboratory Products Association report

## Portfolio and focus are key drivers of above-market growth

### Life Science net sales organic CAGR 2015-2018\*

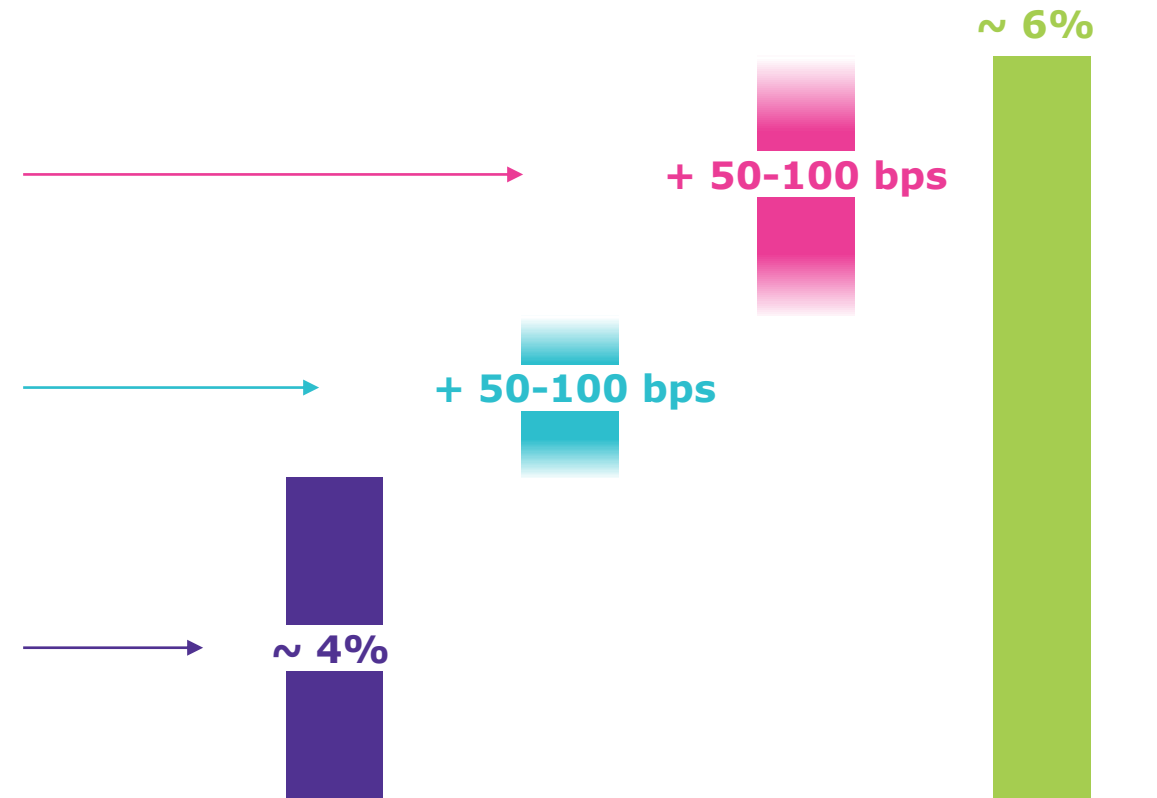
#### Out-Performance

#### Portfolio advantage

- Merck KGaA, Darmstadt, Germany grows within the relevant market segments
- Broad range of differentiated products and services
- E-commerce platform
- Merck KGaA, Darmstadt, Germany focuses on higher-growth segments of the market
- E.g. bioprocessing, lab water, diagnostics offerings

#### Life science market

- The life science industry grows rapidly and develops dynamically



\*Indication

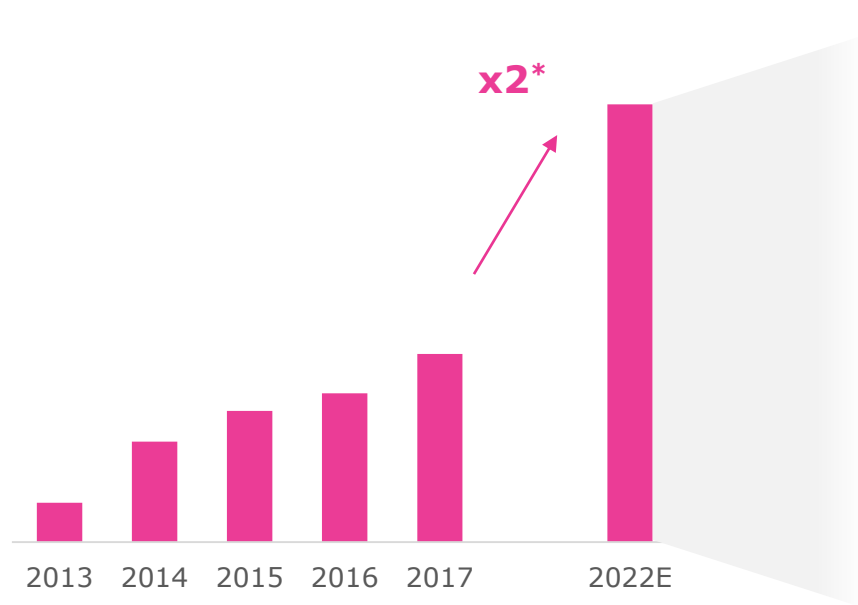


## Life Science

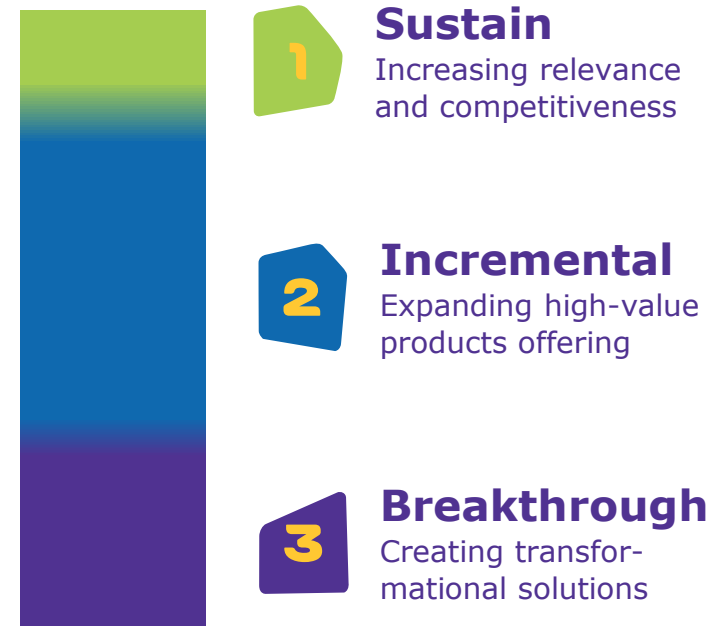
# Innovation underpins Life Science's position as growth engine for us

### Products launched after 2013

% of total net sales



### Categories of innovation



### Industry trends

Customer requirements, scientific standards and therapies are evolving continuously

Our strong and innovative portfolio ensures well-balanced strategic growth

**Innovation pipeline is key to differentiate in the market in order to sustain Life Science's above-market growth trajectory**

\*Indication



05

## **PERFORMANCE MATERIALS**

Maintaining leadership and innovation

# Performance Materials

## A leading player in the electronic materials market

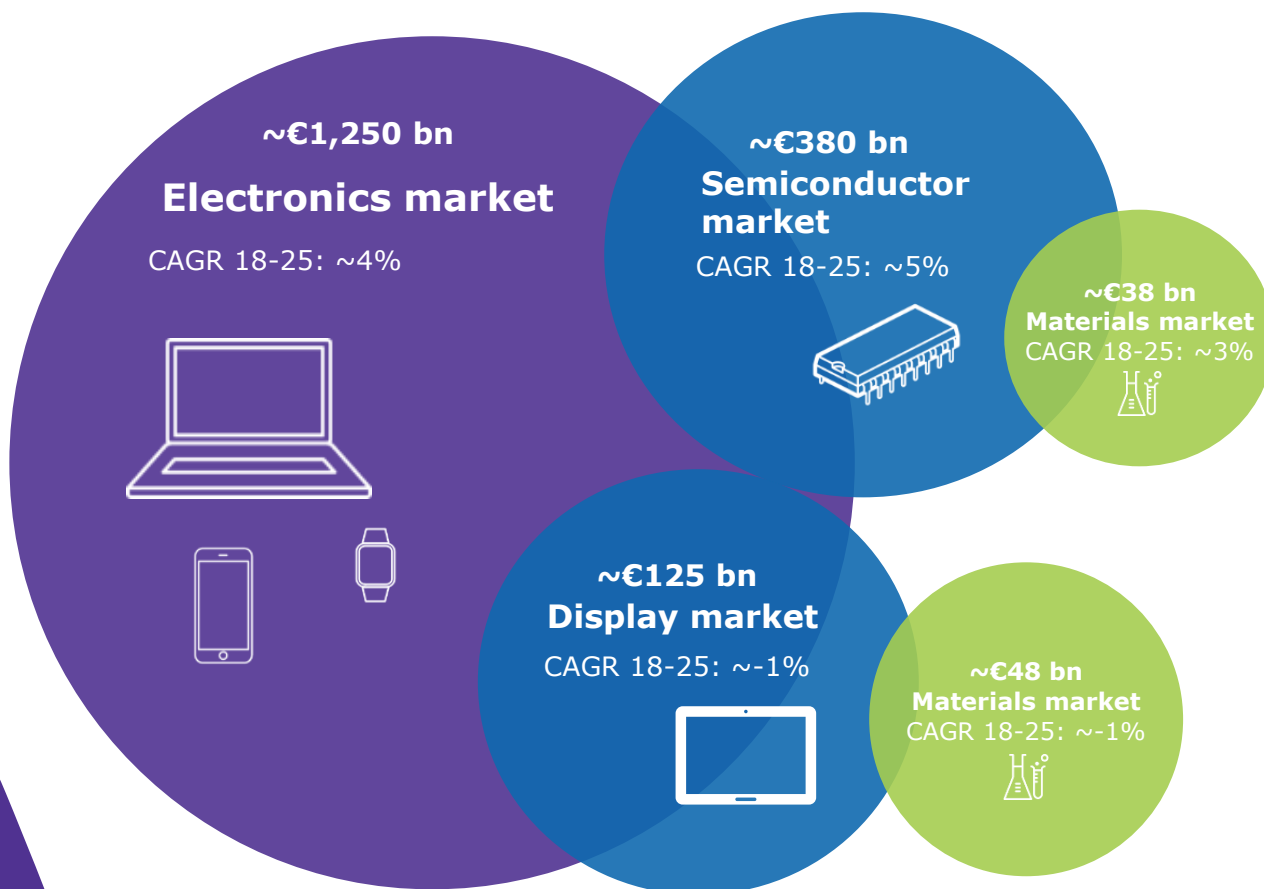
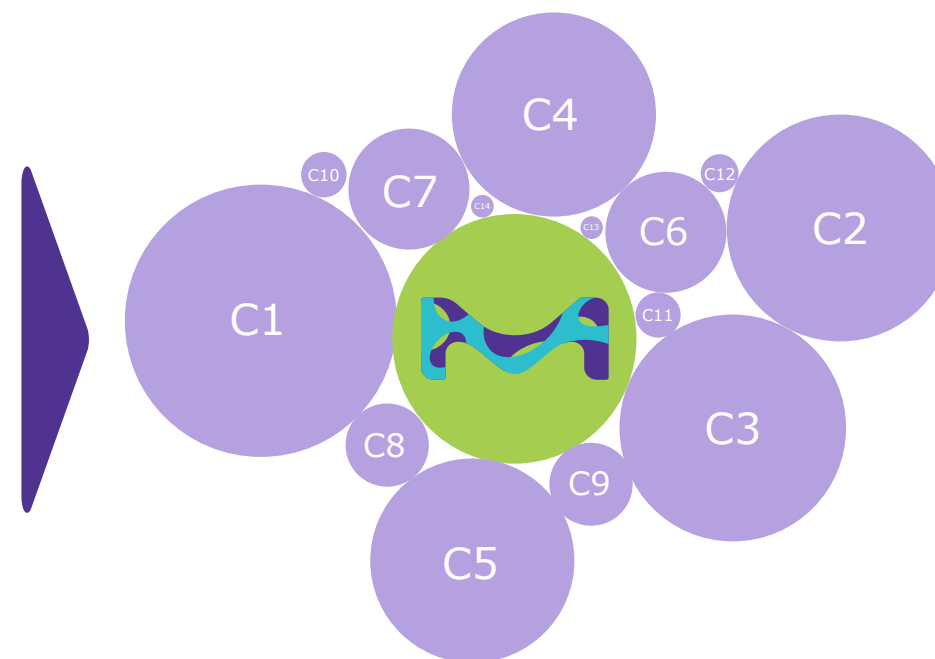


Illustration of the electronics market and thereof its selected sub markets

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



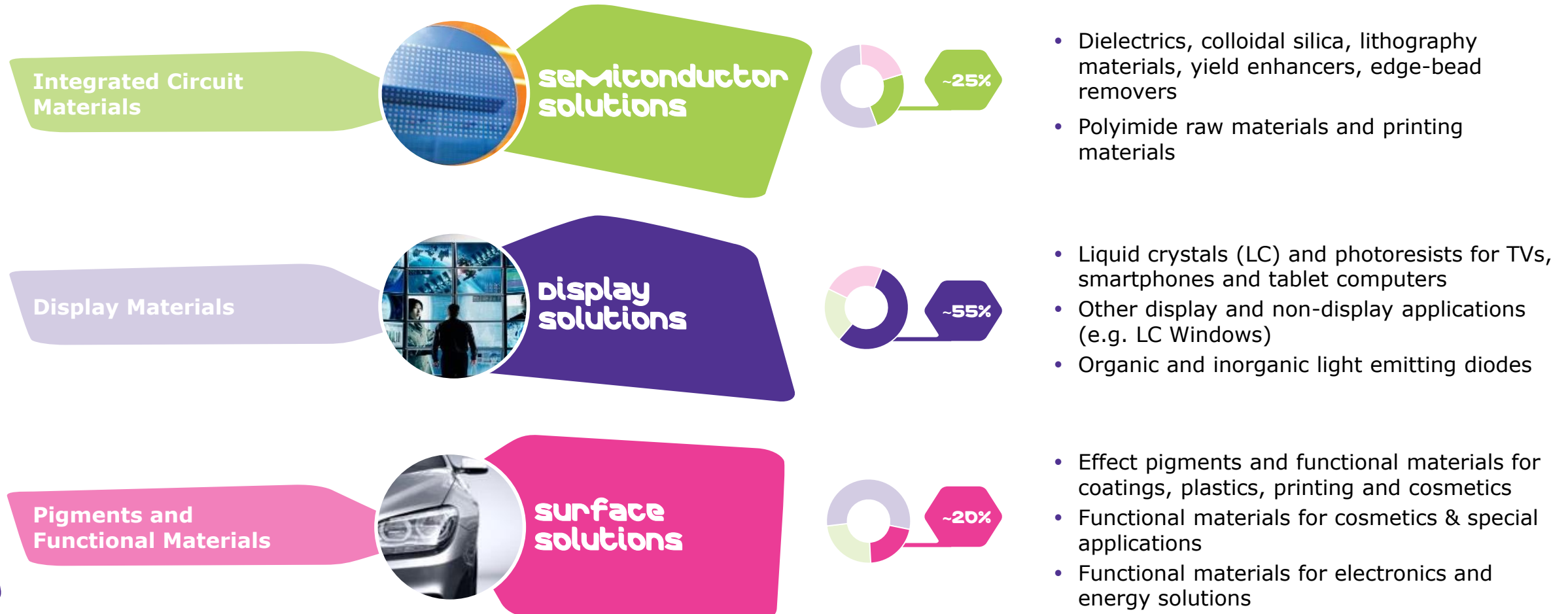
<sup>1</sup>Bubble size in competitive landscape illustrates share of semiconductor and display material sales of indicated competitors (C1 – C14)

<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

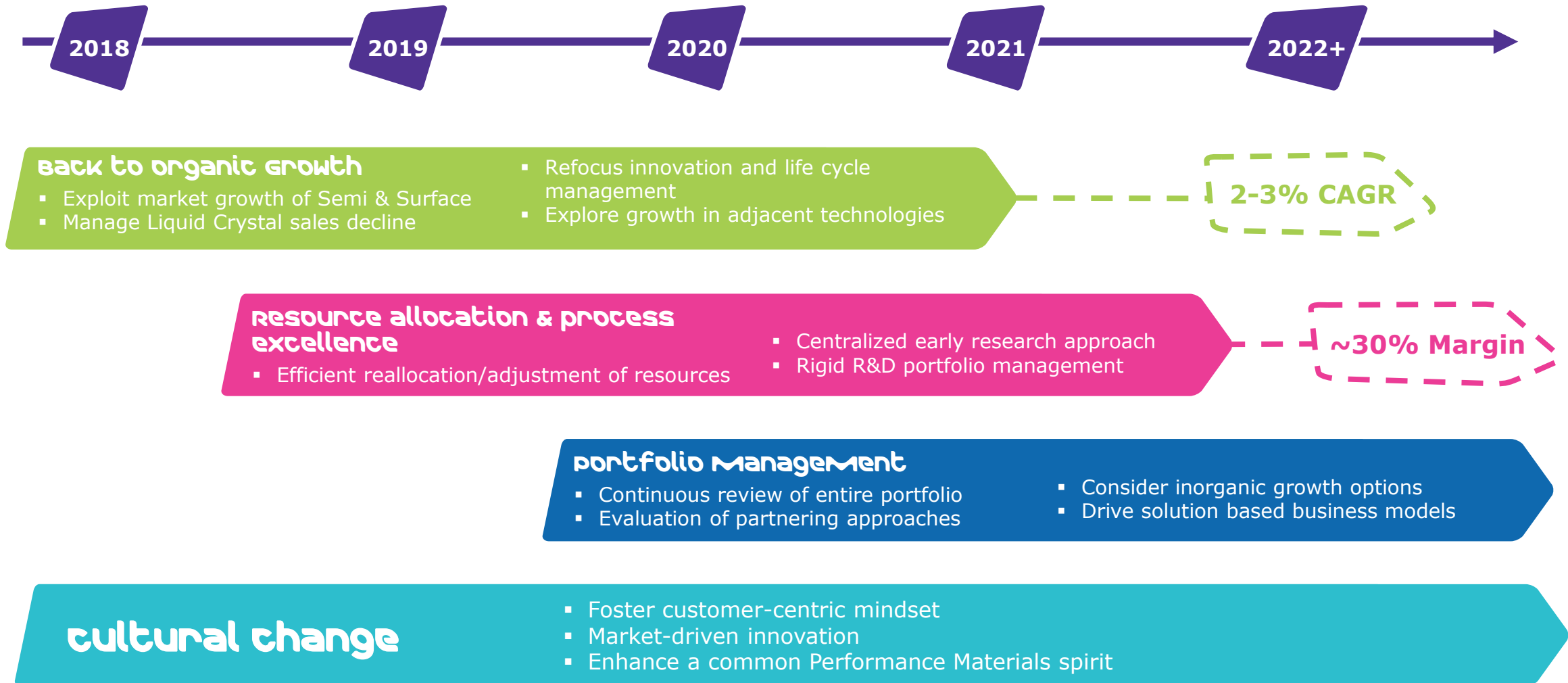
## Three high-tech pillars serving a diverse customer base

### Business allocation within Performance Materials

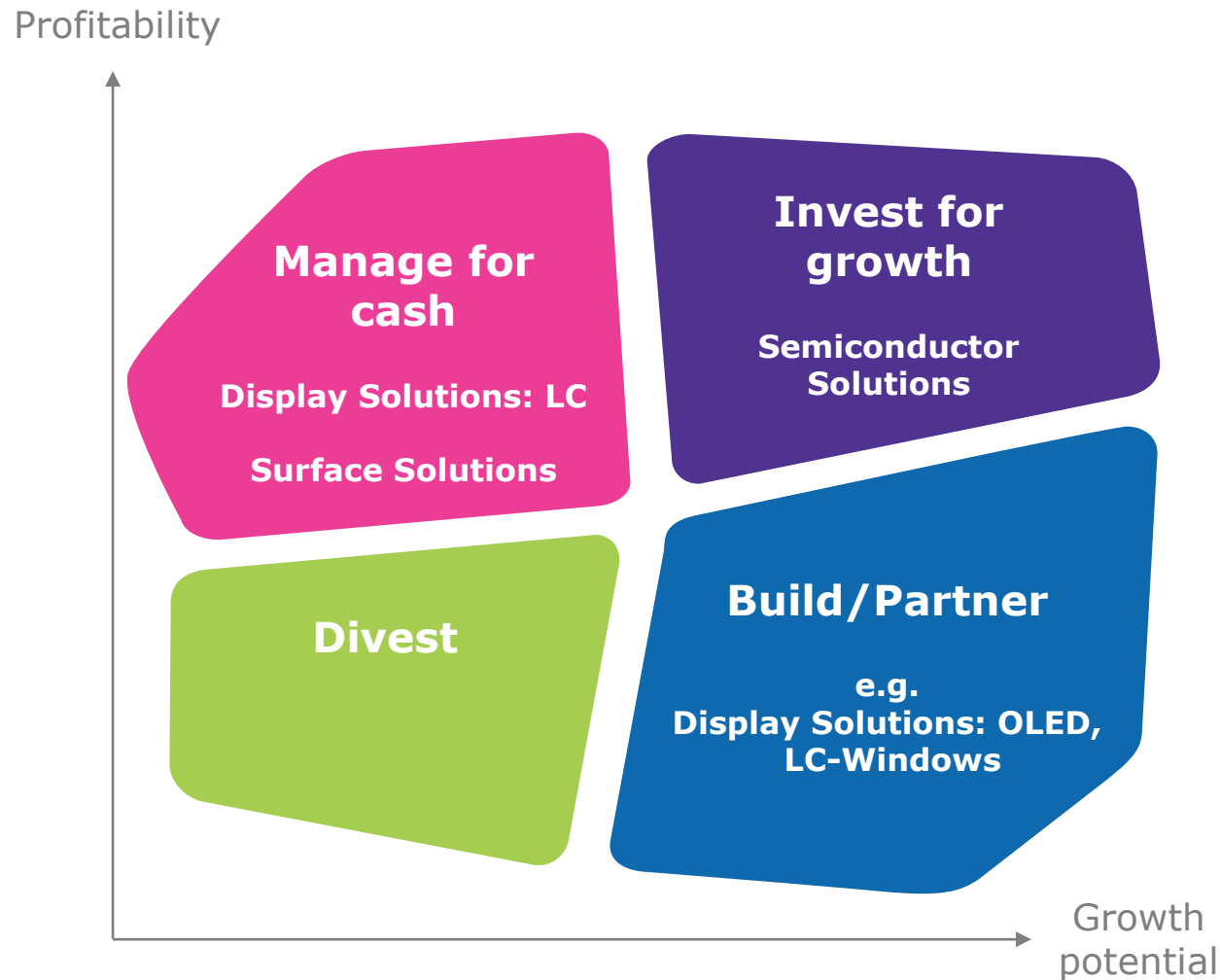


## "Bright Future"

### 5-year transformation program drives long-term performance



# Business portfolio management drives capital allocation and enables future value creation



## Invest for growth

- Strong and sustainable market growth
- Leading positions and attractive growth opportunities

## Manage for cash

- Mature and lucrative market segments
- Invest in extension, while managing for profit

## Build or Partner

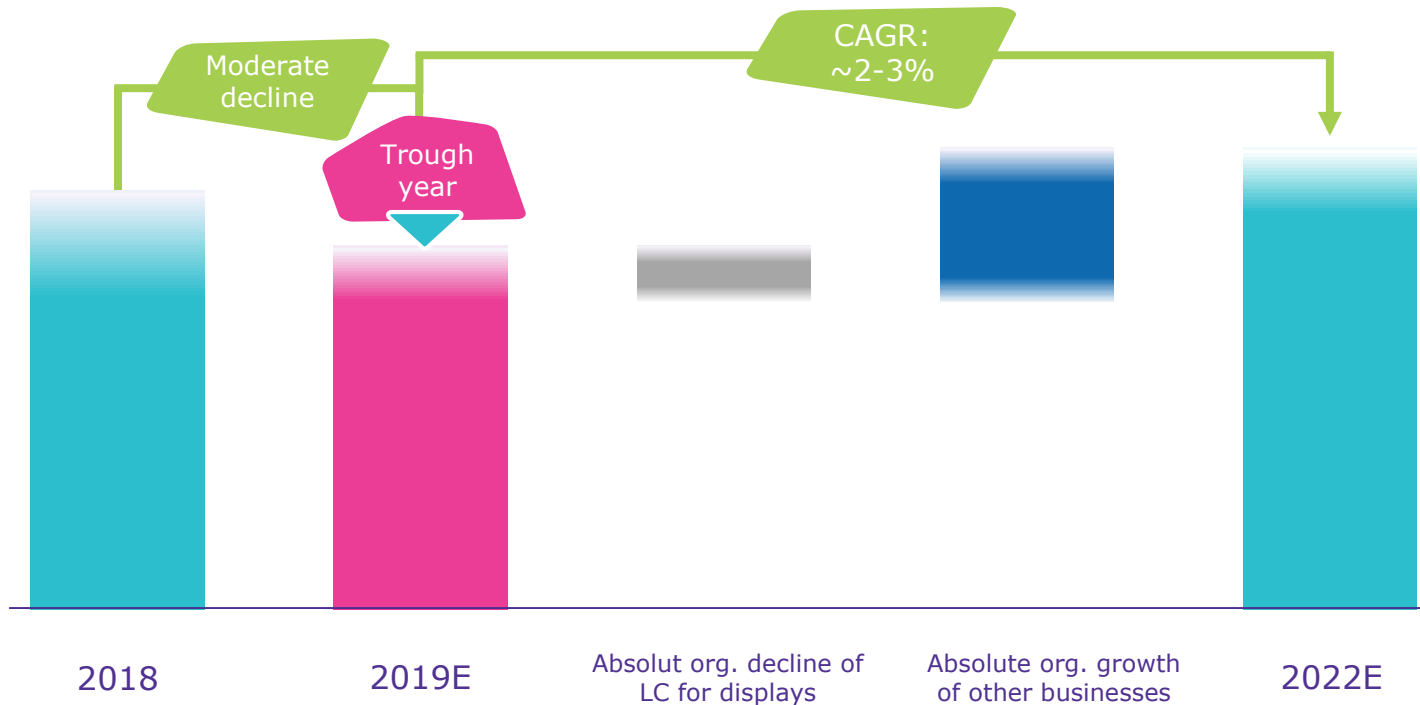
- Early industry cycles with strong potential
- Strictly prioritize and diversify risk

## Divest

- Regular review for better strategic owner

# Performance Materials will return to sales growth after 2019

Performance Materials sales development,  
in €m



2019-2022 sales growth trajectory



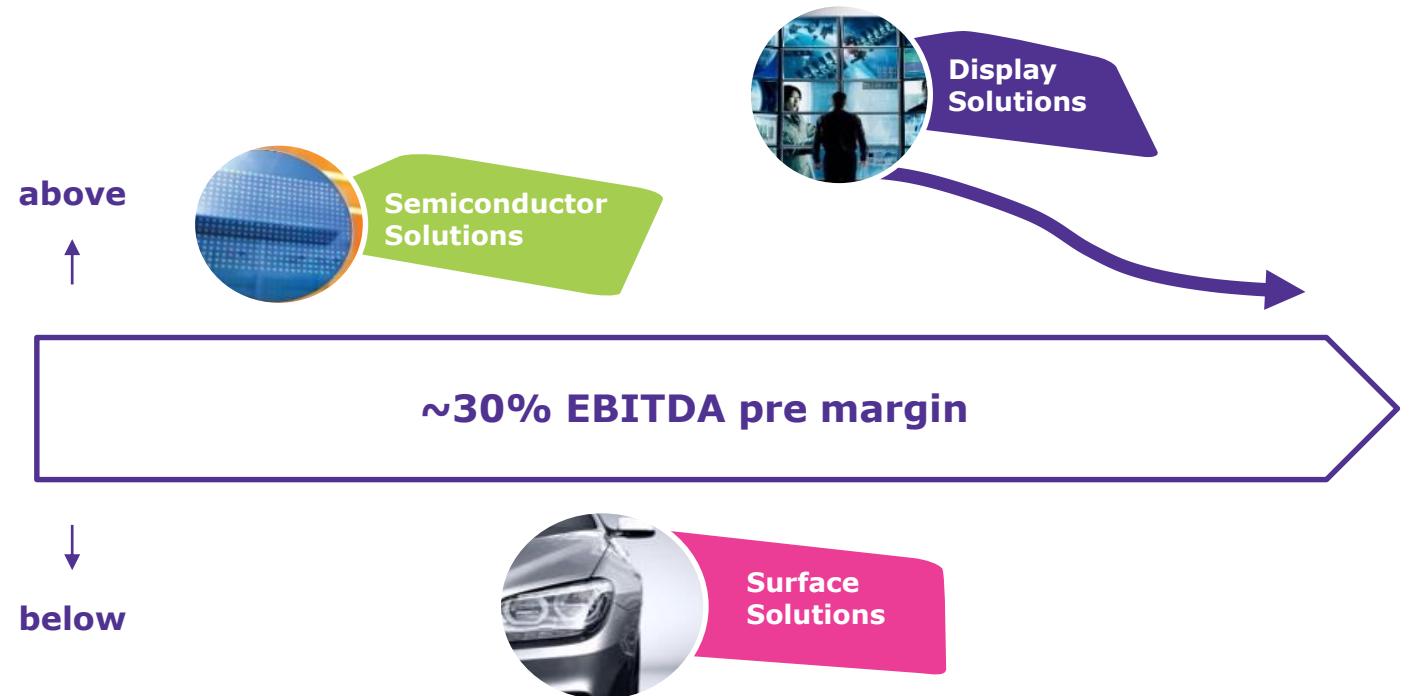
**After 2019 sales growth of Semiconductor & Surface Solutions, OLED and Photoresists will overcompensate the decline of Liquid Crystals for displays**

# 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







## 06 EXECUTIVE SUMMARY AND GUIDANCE

# Group

## Qualitative full-year 2019 guidance

### **Net sales:**

Moderate organic growth  
Slight FX headwinds of -1% to -2% YoY

### **EBITDA pre:**

Strong organic % YoY increase in the low teens\*  
Moderate FX headwinds of -3% to -4% YoY

# Group

## Key earnings drivers to remember for 2019



### EBITDA<sup>1</sup>-supporting factors

- Strong sales contribution from Mavenclad® ramp-up and Bavencio®; first sales contribution from Mavenclad® U.S. with potential FDA approval expected in Q2 2019
- Ongoing strength at Life Science with organic net sales growth slightly above market
- Successful partnering of M7824 with ~€100 m of deferred income from upfront payment recognized as other operating income
- Income from milestones and management of pipeline (part of operating business in Healthcare)
- Lower expected license payments for Erbitux®
- High level of cost consciousness and prioritization
- Adoption of IFRS 16 contributes ~€130 m<sup>2</sup> to organic EBITDA growth YoY



### EBITDA<sup>1</sup>-reducing factors

- Slight absolute increase in R&D costs budgeted for Healthcare but decrease as % of sales (actual development will be subject to clinical data outcome of priority projects and prioritization decisions)
- Healthcare underlying margins negatively impacted by product mix
- Performance Materials sales and earnings reaching trough due to expected decline in Liquid Crystals
- Negative FX impact from unfavorable currency development in Emerging markets; EUR/USD of 1.15-1.20 neutral versus 2018

<sup>1</sup>EBITDA pre; <sup>2</sup>Incl. ~€130m YoY contribution from adoption of IFRS 16 (Healthcare ~30%, Life Science ~40%, PM ~10%, CO ~20%)



# Group

## 2019 business sector guidance



### Healthcare

#### Net sales

- Moderate organic growth
- Base business at least stable organically
- Strong contributions from launches
- Includes expected Mavenclad US approval

#### EBITDA pre

- Strong % YoY increase in the low to mid twenties
- Driven by new launches, partnering and active pipeline management
- Strong adverse FX impact



### Life Science

#### Net sales

- Organic growth slightly above ~4% p.a. medium-term market growth
- All businesses contributing; Process Solutions remains main growth driver

#### EBITDA pre

- Strong, up to double-digit organic growth driven by sales growth and margin progression
- Moderate negative FX impact



### Performance Materials

#### Net sales

- Moderate organic decline
- Liquid Crystals temporarily benefiting from capacity ramp-up in China

#### EBITDA pre

- Organic % YoY decline in the high single digits to low teens
- Ongoing price decline in LC cannot be offset by higher volumes
- FX about stable YoY

# Additional financial guidance 2019

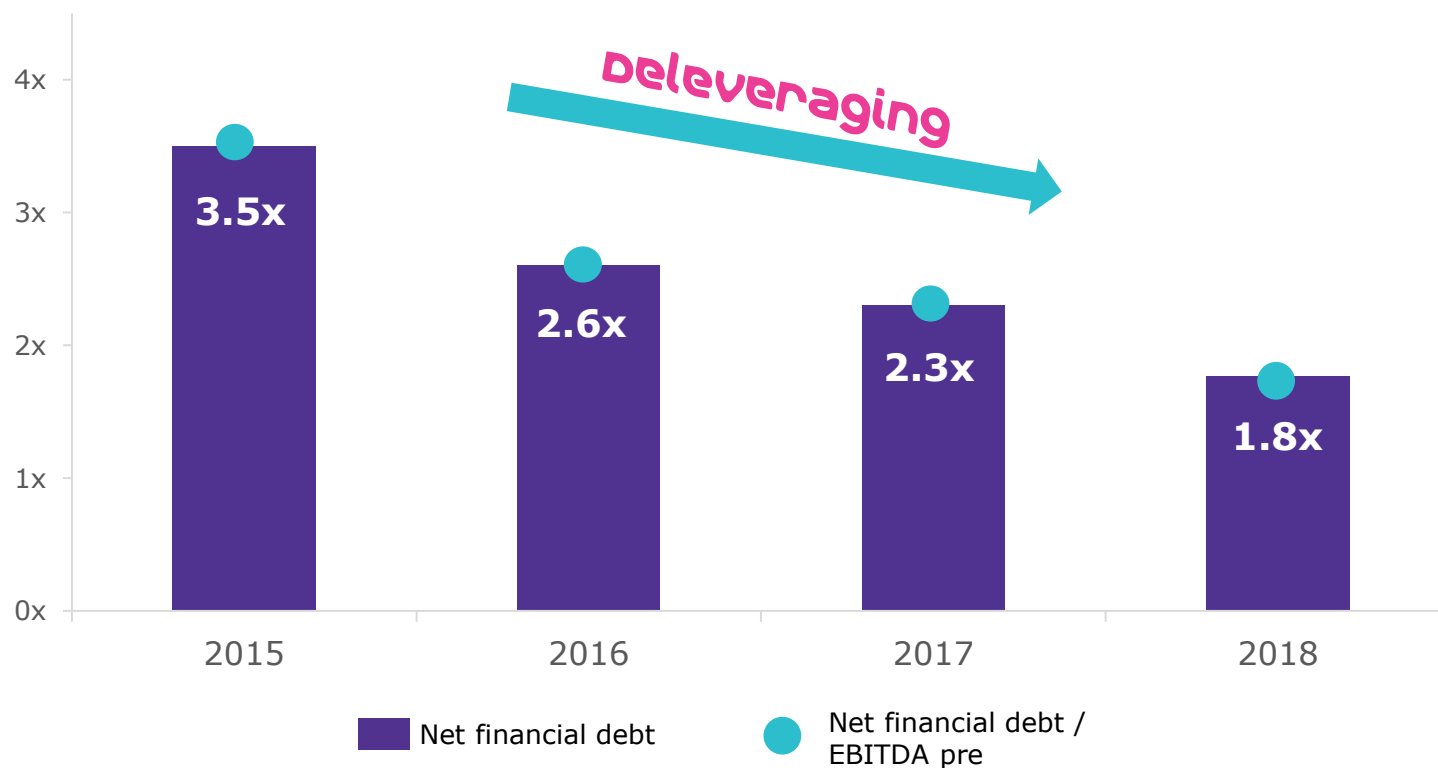
## Further financial details

Corporate & Other EBITDA pre	~ -€360 – -400 m
Interest result	~ -€220 – -240 m
Effective tax rate	~ 24% to 26%
Capex on PPE	~ €1.1 bn – 1.2bn
Hedging/USD assumption	<b>FY 2019 hedge ratio ~60% at EUR/USD ~1.20</b>
2019 Ø EUR/USD assumption	~ 1.15 – 1.20

# Strong focus on cash generation to ensure swift deleveraging

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

[Net financial debt/  
EBITDA pre]



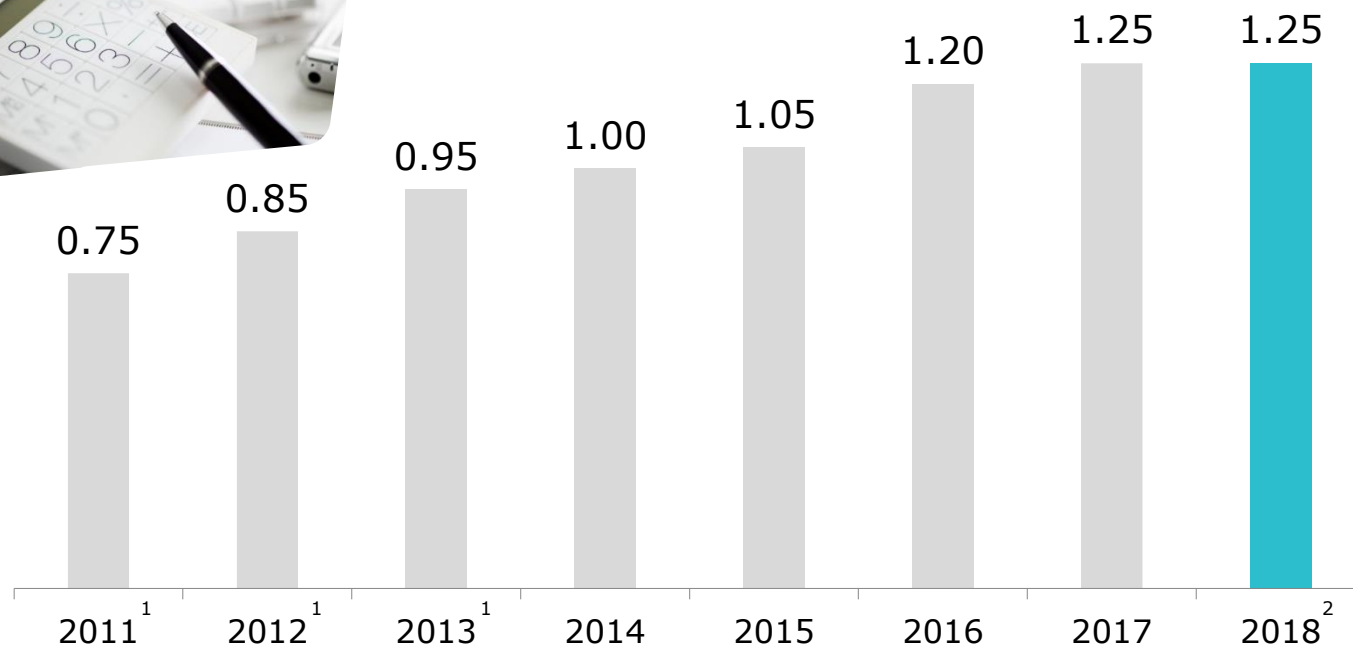
## Focus on deleveraging in 2018

- Commitment to swift deleveraging to ensure a strong investment grade credit rating and financial flexibility
- Consumer Health disposal contributed to achieve targeted net debt / EBITDA pre ratio of <2x

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

# Stable dividend amid lower EPS pre

## Dividend<sup>1</sup> development 2011-2018



## 2018 dividend

- Dividend of €1.25 per share proposed<sup>2</sup> for 2018
- Increase in payout ratio to 24.5% of EPS pre in 2018 vs. 20.3% in 2017<sup>3</sup>
- Dividend yield<sup>4</sup> of 1.4%

<sup>1</sup>Adjusted for share split, which has been effective since June 30, 2014; <sup>2</sup>Final decision is subject to Annual General Meeting approval;

<sup>3</sup>Calculated with 2017 EPS pre of € 6.16, while ex CH EPS pre € 5.92 posts 21.1% payout ratio; <sup>4</sup>Calculated with 2018 year-end share price of € 89.98 per share



# Healthcare Strategy

## The Healthcare Pipeline continues to deliver

February 12, 2019

### 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

**bintrafusp alfa (M7824)**  
**TGFbeta trap/anti-PD-L1**  
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>

**bintrafusp alfa (M7824)**  
**TGFbeta trap/anti-PD-L1**  
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 1L<sup>1,5</sup>

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

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

### Registration

**avelumab**  
**anti-PD-L1 mAb**  
Renal cell cancer 1L<sup>1,6</sup>

**cladribine tablets**  
**lymphocyte-targeting agent**  
Relapsing multiple sclerosis<sup>7</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 February 11 2019, the US Food and Drug Administration (FDA) has accepted for Priority Review the supplemental Biologics License Application (sBLA) for avelumab in combination with axitinib for patients with advanced renal cell carcinoma; <sup>7</sup> As announced on July 30 2018, the US 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.

# Oncology Strategy

## Strategy anchored on five foundational pillars

1	<b>Targeted Oncology</b>	<ol style="list-style-type: none"> <li>1. Erbitux: continued leadership in CRC and SCCHN</li> <li>2. Tepotinib: c-met driven cancers</li> </ol>	<ol style="list-style-type: none"> <li>1. Numerous Erbitux ISTs incl. combination with Avelumab</li> <li>2. Tepotinib in NSCLC, HCC</li> </ol>
2	<b>Avelumab</b>	<ol style="list-style-type: none"> <li>1. Monotherapy as a basis for combinations</li> <li>2. Establish immunogenic priming in combination or sequence with CT/RT<sup>1</sup></li> <li>3. Novel combinations</li> <li>4. Establish value of unique molecular characteristics (ADCC)</li> </ol>	<ol style="list-style-type: none"> <li>1. NSCLC 1L (high intensity)</li> <li>2. Maintenance in UC 1L, gastric 1L</li> <li>3. Avelumab + Inlyta (RCC 1L)</li> <li>4. Unique combinations leveraging ADCC</li> </ol>
3	<b>IO bi-functionals</b>	Engineer or access platforms where biology is best addressed by a bi-functional approach	<ul style="list-style-type: none"> <li>• TGF-beta trap/anti-PD-L1</li> <li>• Anti-LAG-3/anti-PD-L1</li> <li>• NHS-IL 12</li> </ul>
4	<b>DNA Damage Response inhibitors</b>	Establish leadership in DDR and leverage synergies across portfolio (immuno-oncology plus emerging platforms)	<ul style="list-style-type: none"> <li>• DNA-PK-i</li> <li>• ATR-i</li> <li>• ATM-i</li> </ul>
5	<b>Emerging Platforms</b>	Invest in complementary technologies within focus discovery areas	<ul style="list-style-type: none"> <li>• Antibody-Drug-Conjugates (ADC, e.g. partnership with Mersana/Sutro)</li> </ul>

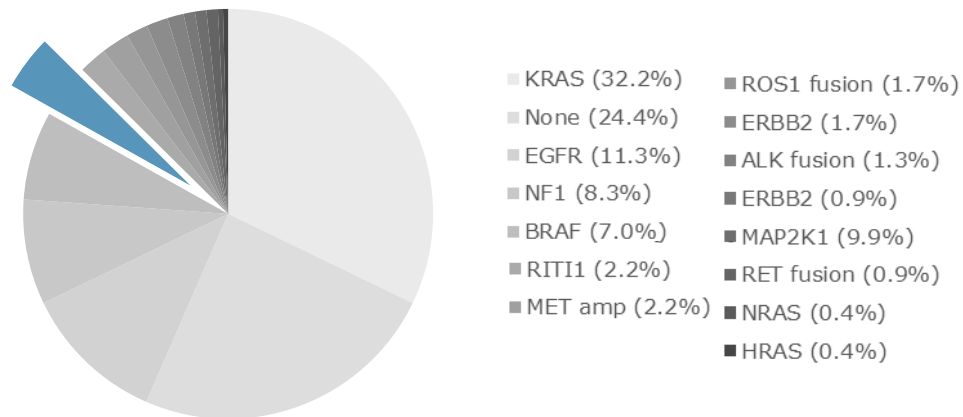
<sup>1</sup>Acronyms: CT: Chemotherapy | RT: Radiotherapy | ATM: ataxia-telangiectasia mutated | ATR: ataxia telangiectasia and Rad3 | DNA-PK: DNA-dependent protein kinase | RCC: Renal Cell Carcinoma | MCC: Merkel Cell Carcinoma | NSCLC: non-small cell lung cancer | DLBCL: Diffuse Large B-cell Lymphoma | UC: Urothelial Cancer

# Tepotinib: Highly selective c-met inhibitor

## There is currently no approved therapy targeting METex14 and/or c-met amplification

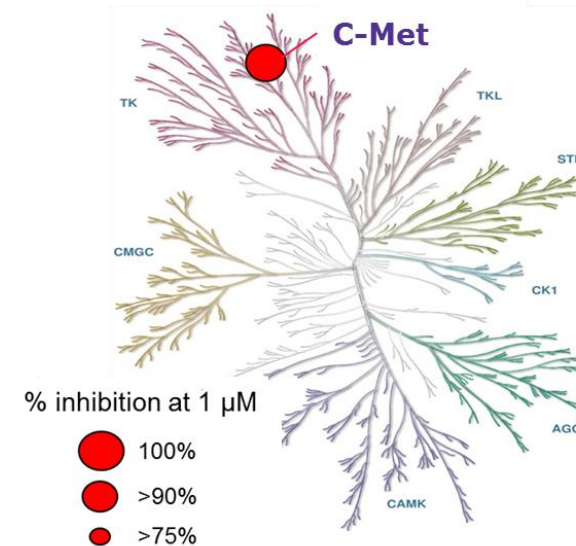
### Oncogenic drivers in lung adenocarcinoma<sup>1</sup>

- MET-mutations are clinically **unique molecular subtypes** of NSCLC
- MET exon 14 alteration confer oncogene addiction in **~3% of NSCLC**
- **No approved therapy** specifically targeting METex14 and/or c-Met amplification



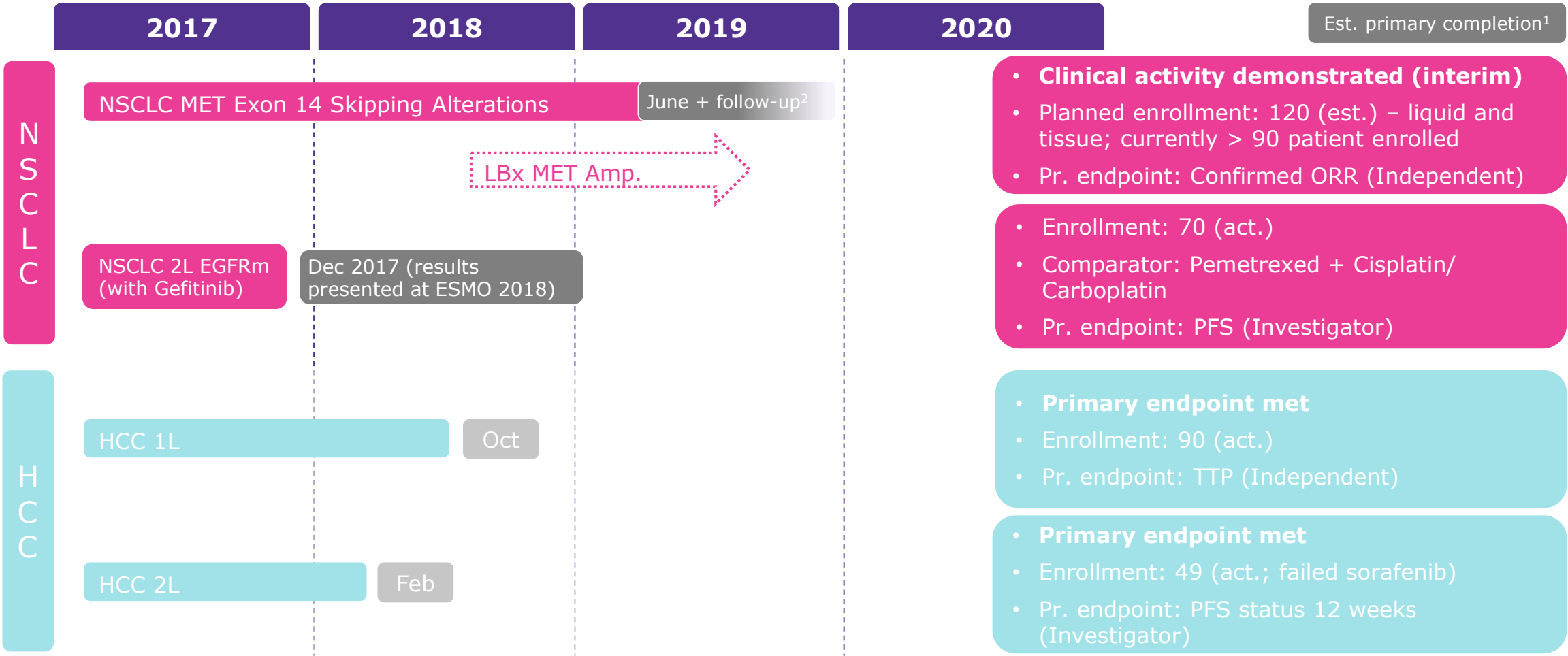
### Selectivity Profile<sup>2</sup>

- ATP competitive, **reversible small molecule** c-Met inhibitor<sup>3</sup>
- **Highly selective** according to preclinical benchmarking<sup>2</sup>
  - In panel of >240 kinases, only c-Met inhibited at 1  $\mu$ M
  - >90% inhibition of phospho-c-Met levels (tumor biopsy)



# Tepotinib: Program overview

## Development focuses on biomarker enriched patient populations



¹ Timelines are event-driven and may be subject to change; ² Confirmed ORR expected approx. in June 2019, subsequent durability of response/follow-up period pending outcome of discussions with health authorities

# Tepotinib: Interim Phase II results

## Encouraging signs of activity seen in patients with advanced NSCLC harboring METexon14-skipping mutations

VISION

Study Design<sup>1</sup>

- Patient population:**
  - Patients with advanced/metastatic NSCLC (all histologies) that are METexon 14-skipping mutation-positive
  - 46 patients treated
  - Based in EU, US and Japan
  - 1L, 2L and 3L treatment
- Treatment:** Tepotinib 500mg QD
- Primary endpoint:** ORR (IRC)
- Secondary endpoints:** ORR (investigator assessed), safety, duration of response, progression-free survival and overall survival

Interim results presented at the World Conference on Lung Cancer (WCLC) 2018<sup>1,2</sup>

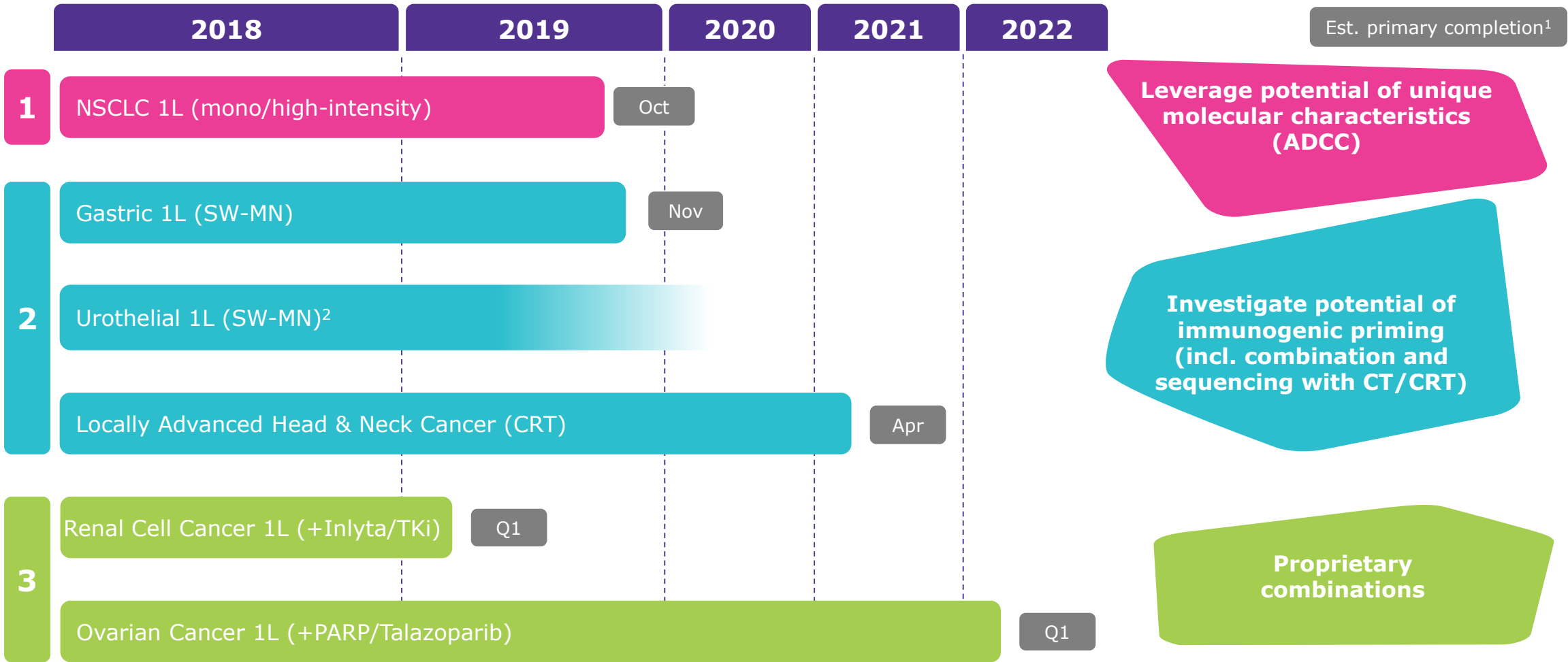
- Encouraging signs of activity**
- ORR to date** based on independent review (35.0%) and investigator assessment (57.5% incl. two CR)
- Median duration of response** based on investigator assessment is 14.3 months (95% CI: 3.7, nd)
- Safety:** well tolerated, most common side effects were peripheral edema and diarrhea

Tepotinib 500 mg <sup>2</sup>	Investigator	Independent
Complete response	2 (5.0)	0 (0)
Partial response	21 (52.5)	14 (35.0)
Stable disease	6 (15.0)	11 (27.5)
Progressive disease	5 (12.5)	8 (20.0)
Non-evaluable	6 (15.0)	7 (17.5)
ORR n (%)	23 (57.5)	14 (35.0)
DCR: n (%)	29 (72.5)	25 (62.5)

<sup>1</sup> Felip E et al., "Phase II Data for the MET Inhibitor Tepotinib in Patients with Advanced NSCLC and METexon14-Skipping Mutations", presented at WCLC 2018; <sup>2</sup> Combined analysis (n=40); efficacy analysis includes patients having at least 2 post-baseline assessments or who discontinued treatment for any reason (n=40)

# Avelumab: Program overview

## Ongoing studies – Six Phase III trials

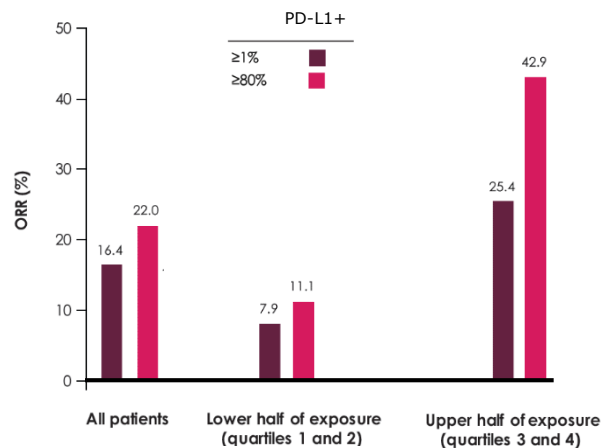
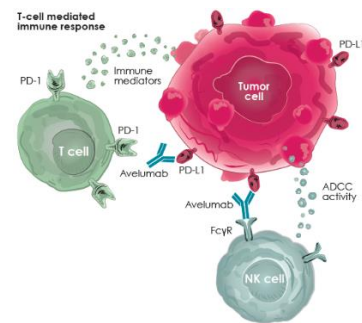


<sup>1</sup> Estimated primary completion date according to clinicaltrials.gov as of February 20, 2019, timelines are event-driven and may be subject to change; <sup>2</sup> Estimated primary completion being reprojected; Acronyms: NSCLC: Non Small Cell Lung Cancer, CT: Chemotherapy, CRT: Chemoradiotherapy, MN: Maintenance; SW: Switch

# Avelumab: NSCLC 1L

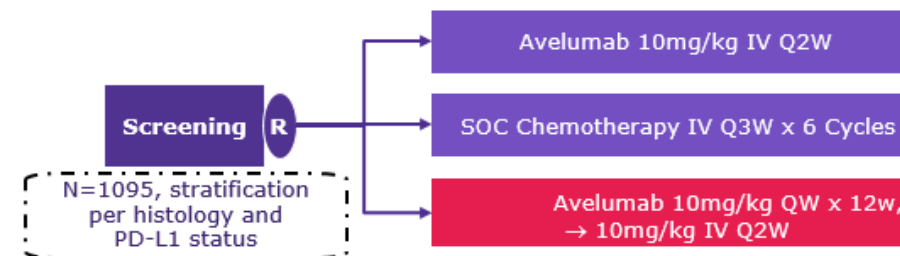
## Assessing potential efficacy upside in mono-therapy<sup>1</sup>

### NSCLC 2L+: exposure response



### NSCLC 1L: testing hypothesis of higher efficacy/intensity correlation

- **Hypothesis:** higher drug intensity may result in greater efficacy (potentially driven by ADCC)
- Potential association between **higher ORR** and **higher avelumab exposure**
- ORR highest in patients with both higher avelumab **exposure** and tumors with higher levels of **PD-L1 expression**
- **NSCLC 1L phase III trial amended** to leverage high-intensity hypothesis (est. primary completion Jul 2019)



- **Primary endpoints:** PFS & OS @ high PD-L1-expression
- **Secondary endpoints:** PFS & OS @ moderate and low PD-L1-expression (BOR, DOR, Safety, QoL)
- **Hierarchical ordered hypothesis**

# Avelumab: Renal Cell Carcinoma (RCC) 1L

## sBLA submission accepted and priority review granted by the FDA with feedback expected in June 2019

### Phase III JAVELIN Renal 101 Study<sup>1</sup>

- **Primary objective:** to demonstrate the superiority of avelumab + axitinib compared with sunitinib for either PFS or OS in patients with PD-L1+ tumors in RCC
- **Patient population:** 886 patients with advanced RCC across all risk groups, 63% PD-L1+
- **Study Design:**

#### Key eligibility criteria

- Treatment-naïve aRCC with a clear cell component
- $\geq 1$  measurable lesion as defined by RECIST v1.1
- Tumor tissue available for PD-L1 staining
- ECOG PS 0 or 1

#### Stratification

- ECOG PS (0 vs 1)
- Geographic region (USA vs Canada/Western Europe vs ROW)

R  
1:1

Avelumab 10 mg/kg IV Q2W  
+  
Axitinib 5 mg PO BID  
(6-week cycle)

Sunitinib 50 mg PO QD  
(4 weeks on, 2 weeks off)

### Regulatory Achievements & Next Steps

- **December 2017:** Breakthrough Therapy Designation granted by the FDA
- **September 2018:** Announcement of positive topline results as part of a planned interim analysis at ESMO 2018, followed by decision to pursue a regulatory submission in the US based on PFS data
- **February 2019:**
  - FDA accepts sBLA and grants Priority Review
  - Filing submitted to Japanese health authorities

**By June 2019:** Expected FDA decision  
Study continues as planned for OS

<sup>1</sup> Choueiri et al., „Subgroup analysis from JAVELIN Renal 101: outcomes for avelumab + axitinib vs sunitinib in advanced renal cell carcinoma“, presented at ASCO GU 2019

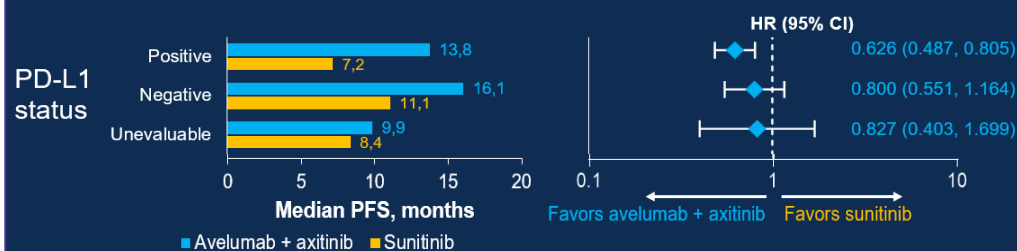


# Avelumab: Renal Cell Carcinoma 1L

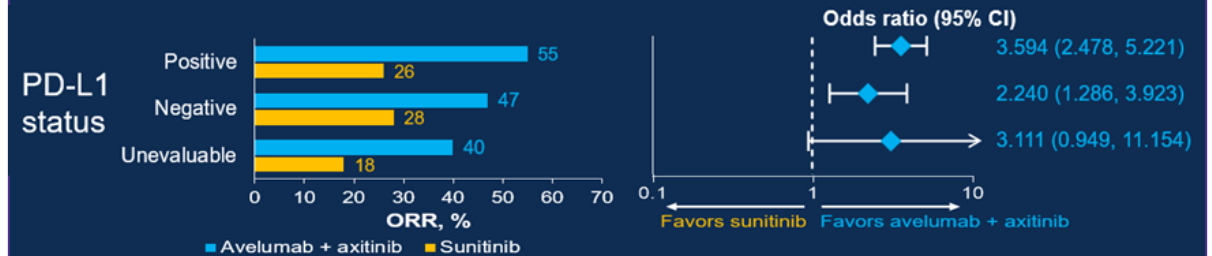
**Subgroup analysis presented at ASCO GU<sup>1</sup> 2019 shows PFS and ORR benefit regardless of PD-L1 status and in all prognostic risk groups**

## Progression Free Survival (mPFS)

	PFS (Risk groups per IMDC) <sup>2,4</sup>		
	Favorable	Intermediate	Poor
Competitor A	2.18 (1.29-3.68)	0.82 (0.64-1.05)	
<b>Avelumab – Axitinib (JAVELIN)</b>	<b>0.54 (0.32-0.91)</b>	<b>0.74 (0.57-0.95)</b>	<b>0.57 (0.38-0.88)</b>
Competitor B	0.81 (0.53-1.24)	0.70 (0.54-0.91)	0.58 (0.35-0.94)



## Objective Rate of Response (ORR, all-comers)



## Prognostic risk groups (IMDC/% of patients)<sup>3,4</sup>

### Favorable/intermediate/poor:

- **JAVELIN: 21%/61%/16%**
- Competitor B: **32%/55%/13%**

## Safety & Discontinuation (all-comers)<sup>3,4</sup>

### Safety (% patients, 3-5 TRAEs)

- **Avelumab-Axitinib: 57%**
- Competitor B: 63%

### Discontinuation (% patients):

- **Avelumab-Axitinib: 4%**
- Competitor B: 8.2%

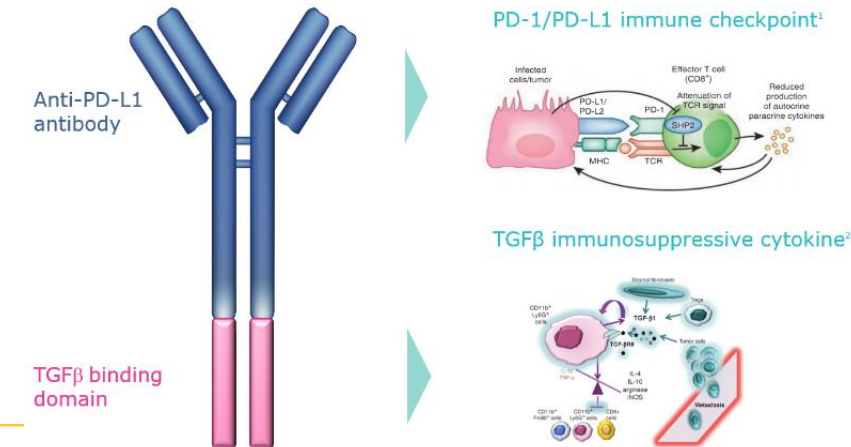
1: Choueiri et al., „Subgroup analysis from JAVELIN Renal 101: outcomes for avelumab + axitinib vs sunitinib in advanced renal cell carcinoma“, presented at ASCO GU 2019; 2: table adapted from slides of discussant Dr. Lori Wood, presented at ASCO GU2019; 3: Motzer et al., „Avelumab plus Axitinib versus Sunitinib for Advanced Renal-Cell Carcinoma“, New England Journal of Medicine, February 16, 2019; Brian et al., „Pembrolizumab plus Axitinib versus Sunitinib for Advanced Renal-Cell Carcinoma“, New England Journal of Medicine, February 16, 2019; 4: note that this is not a head-to-head trial comparisons

# Bintrafusp alfa<sup>1</sup> (M7824)

## An innovative first-in-class bifunctional fusion protein leading the TGF- $\beta$ immuno-oncology field

### Mode of action

- Innovative **first-in-class bifunctional fusion protein** designed to simultaneously target two immune suppressive pathways (blocking PD-L1 and reducing TGF- $\beta$  signaling)
- Demonstrated **superior anti-tumor activity in pre-clinical study** compared to anti-PD-L1 alone, and anti-PD-L1 and TGF- $\beta$  given in combination as separate agents
- **Great excitement in IO community** about M7824 uniquely addressing TGF- $\beta$  biology widely accepted as key resistance factor for anti-PDx therapies



### Clinical development achievements

- Tested in **14 Phase Ib expansion cohorts** across >700 patients in more than 10 tumor types
- Shown clinical anti-tumor activity across multiple hard-to-treat cancers including **advanced NSCLC, biliary tract cancer, HPV-associated cancers, and gastric cancer**
- PhII study **M7824 monotherapy versus pembrolizumab 1L**, advanced NSCLC high PD-L1-tumor expressers started in October 2018

### Clinical development plans

- **Eight high priority immuno-oncology clinical development studies** ongoing or expected to commence in 2019, including **pivotal registrational studies in non-small cell lung and biliary tract cancers**
- Further plans to be communicated at a later stage

## Bintrafusp alfa (M7824)

# Updated data presented at ESMO 2018 defined the next steps for the clinical development program

### NSCLC 2L

- **Need:** NSCLC accounts for 80-85% of all cases of lung cancer<sup>1</sup>
- **Results: Encouraging efficacy comparing favorably** to established PDx-inhibitor monotherapy (IRC)<sup>2,3</sup>:
  - **ORR (all-comers):** 25.0%
  - **ORR (PD-L1-positive):** 37.0%
  - **ORR (PD-L1-high):** 85.7%
- **Progression free survival by IRC (PD-L1  $\geq$  1%):**
  - M7824: **mPFS = 9.5 months**, competitor: 4.0 months<sup>2,3</sup>
- **Overall Survival by IRC (PD-L1  $\geq$  1%):**
  - M7824: **mOS not reached**, competitor: 12.7 months<sup>2,3</sup>

#### Next steps

**Two additional NSCLC trials** initiated in Q1 2019 (see next slide for details)

### Biliary Tract Cancer (BTC)

- **Need:** Few available treatment options (no 2L standard of care)<sup>4</sup>
- **Results: Encouraging activity<sup>5</sup>** in 30 Asian patients with pretreated biliary tract cancer
- **ORR<sup>5</sup>:** 20% (IRC assessment). Median DoR was NR (range, 8.3–13.9 months) with confirmed responses ongoing in all patients
- **Overall Survival by IRC:**
  - **mOS:** 12.7 months (6.7 – NR), comparing favorably with historical data in pretreated patients receiving second- or later line treatment (<7 months mOS in 2L<sup>4</sup>)
- Responses observed **irrespective of PD-L1 expression levels<sup>5</sup>**

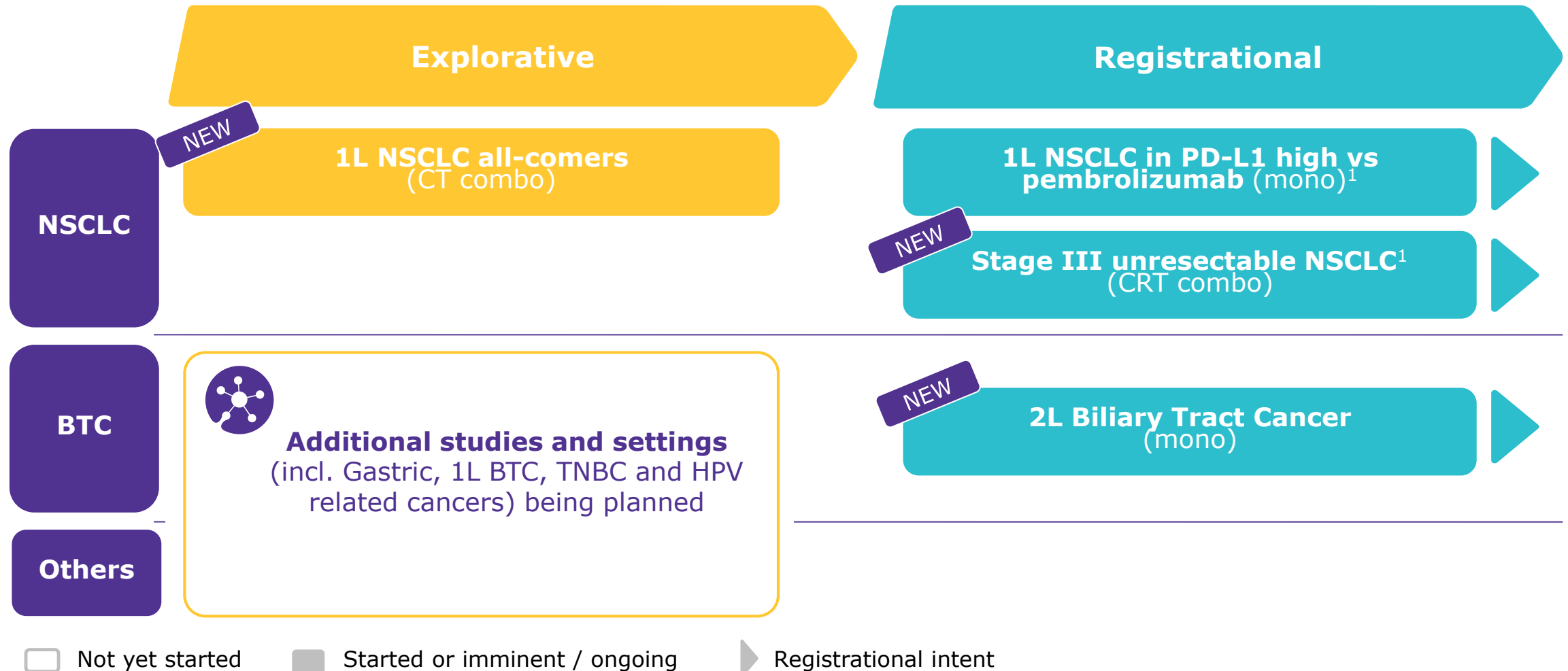
#### Next steps

**Additional 2L BTC study** initiated in Q1 2019 (see next slide for details)

<sup>1</sup> Jemal A et al., Cancer statistics, 2007, CA Cancer J Clin 2007;57:43-66; <sup>2</sup> Paz-Ares et al., Poster presented at the 43<sup>rd</sup> European Society for Medical Oncology Annual Meeting, Munich, October 19–23, 2018, data shown for 1200mg Q2W dose; <sup>3</sup> Herbst et al.; Pembrolizumab versus docetaxel for previously treated, PD-L1-positive, advanced non-small-cell lung cancer (KEYNOTE-010): a randomised controlled trial (www.thelancet.com Published online December 19, 2015 [http://dx.doi.org/10.1016/S0140-6736\(15\)01281-7](http://dx.doi.org/10.1016/S0140-6736(15)01281-7)); <sup>4</sup> Lamarca A, et al. Ann Oncol. 2014;25(12):2328–2338; <sup>5</sup> Yoo et al., Poster presented at the 43<sup>rd</sup> European Society for Medical Oncology Annual Meeting, Munich, October 19–23, 2018

# Bintrafusp alfa (M7824)

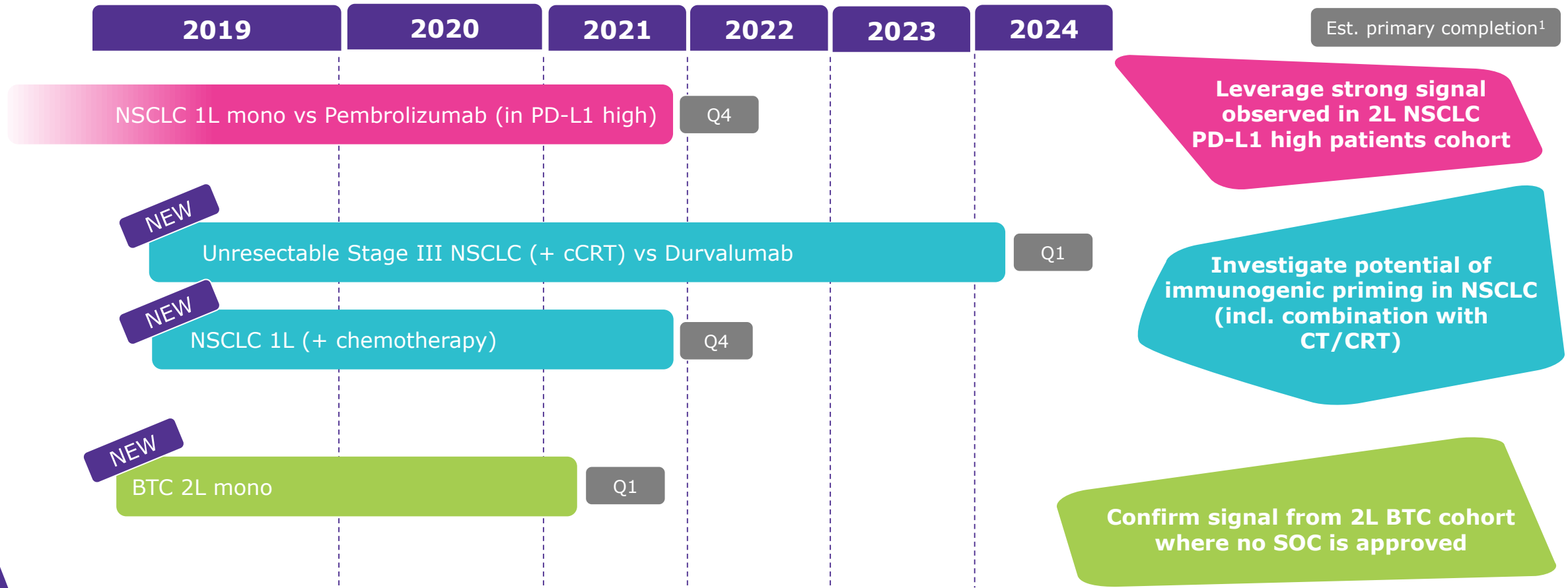
**Eight high priority immuno-oncology clinical development studies ongoing or expected to commence in 2019**



1: randomized controlled trials | Acronyms: CT = chemotherapy, CRT = chemoradiotherapy, NSCLC = non-small cell lung cancer, BTC = biliary tract cancer, TNBC = Triple-Negative Breast Cancer

# Bintrafusp alfa (M7824)

## Program overview: Three additional studies recently started



<sup>1</sup> Estimated primary completion date according to Clinicaltrials.gov as of February 14, 2019 and internal estimates for upcoming studies; timelines are event-driven and may be subject to change; Acronyms: NSCLC: Non Small Cell Lung Cancer; BTC: Biliary Tract Cancer; CT: Chemotherapy, cCRT: Chemoradiation therapy,

## Bintrafusp alfa (M7824)

### Attractive payment terms rewarding developmental success



#### upfront & milestone payment structure

**Total deal volume: €3.7 bn**

**Upfront payment:**  
€300 m

**Milestone payments: €3.4 bn**

Development  
(up to €500 m)

Approval

Commercial

**Development milestones:** Up to €500 m triggered by data from the M7824 lung cancer program

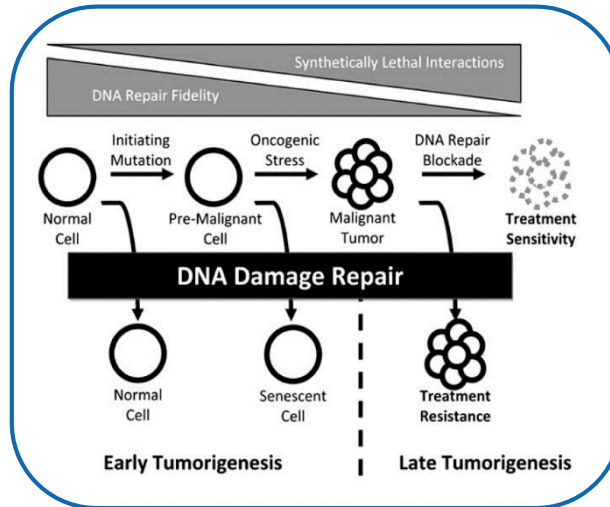


#### profit & cost sharing

- **Profits & Costs:** Shared equally on a global basis
- **Sales:** Merck KGaA, Darmstadt, Germany to recognize sales in the United States, GSK to recognize sales ex-US

# DNA damage response (DDR)

## Complete portfolio supporting leadership in a potentially disruptive class

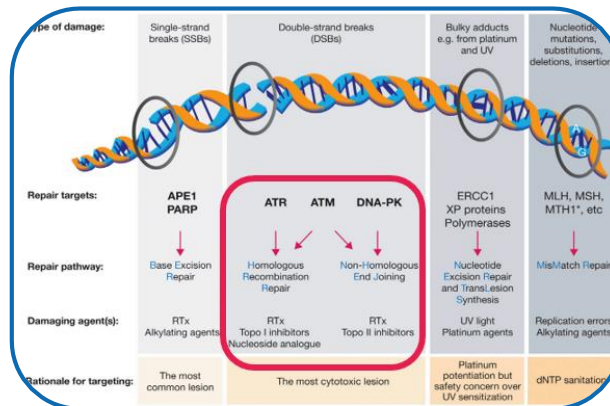


### Genomic instability: a hallmark of late stage cancers<sup>1</sup>

- DNA damage response (DDR) keeps genetic information intact
- In many cancers DDR pathways are defected, leading to greater dependency on remaining functional DDR pathways
- Preferentially inhibiting remaining DDR pathways can result in cancer cell death ("synthetic lethality")

### Amplifying cytotoxic effects of conventional and novel cancer treatments potentially bears combination potential

1. Inhibitor portfolio targets all three leading pathways of double stranded breaks – enabling unique synergies
2. ASCO 2017: leading DNA-PK-I (M3814) found safe and tolerable in a phase I study, with limited single-agent activity (20% of patients with stable disease for at least 18 weeks)<sup>2</sup>



<sup>1</sup> Sources: O'Connor, Molecular Cell, 2015 | Benjamin et al., Current Drug Targets, 2010, 11, 1336-1340; <sup>2</sup> "A multicenter phase I trial of the DNA-dependent protein kinase (DNA-PK) inhibitor M3814 in patients with solid tumors", Mark van Bussel, ASCO 2017; Acronyms: ATM: ataxia-telangiectasia mutated |ATR: ataxia telangiectasia and Rad3 | DNA-PK: DNA-dependent protein kinase |



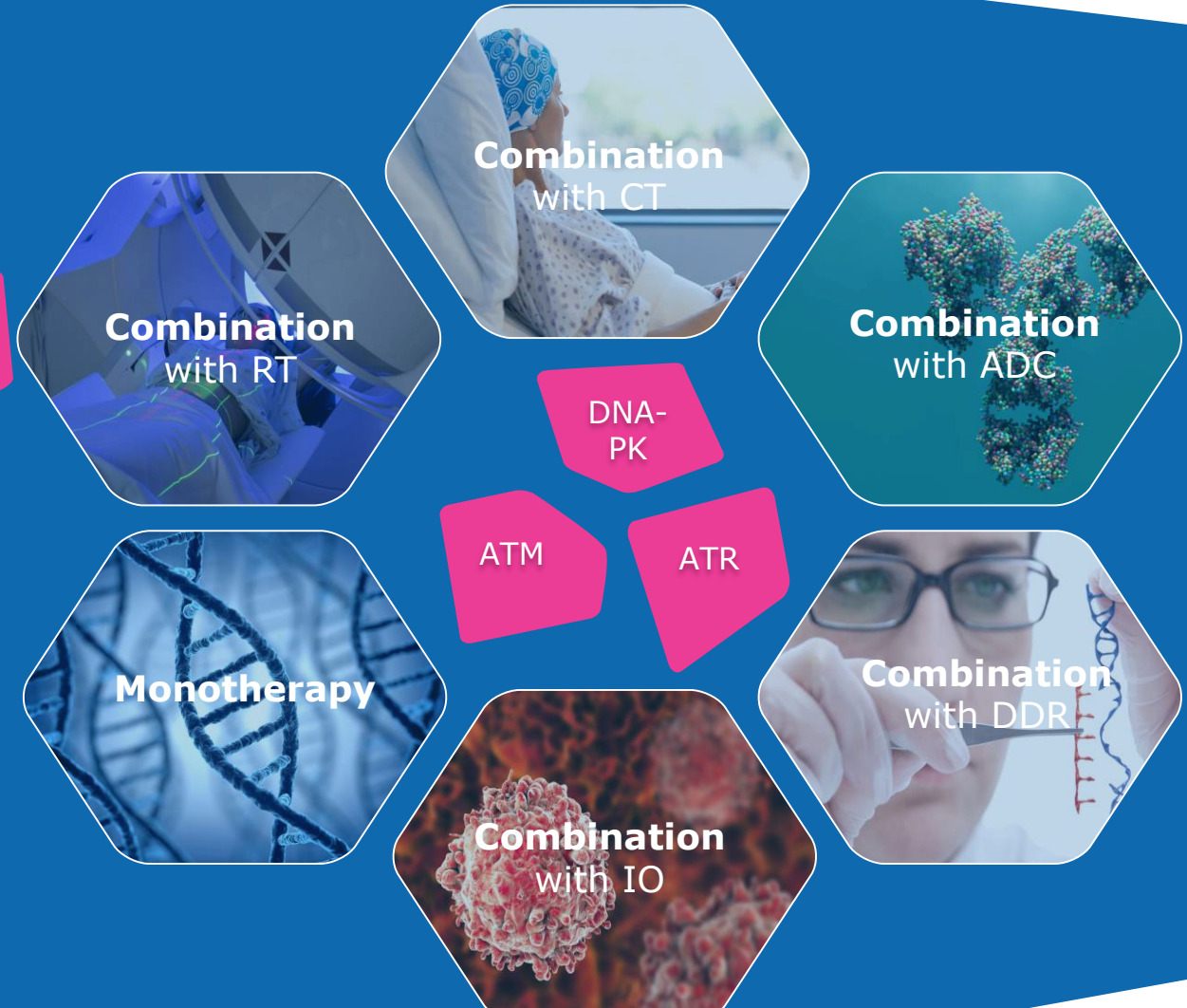
# DNA damage response (DDR)

## Broad combination potential across multiple mechanisms

At least **50%** of all cancer patients receive some type of **RADIATION** therapy (NCI 2016)

At least **70%** of all cancer patients receive some type of **CHEMOTHERAPY** (NCI 2016)

Significant share of patients to be treated with **CHECKPOINT INHIBITORS**

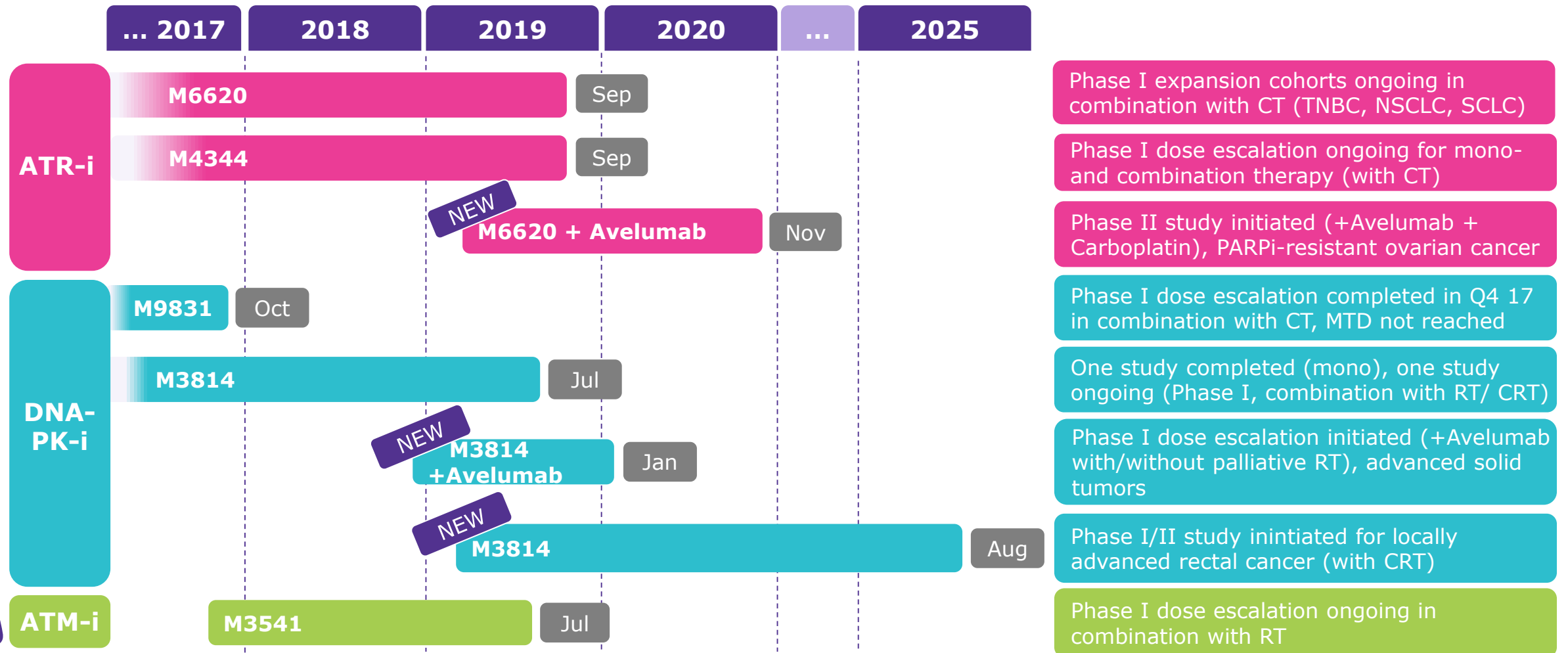




# DNA damage response (DDR)

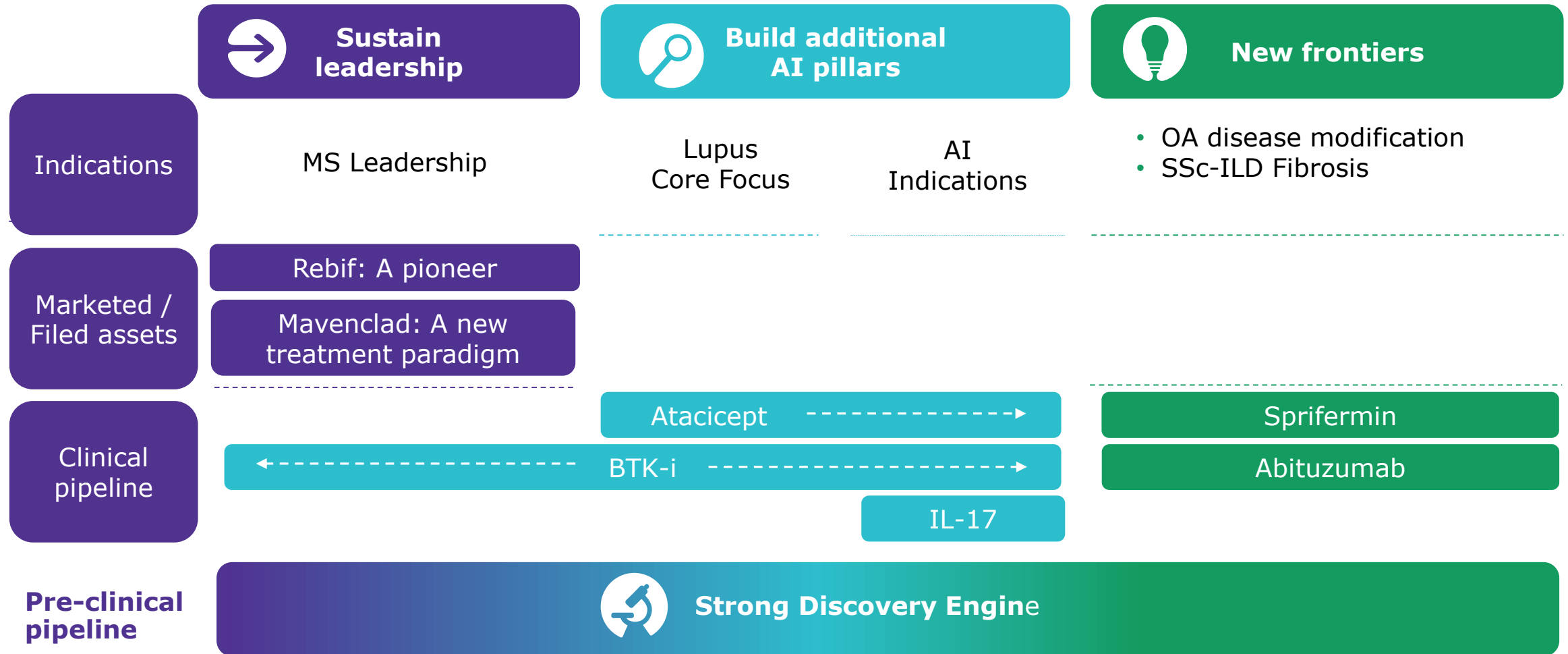
## Clinical program targets three major DDR pathways, in mono- and combination (incl. Avelumab)

Estimated primary completion<sup>1</sup>



<sup>1</sup> Estimated primary completion date according to Clinicaltrials.gov as of October 26, 2018; Acronyms: ATM: ataxia-telangiectasia mutated | ATR: ataxia telangiectasia and Rad3 | DNA-PK: DNA-dependent protein kinase | CT: Chemotherapy | RT: Radiotherapy | CRT: chemoradiotherapy | NSCLC: non-small cell lung cancer | SCLC: small cell lung cancer | TNBC: triple negative breast cancer | MTD: Maximum Tolerated Dose; Note: timelines are event-driven and may change

## Immunology

**Strategy is anchored on leadership in selected disease areas**

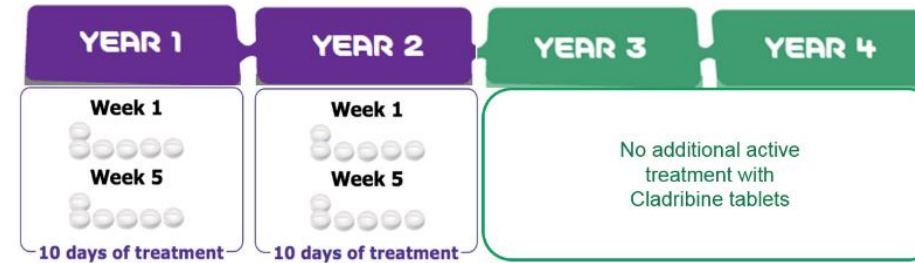
## Immunology

## Mavenclad could change the MS treatment paradigm

**Selective immune reconstitution therapy (SIRT)<sup>1</sup>**

...followed by reconstitution

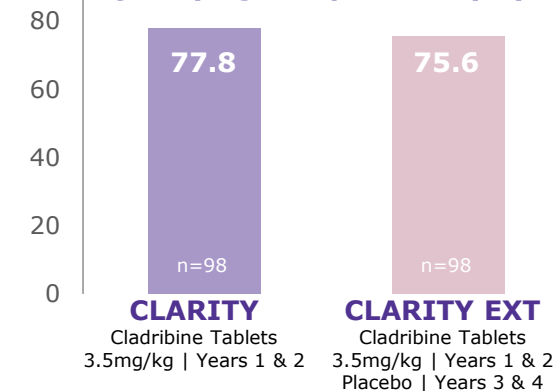
Selective reduction in B & T lymphocytes...



**Unique posology: max. 20 days of oral treatment<sup>3</sup>**

**4 years disease control with treatment over 2 years<sup>2</sup>**

**Proportion of Patients Qualifying Relapse Free (%)<sup>2</sup>**



		Key											
		Lymphocyte count			Treatment			MRI					
	Prior to treatment initiation	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
	TB/HSV/HCV screening <sup>4</sup>	5 days of treatment	5 days of treatment	5 days of treatment	5 days of treatment	5 days of treatment	5 days of treatment	5 days of treatment	5 days of treatment	5 days of treatment	5 days of treatment	5 days of treatment	5 days of treatment
Year 1													
Year 2													

**Low monitoring requirements<sup>4</sup>**

<sup>1</sup> Giovannoni G. Neurotherapeutics 2017; Nov 22 [Epub ahead of print] | Wiendl H et al. Neurology 2017;89:1098-100 | Wiendl H. Nat Rev Neurol 2017; Sept 8 [Epub ahead of print]

<sup>2</sup> Giovannoni G et al. N Engl J Med 2010;362:416-26 | Giovannoni G et al. Mult Scler Aug 1 [Epub ahead of print] <sup>3</sup> Maximum of 20 days of oral dosing over 2 years with no further treatment required in the next 2 years. For important safety information, refer to the abbreviated Prescribing Information | Oral, weight-based dosing. For an average patient weighing 67 kg. Recommended treatment over 2 years. One treatment course per year, followed by observation for another 2 years. Each treatment course consists of two treatment weeks, one at the beginning of the first month and one at the beginning of the second month of the respective year | MAVENCLAD® EU SmPC, September 2017 | Giovannoni G et al. N Engl J Med 2010;362:416-26 <sup>4</sup> MAVENCLAD® EU SmPC September 2017 | Screening must be performed prior to initiation of therapy in Year 1 and Year 2. Vaccination of antibody-negative patients is recommended prior to initiation of Cladribine Tablets. AE, adverse event; HBV, hepatitis B virus; HCV, hepatitis C virus; MRI, magnetic resonance imaging; NEDA, no evidence of disease activity; TB, tuberculosis

## Immunology

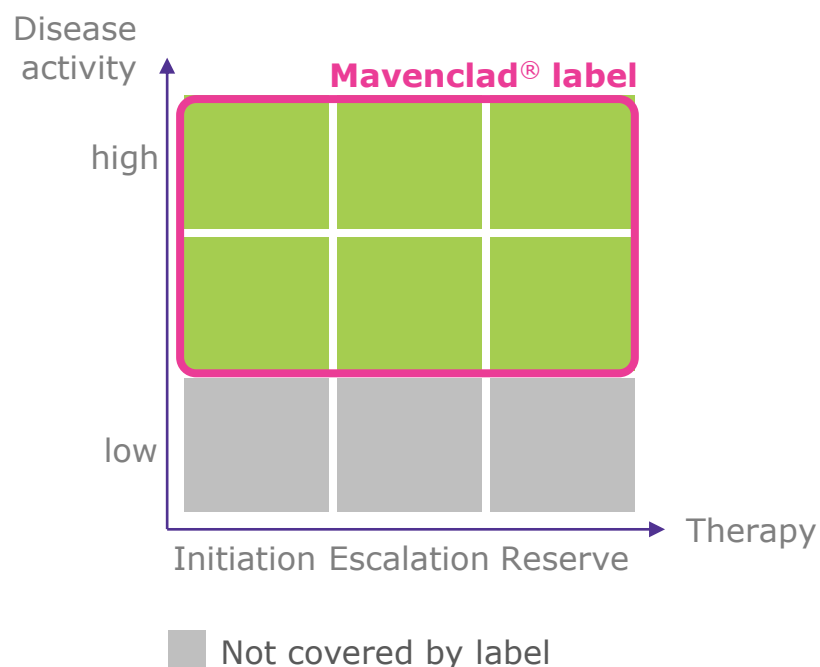
# Mavenclad®'s attractive label<sup>1</sup> in Europe supports integrated franchise strategy

**Mavenclad® label covers 60-70% of patients with RRMS<sup>2</sup> within the MS<sup>1</sup> patient population in Europe**

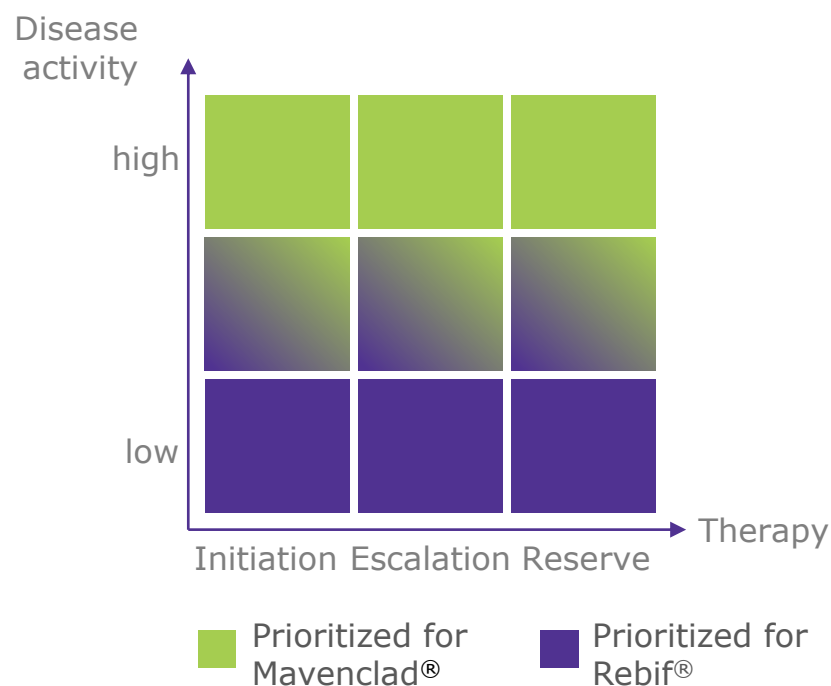
**Merck's KGaA, Darmstadt, Germany overall NDD franchise will cover a broad MS patient pool**

**Integrated franchise strategy**

## MS patient population<sup>3</sup>



## RRMS patients, EU-5<sup>4</sup>



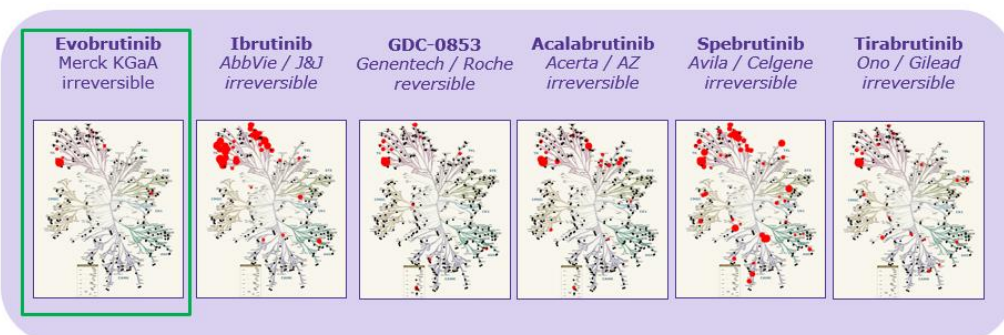
- ✓ At patient level: Rebif® and Mavenclad® are **highly complementary**
- ✓ At physician level: High overlap
- ✓ Franchise infrastructure investment benefits both brands

<sup>1</sup>Mavenclad® label covers: RRMS+rSPMS+rPPMS; <sup>2</sup>Abbreviations: RRMS = relapsing-remitting multiple sclerosis, MS = multiple sclerosis, rSPMS = relapsing secondary progressive MS, rPPMS = relapsing primary progressive multiple sclerosis; <sup>3</sup>Source: Merck KGaA, Darmstadt, Germany; <sup>4</sup>Source: Merck KGaA, Darmstadt, Germany, Ipsos; As of September 2018, Mavenclad was reimbursed in 22 countries globally

# Evobrutinib

## Highly selective BTK-i to be explored as chronic therapy

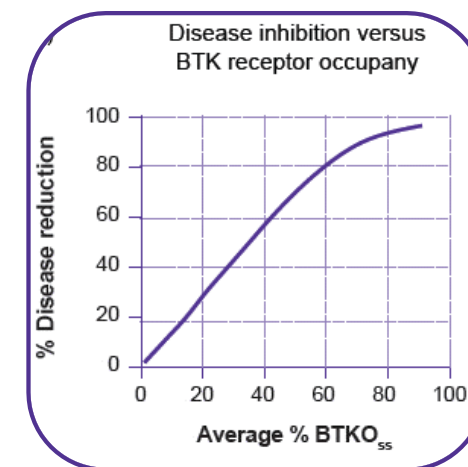
### Safety: Promising kinase selectivity minimizing off-target effects<sup>1</sup>



- Greater selectivity vs. in-class competitors in kinase screen (>270 kinases)
- Besides BTK, two more kinases inhibited (vs. 25 off-target kinases by others)
- Kinase selectivity may result in lower AE rate vs. existing treatments

### Efficacy: Oral, highly efficacious in pre-clinical models<sup>1</sup>

- Evobrutinib (irreversible antagonist) inhibiting signal transduction until protein is naturally degraded (no B-cell depletion)
- Occupancy/efficacy correlation: average BTK occupancy of >80% correlated with near complete inhibition of disease activity<sup>1</sup>
- Clinical benefit of addressing B cell biology demonstrated by anti-CD20 targeting agents
- Insights from phase IIa trial (RA) leveraged in broad clinical development program (three phase IIb trials in MS, SLE, and RA)



<sup>1</sup> "Pharmacodynamic Modelling of BTK Occupancy versus Efficacy in RA and SLE Models Using the Novel Specific BTK Inhibitor M2951" Abstract #4342; EULAR 2016

## Evobrutinib

**First BTKi demonstrating clinical proof-of-concept in relapsing multiple sclerosis (RMS)<sup>1</sup>****Study Design**

- **Design:** Randomized, double-blind, placebo-controlled study in patients with RMS
- **Patient population:** 267 patients
- **5 arms:** placebo vs. 3 drugs-arms (low, mid, high dose<sup>2</sup>) incl. open-label reference arm (dimethyl fumarate, 240 mg BID)
- Gadolinium enhancing T1 (T1 Gd+) lesions measured at weeks 12, 16, 20 and 24 in comparison to patients receiving placebo

**Study Outcome presented at ECTRIMS 2018:  
Significant reduction of T1 Gd+ lesions vs placebo****Primary endpoint (T1 Gd+ lesions, wks 12-24, endpoint met):**

- T1 Gd+ lesion rate ratio vs placebo:
  - Evobrutinib 25 mg QD: 1.45
  - Evobrutinib 75 mg QD: 0.30
  - Evobrutinib 75 mg BID: 0.44

**Key secondary endpoint (ARR, wk 24, clinically relevant decrease):**

- Annualized Relapse Rate (ARR):
  - Placebo: 0.37
  - Dimethyl fumarate: 0.20<sup>3</sup>
  - Evobrutinib 25 mg QD: 0.57
  - Evobrutinib 75mg QD: 0.13
  - Evobrutinib 75mg BID: 0.08

**Safety:**

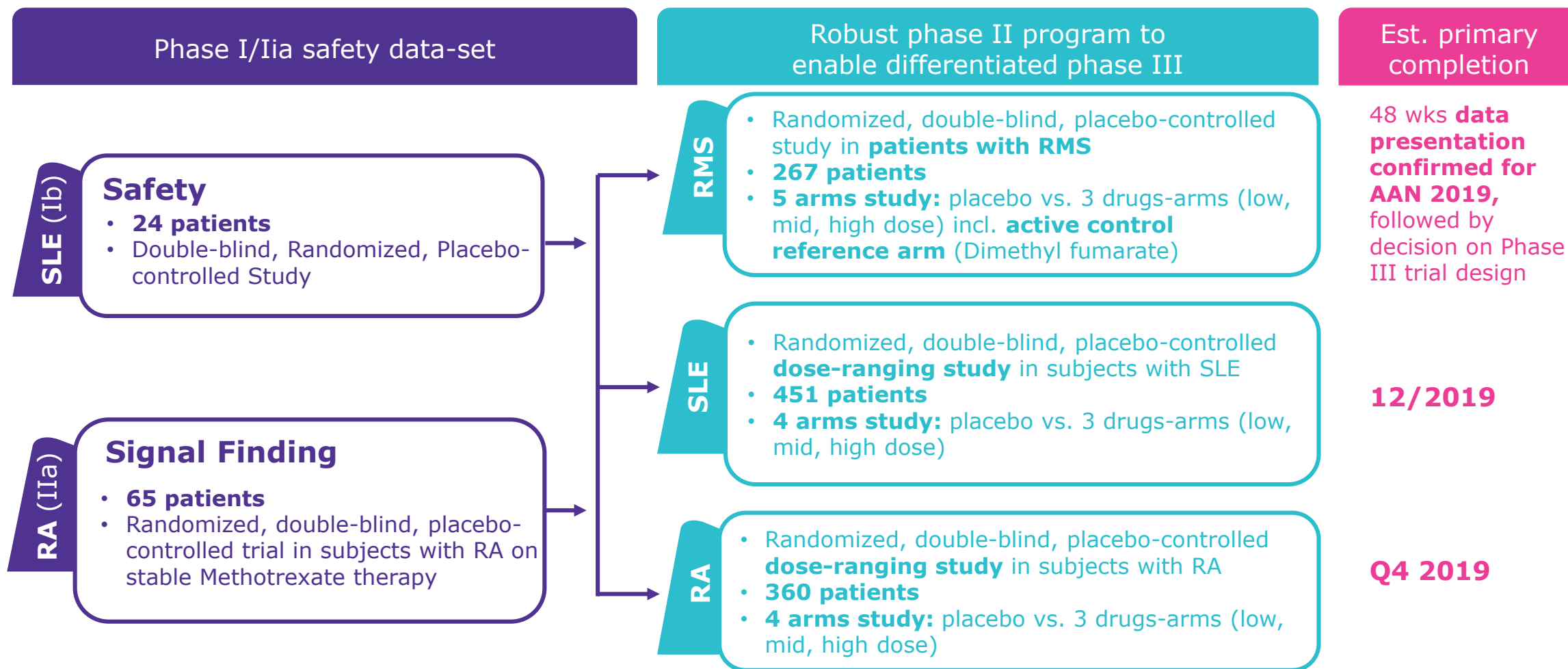
- Well tolerated, no treatment associated infections, infestations or lymphopenia observed
- Elevated ALT, AST and lipase levels observed were reversible and patients were asymptomatic

**Next  
steps**

**48 wks data**, informing  
**Ph III trial design**, to be  
presented at AAN 2019

## Evobrutinib

## Comprehensive development plan across immune-mediated diseases



All timelines are event-driven and may be subject to change.

## We are the only company to span the entire value chain of our customers

		Millipore Sigma	GE Healthcare Life Sciences	PALL	sartorius	ThermoFisher Scientific	other
Cell Culture Media		●	●	●	●	●	
Single-Use		●	●	●	●	●	
Hardware		●	●	●	●	●	
Chromatography		●	●	●	●	●	●
Buffers and Chemicals		●	●	●	●	●	●
Membranes and Filters	Clarification	●	●	●	●	●	●
	Aseptic	●	●	●	●	●	●
	Virus	●	●	●	●	●	●
	TFF	●	●	●	●	●	●

● = Top 3 Position by Market share   ● = Not Top 3 Player   ● = No Offering

64



# Process Solutions

## Next-generation bioprocessing on the cards

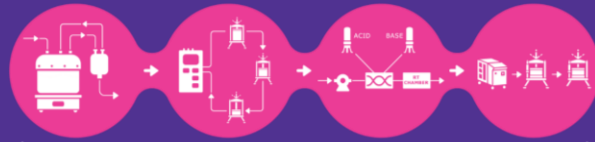
**Make**

**purify**

Today's  
process & portfolio



**MAb process intensification 2017 - 2020+**



**continuous processing >2025**



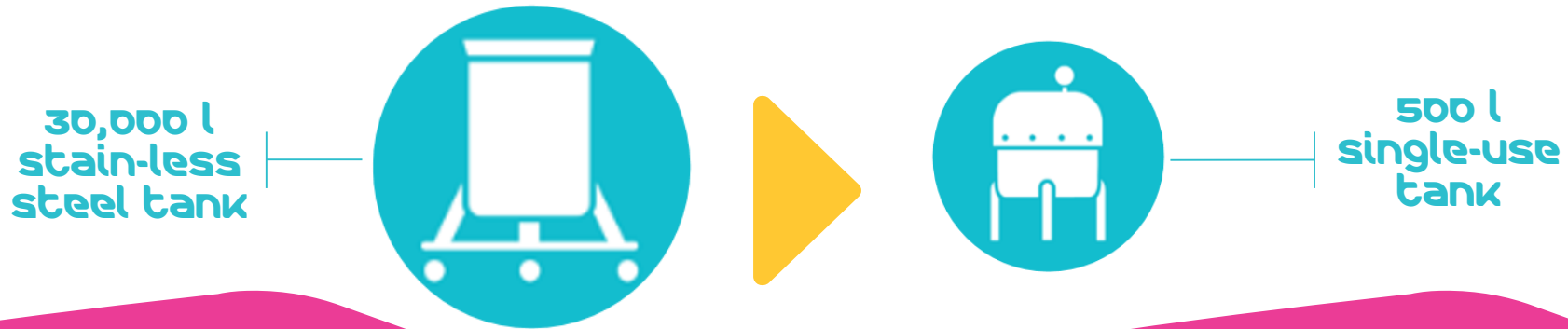
**Continuous bioprocessing will ...**

- be an evolution in mAb bioprocessing
- take time to establish
- leverage the present
- lead to hybrid solutions

Tomorrow's  
process

## Process Solutions

### Our single-use technologies drive flexibility in modern bioprocessing



#### Traditional Multi-use facility

CAPEX* required	~\$500 m to \$1 bn
Time to construct	5 to 10 years
Change over time	4 weeks
Footprint	~>70,000 m <sup>2</sup>

#### Innovative single-use facility

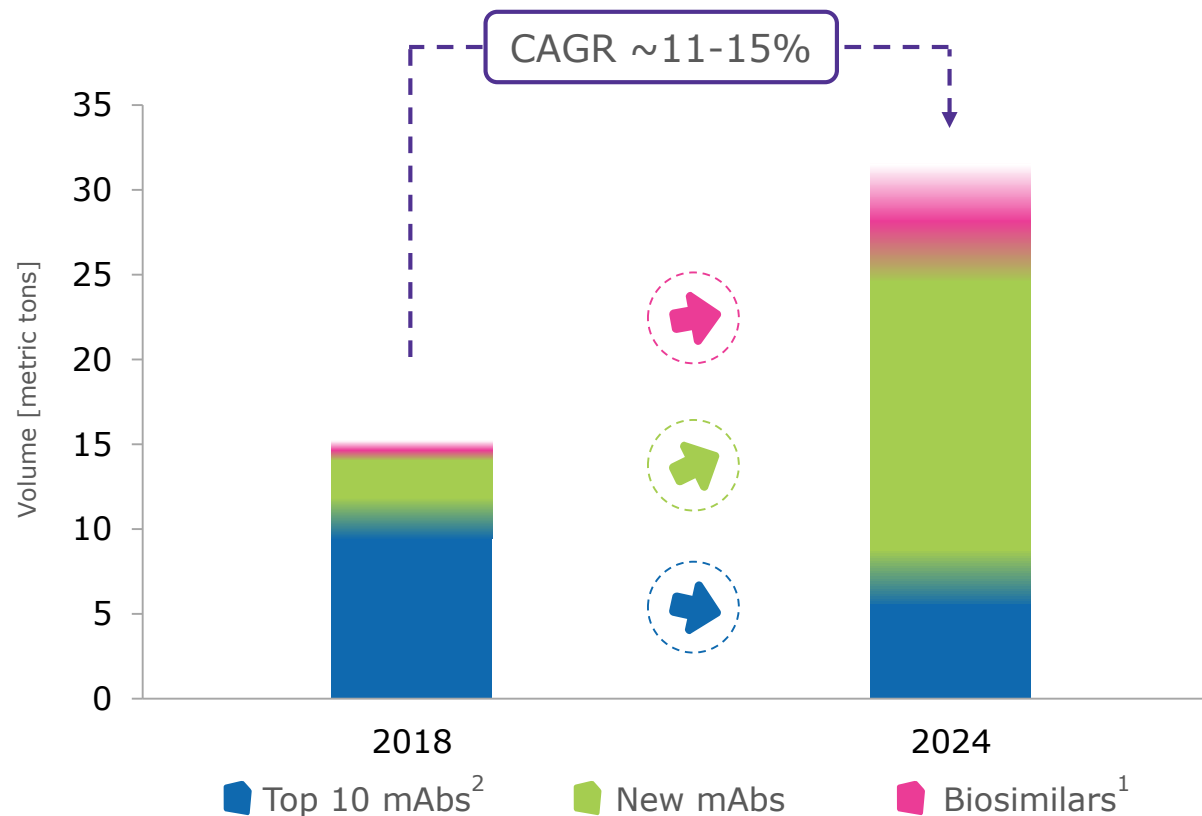
CAPEX required	\$20 m to \$100 m
Time to construct	1.5 years
Change over time	0.5 days
Footprint	~11,000 m <sup>2</sup>

**Strong demand for single-use technologies and Process Solutions' broad offering was and will remain a key source of growth for Life Science**

\*CAPEX = Capital Expenditure

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

### mAb volume projections 2018 to 2024



### Market development

- Overall mAbs market will grow ~11-15% CAGR
- Top 10 originator mAbs represent ~60% of market volume today and will decline to ~20% in 2024
- Biosimilars will gain share

<sup>1</sup>Biosimilars scaling factor = 2.8 based off internal estimates and McKinsey analysis; <sup>2</sup>Top 10 mAbs by 2017 volume, includes Enbrel.  
Source: EvaluatePharma | Sept 2018; mAbs = Monoclonal antibodies

## Applied Solutions

# Broad offering across the dynamic cell and gene therapy value chain



### Merck KGaA, Darmstadt, Germany offering

Develop **cutting-edge tools** for scientists to

- Uncover **foundational understanding**, e.g. CRISPR patent grants in 7 geographies
- **Modify** genetic functions, e.g. CRISPR/Cas 9 tools, library and reagents, ZFN

Create **cell lines and cell models** for testing **safety and efficacy**

- Pharmacokinetics (ADME)
- Toxicology testing
- Potency model
- Examples: primary human hepatocytes, Intestine, liver and kidney assays

- Offer cGMP clinical and commercial manufacturing, e.g. manufacture **viral vectors**
- Improve the **supply chain of cell therapy**, e.g. cell and gene therapy products and services

**Merck KGaA, Darmstadt, Germany is a supplier of novel products and services with a strong IP portfolio to meet the rapidly growing demand for novel therapies**

\*Abbreviations: CRISPR = Clustered Regularly Interspaced Short Palindromic Repeats; VGT = Virology and Gene Therapy, ZFN = zinc finger nuclease; ADME = absorption, distribution, metabolism, and excretion; GMP = good manufacturing practice

# Research Solutions

## Leading e-Commerce and operational excellence to serve customers

### unique customer Experience



Hundreds of  
thousands of products

SEARCH



Articles, protocols  
and peer reviewed  
papers



SCIENTIFIC  
CONTENT



Real-time pricing  
and availability

ORDER

### Highly reputable e-COMMERCE platform

**#1** in Life Science for web traffic

Ranking of websites:\*



<b>sigmaaldrich.com</b>	<b>No. 1</b>
thermofisher.com	No. 2
fishersci.com	No. 3
vwr.com	No. 4
<b>emdmillipore.com</b>	<b>No. 5</b>

**>100 M** unique visits

**>€ 1.5 Bn** sales

**>30%** of Merck KGaA, Darmstadt,  
Germany eCommerce orders contain  
products from former Sigma  
AND EMD Millipore

### Impeccable supply chain

**>300K** products

**~13 M** lines shipped  
per year

**~90%** fill rate globally

**>80%** of lines shipped  
within 24-48 hours in Western  
Europe and North America

\*Alexa report, global, all sectors – Web traffic ranking June 2018: sigmaaldrich.com = Rank 3,361, thermofisher.com = Rank 3,935, fishersci.com = Rank 17,473, vwr.com = Rank 27,061, emdmillipore.com = Rank 29,637

# Semiconductor Solutions

## Key enabler for digital trends

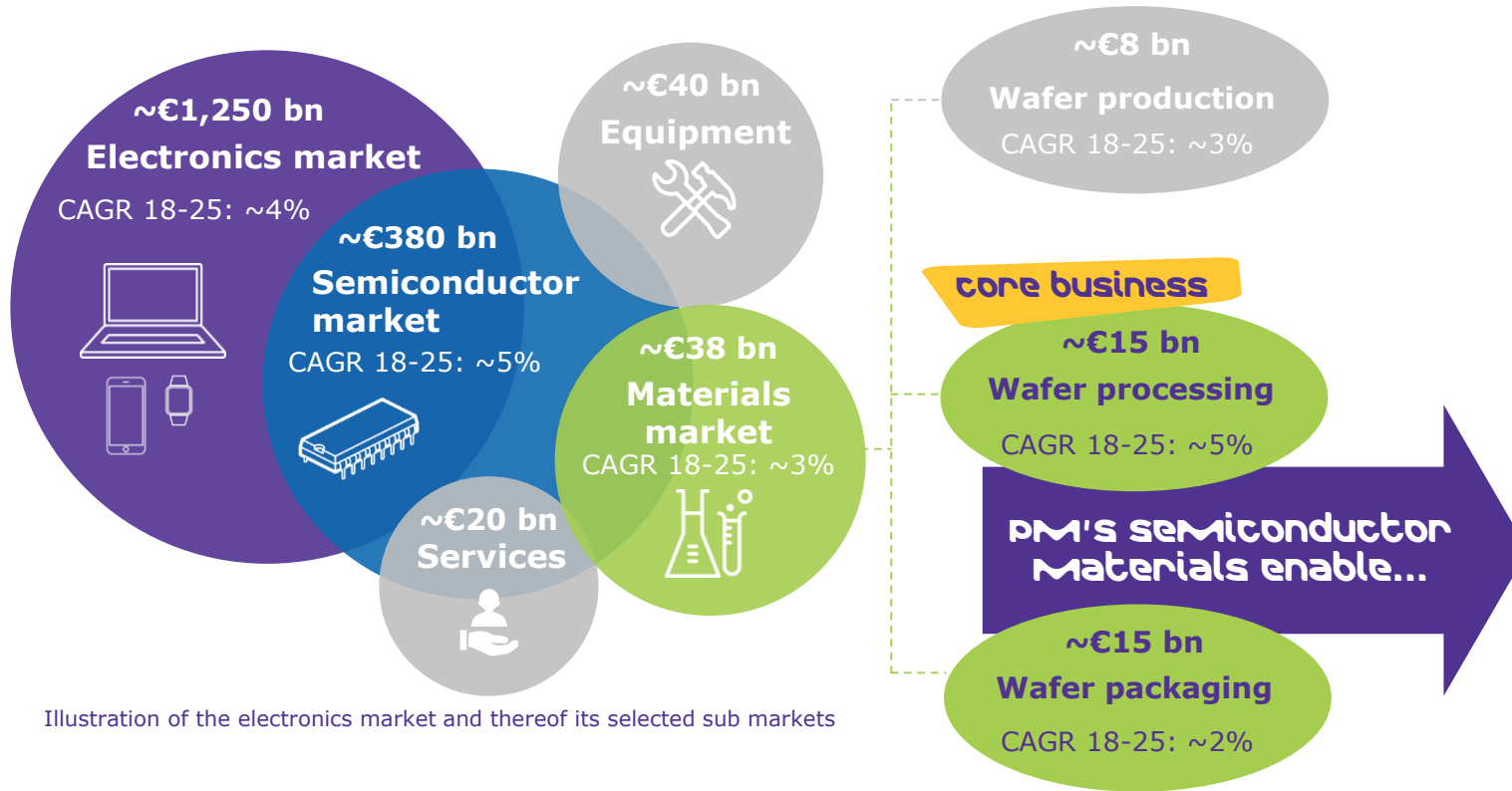


Illustration of the electronics market and thereof its selected sub markets

### ...customer needs

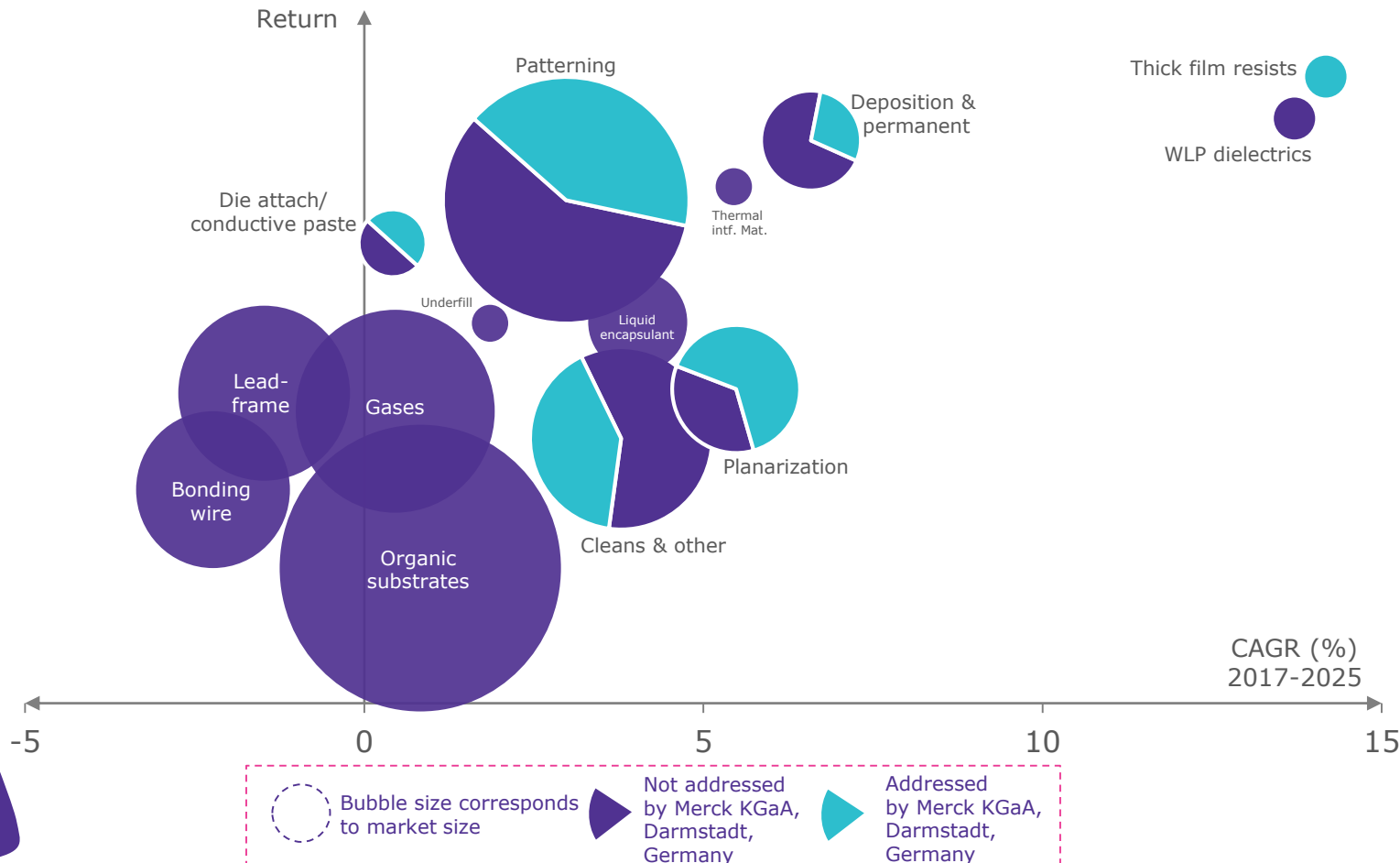
- Smaller structures beyond limitations of existing technologies
- Higher memory capacity, faster processing speed, less power consumption
- Improved yield and lower processing costs

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

# Semiconductor Solutions

## Well positioned in highly attractive market segments

Market landscape of wafer processing and packaging materials



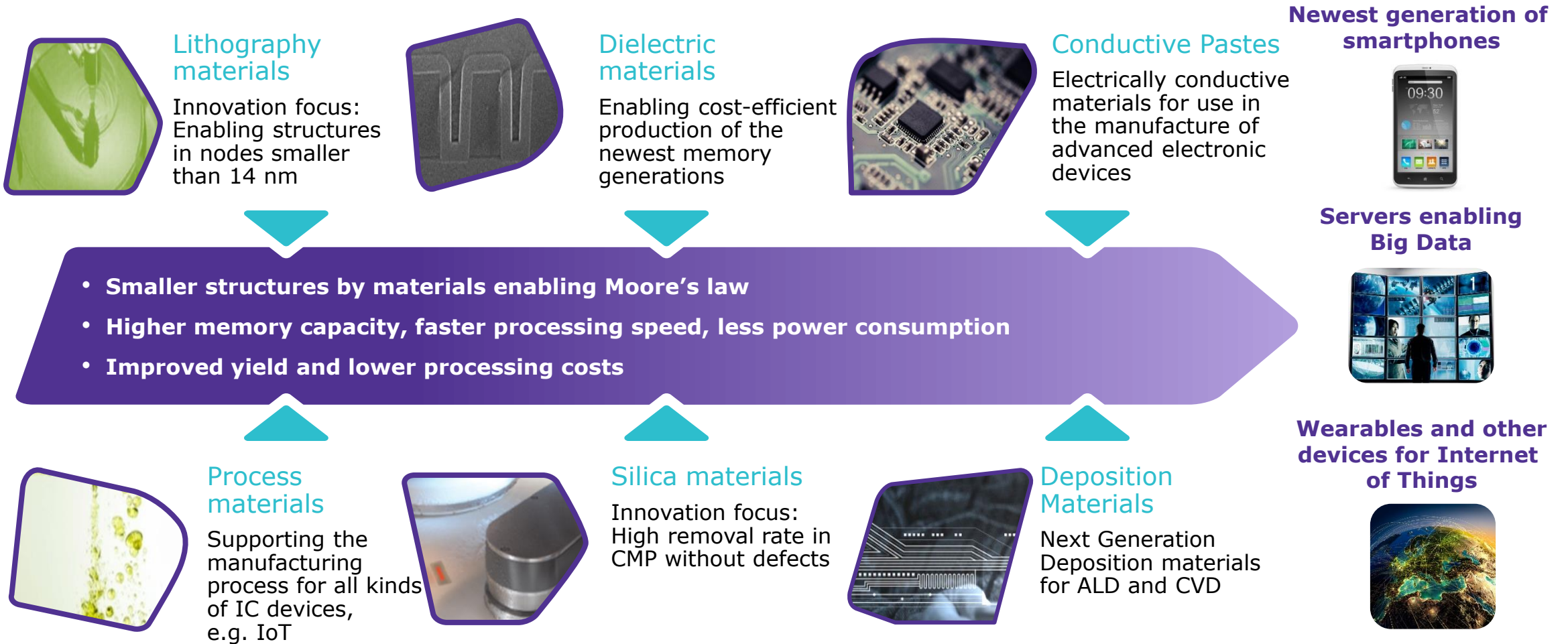
### Market positioning

- 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



# Semiconductor Solutions

## Enabler of key technology trends





# Semiconductor Solutions

## 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

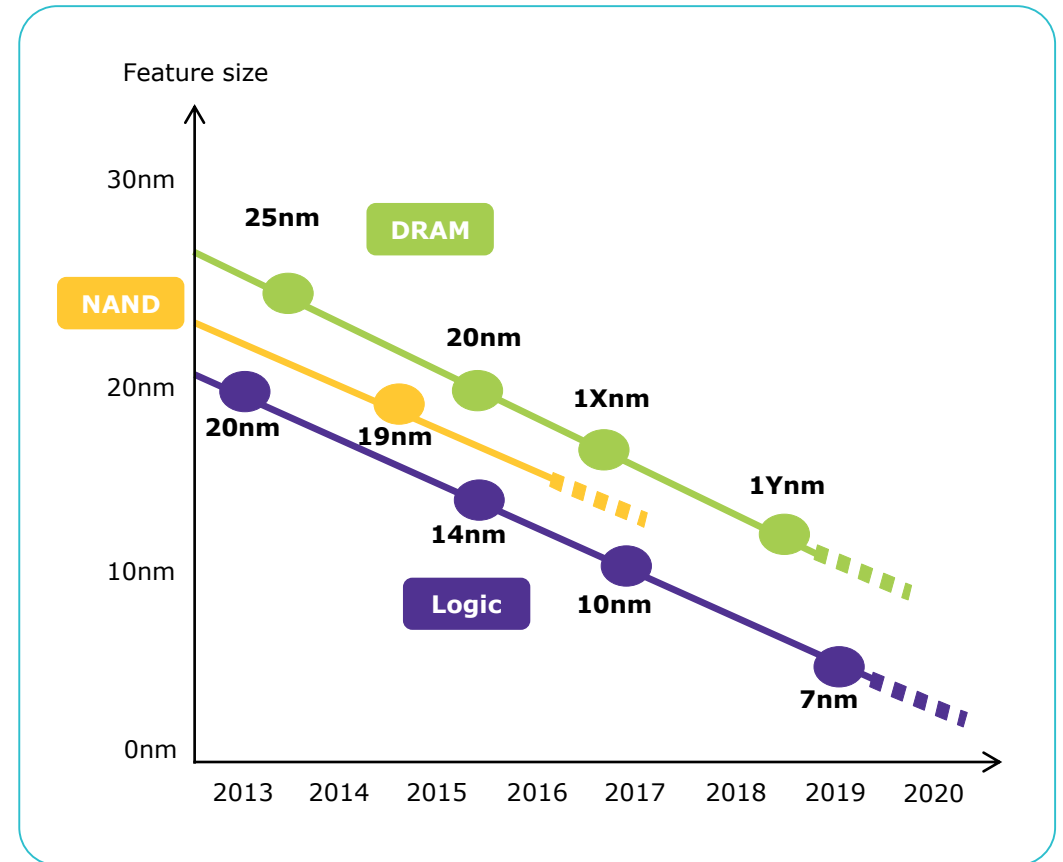
**Big Data:** Increasing need for intelligent data storage

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

### Selected competitors

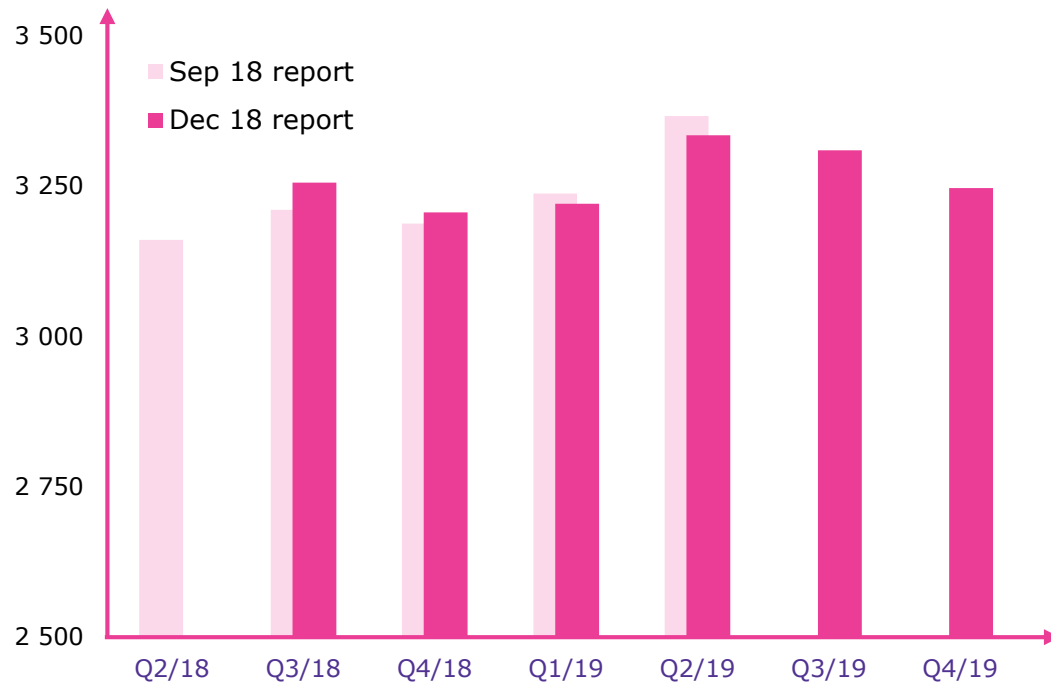
- Tokyo Ohka Kogyo
- Dow Electronic Materials
- Nissan Chemicals
- JSR

### Feature sizes develop as predicted by Moore's law



# 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 3.2% in 2019

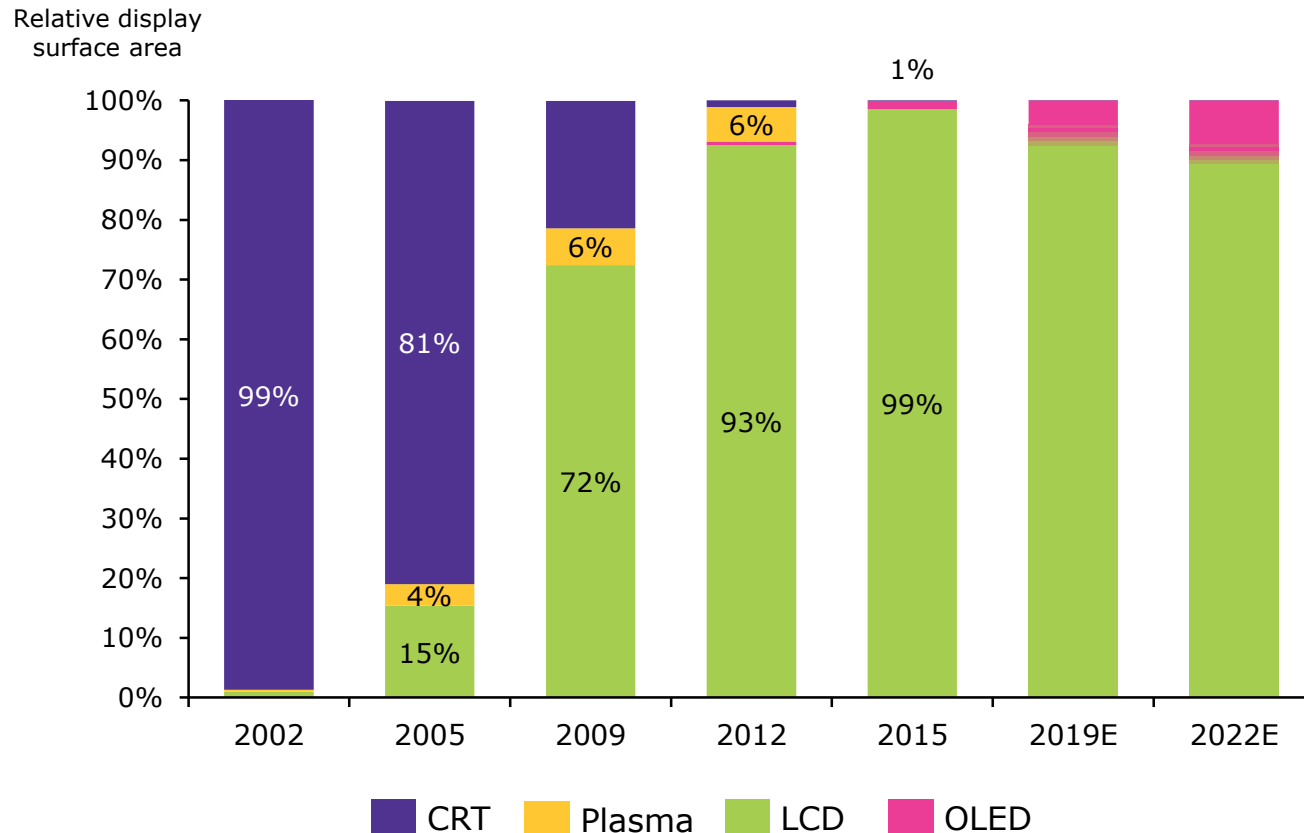
**Total Semiconductor Market is strongly influenced by memory pricing, while the Materials Market is correlated with the wafer area**

Source: Linx Consulting ESF reports;  
\*MSI = Million Square Inches

# Display Solutions

## 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

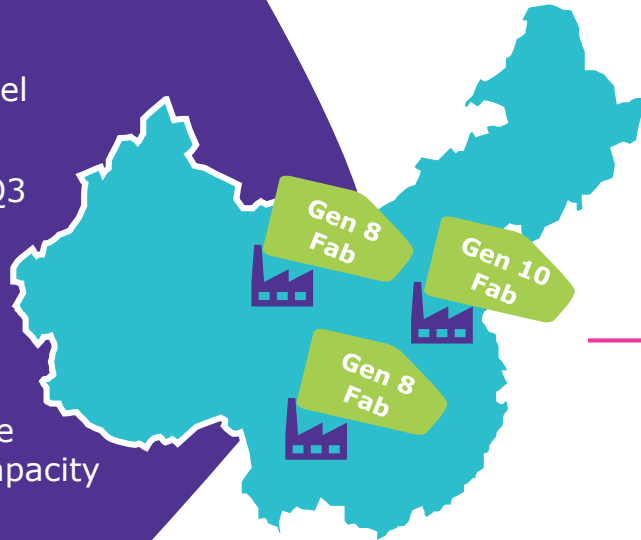
**LCD progress creates higher technological and commercial entry barriers**

**OLED share will increase in mobile applications**

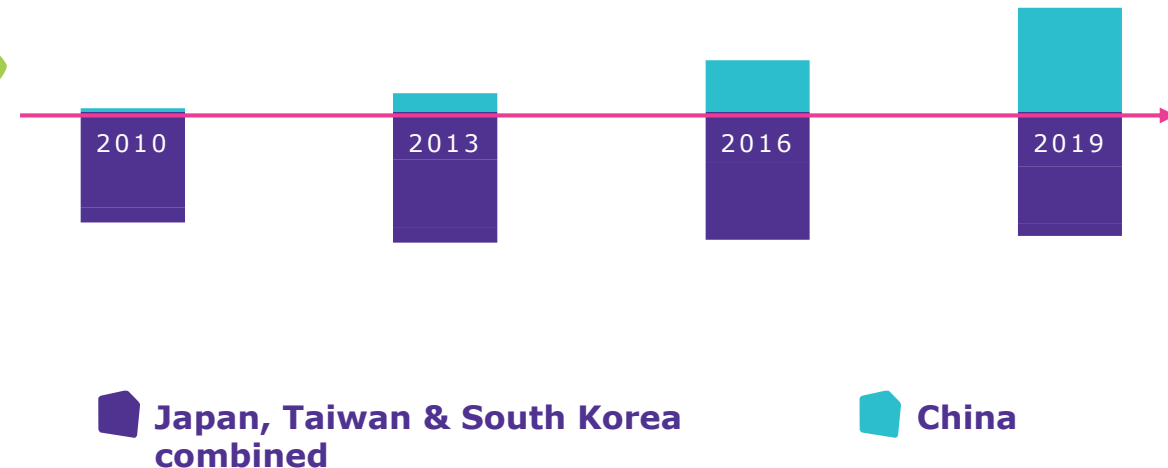
# Performance Materials: Liquid crystals currently benefitting from new display-panel plant capacity ramp up projects

## 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



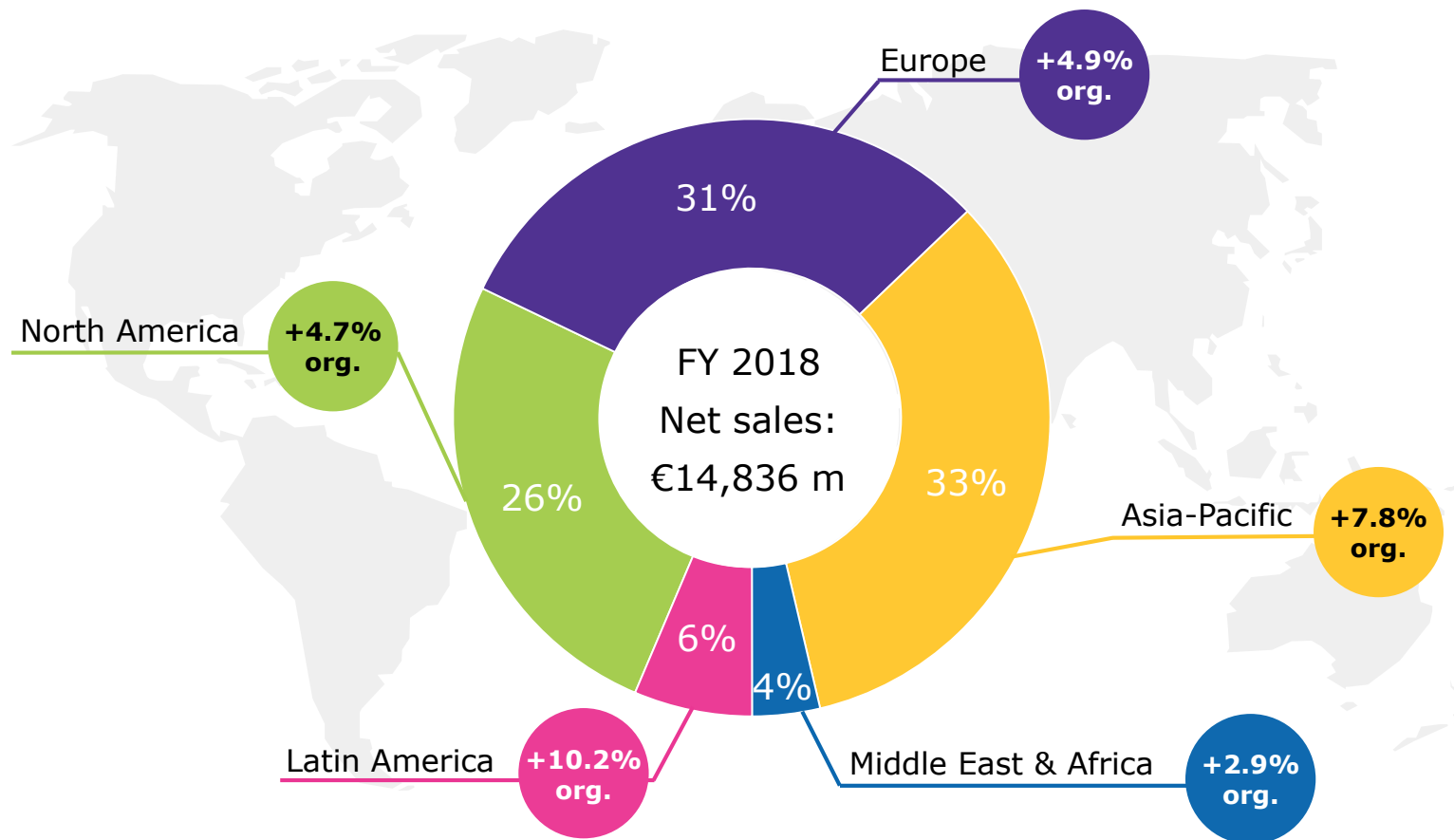
Share of global display production capacities by region [km<sup>2</sup>]\*



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

# Organic growth in all regions

## Regional breakdown of net sales [€ m]



## Regional organic development

- Solid growth in Europe reflects ongoing strong demand in Life Science; Strong Mavenclad<sup>®</sup> ramp-up offsets Rebif<sup>®</sup> decline
- Solid growth in North America due to strong Life Science; Fertility and Bavencio<sup>®</sup> offsetting ongoing decline of Rebif<sup>®</sup>
- APAC shows strong growth fueled by double-digit growth of Life Science, Fertility and Glucophage<sup>®</sup>; Semiconductor Solutions and OLED more than offset LC decline
- Double-digit growth in LATAM reflects strong demand in Life Science and Healthcare's core business
- Middle East and Africa driven by ongoing solid demand for Fertility and Glucophage<sup>®</sup>

# FY 2018 Financials: Overview

## Key figures

[€m]	FY 2017	FY 2018	Δ
Net sales	14,517	<b>14,836</b>	2.2%
EBITDA pre	4,246	<b>3,800</b>	-10.5%
Margin (in % of net sales)	29.3%	25.6%	
EPS pre	5.92	<b>5.10</b>	-13.9%
Operating cash flow	2,696	<b>2,219</b>	-17.7%

[€m]	Dec. 31, 2017	Dec. 31, 2018	Δ
Net financial debt	10,144	<b>6,701</b>	-33.9%
Working capital	3,387	<b>3,486</b>	2.9%
Employees <sup>2</sup>	52,941	<b>51,749</b>	-2.2%

## Comments

- EBITDA pre and margin reduction driven by FX effects, PM decline, investments in HC and LS, LTIP<sup>1</sup> costs and last year non-recurring income in HC
- Lower EPS pre in line with EBITDA pre decline
- Lower operating cash flow reflects declining profitability of PM as well as investments in Healthcare
- Reduced net financial debt reflects strong focus on deleveraging and proceeds from Consumer Health disposal
- Working capital increase driven by higher volume growth

<sup>1</sup>LTIP = Long Term Incentive Plan; <sup>2</sup>2017 employees number includes CH Headcount ~3.400;  
Totals may not add up due to rounding

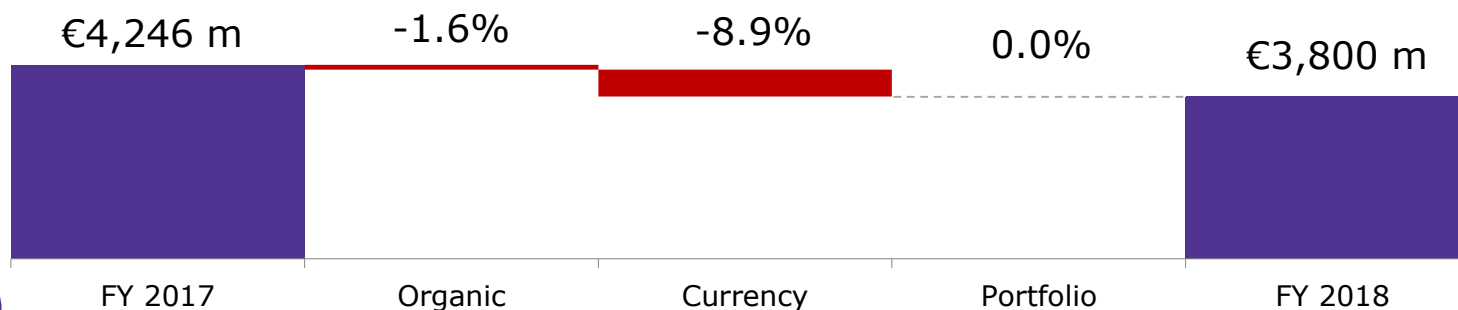
# All business segments drive organic growth overcompensating FX headwinds

## FY 2018 YoY net sales

	Organic	Currency	Portfolio	Total
Healthcare	5.2%	-4.3%	0.0%	<b>0.9%</b>
Life Science	8.8%	-3.6%	0.0%	<b>5.2%</b>
Performance Materials	1.7%	-3.4%	0.0%	<b>-1.7%</b>
Group	6.1%	-3.9%	0.0%	<b>2.2%</b>

- Solid organic growth in Healthcare reflects increasing contribution of Mavenclad<sup>®</sup> and Bavencio<sup>®</sup> and solidly growing core business
- Life Science posts above-market growth driven by all business segments
- Growth in Performance Materials due to strong Semiconductor and OLED; LC down despite benefit from plant ramp-up projects in China

## FY 2018 YoY EBITDA pre



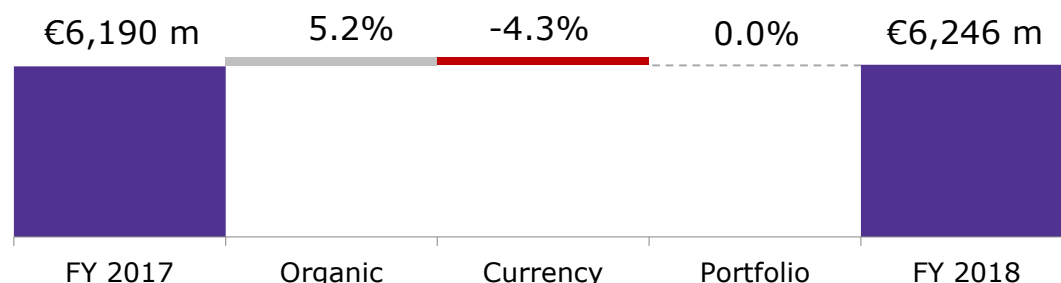
- Organic decline of EBITDA pre driven by LS strategic investments, PM business mix and Healthcare's LY non-recurring income
- Currency effects (~€380 m) mainly related to EUR/USD development, strong depreciation of LATAM currencies and negative hedging result from Q1 onwards

# Healthcare: Solid organic sales growth while profitability declines amid FX headwinds and last year non-recurring income

## Healthcare P&L

[€m]	FY 2017	FY 2018
Net sales	6,190	<b>6,246</b>
Marketing and selling	-2,373	<b>-2,339</b>
Administration	-271	<b>-301</b>
Research and development	-1,600	<b>-1,686</b>
EBIT	1,337	<b>731</b>
EBITDA	2,028	<b>1,492</b>
EBITDA pre	1,773	<b>1,556</b>
Margin (in % of net sales)	28.6%	<b>24.9%</b>

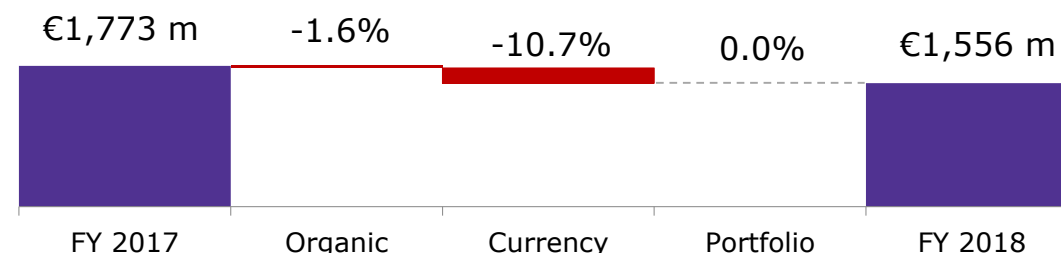
## Net sales bridge



## Comments

- Organic growth supported by strong General Medicine and Fertility; 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>
- Flat Erbitux<sup>®</sup> driven by strong growth in LatAm amid 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 (especially Rebif<sup>®</sup> and Erbitux<sup>®</sup>)
- R&D costs increased due to investments in progressing pipeline
- Profitability reflects significant FX headwinds, unfavorable product mix and R&D investments mitigated by Peg-Pal milestone (~€50 m) and portfolio activities (~€130 m); Last year included Bavencio<sup>®</sup> Milestone payments and royalty income swap (~€240 m)

## EBITDA pre bridge



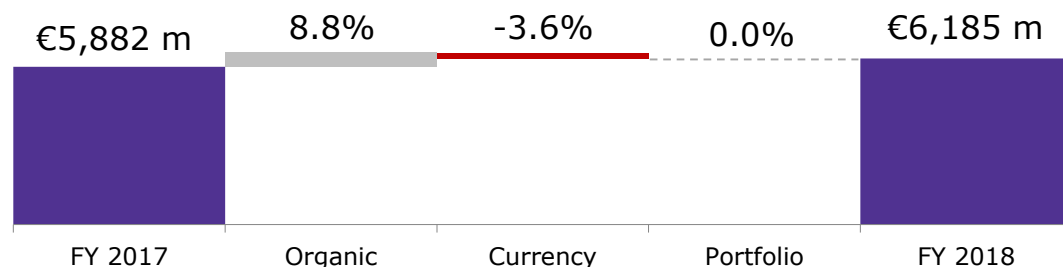


# Life Science: Strong organic sales growth across all businesses

## Life Science P&L

[€m]	FY 2017	FY 2018
Net sales	5,882	<b>6,185</b>
Marketing and selling	-1,734	<b>-1,775</b>
Administration	-261	<b>-282</b>
Research and development	-241	<b>-249</b>
EBIT	834	<b>1,036</b>
EBITDA	1,580	<b>1,756</b>
EBITDA pre	1,786	<b>1,840</b>
Margin (in % of net sales)	30.4%	<b>29.8%</b>

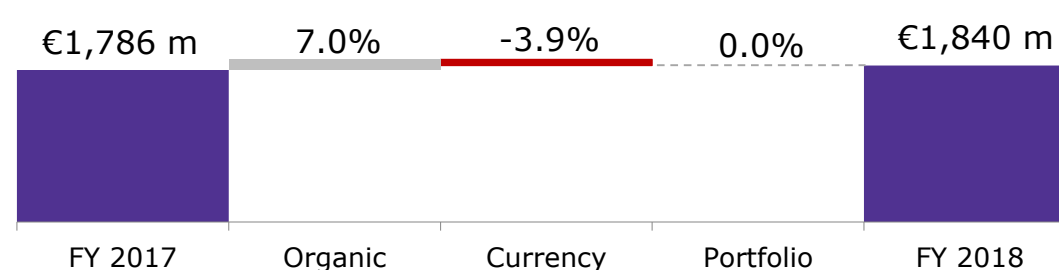
## Net sales bridge



## Comments

- Double-digit growth in Process Solutions fueled by continuing high demand across all businesses, especially single use and filtration
- Applied Solutions posts growth across all businesses, mainly due to advanced analytical and introduction of new lab water platform
- Solid organic growth in Research Solutions driven by all major businesses across all regions, mainly reagents and laboratory & specialty chemicals
- Strategic investments in viral vector manufacturing, single-use bioprocessing and China expansion start to impact topline growth
- EBITDA pre reflects strong top-line growth, offset by investments in eCommerce and strategic initiatives as well as LTIP<sup>1</sup> provisions and FX headwinds

## EBITDA pre bridge



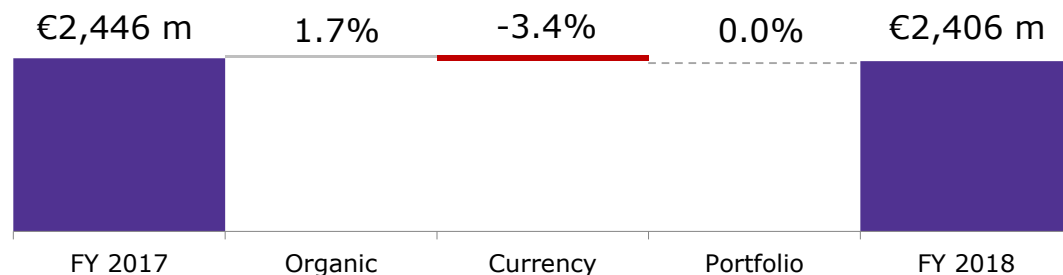
Totals may not add up due to rounding  
<sup>1</sup>LTIP = Long-term incentive plan

# Performance Materials: Positive organic growth due to strong demand for Semiconductor Solutions and OLED offsetting LC decline

## Performance Materials P&L

[€m]	FY 2017	FY 2018
Net sales	2,446	<b>2,406</b>
Marketing and selling	-242	<b>-255</b>
Administration	-72	<b>-90</b>
Research and development	-225	<b>-242</b>
EBIT	689	<b>508</b>
EBITDA	947	<b>769</b>
EBITDA pre	980	<b>786</b>
Margin (in % of net sales)	40.1%	<b>32.7%</b>

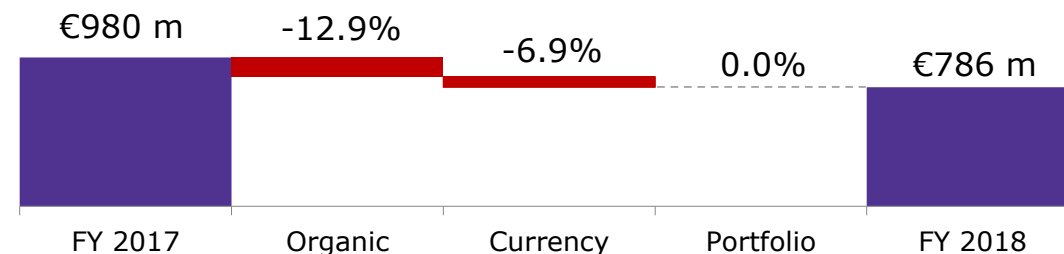
## Net sales bridge



## Comments

- Organic growth driven by growth of Semiconductor and OLED overcompensating Liquid Crystals decline; Liquid Crystals benefited from new plant ramp-up projects in China
- Stronger demand for innovative UB-FFS technology
- Semiconductor Solutions with above-market growth due to strong demand for dielectric and lithography materials
- Surface Solutions softer driven by slowdown of automotive end market
- Increased R&D due to Semiconductor Solutions related projects
- Lower profitability reflects negative business mix, ongoing Liquid Crystals decline and FX headwinds

## EBITDA pre bridge



# Reported figures

## Reported results

[€m]	FY 2017	FY 2018	Δ
EBIT	2,423	<b>1,727</b>	-28.7%
Financial result	-294	<b>-266</b>	-9.6%
Profit before tax	2,129	<b>1,461</b>	-31.4%
Income tax	428	<b>-368</b>	n.m.
<i>Effective tax rate (%)</i>	<i>-20.1%</i>	<b>25.2%</b>	
Net income <sup>*</sup>	2,605	<b>3,374</b>	29.5%
EPS (€) <sup>*</sup>	5.99	<b>7.76</b>	29.5%

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

## Comments

- Lower EBIT reflects FX headwinds, negative business mix in PM; LY EBIT driven by non-recurring income in HC, Biosimilars disposal gain (~ €319 m) and write-up of Vevey site (~ €70 m)
- Improved financial result due to tax effects and deleveraging
- Profit before tax in line with EBIT decrease
- Last year effective tax rate reflects revaluation of deferred tax liabilities due to U.S. tax reform
- Effective tax rate within guidance range of ~24-26%
- Increased net income and EPS reflects Consumer Health disposal

# Cash flow statement

## FY 2018 – cash flow statement

[€m]	FY 2017	FY 2018	Δ
Profit after tax	2,615	<b>3,396</b>	781
D&A	1,758	<b>1,812</b>	54
Changes in provisions	103	<b>199</b>	95
Changes in other assets/liabilities	-1,256	<b>-288</b>	968
Other operating activities	-354	<b>-2,722</b>	-2,368
Changes in net working capital	-170	<b>-178</b>	-8
Operating cash flow	2,696	<b>2,219</b>	-477
Investing cash flow	-1,147	<b>2,191</b>	3,338
thereof Capex on PPE	-919	<b>-910</b>	9
Financing cash flow	-1,870	<b>-2,825</b>	-955

## Cash flow drivers

- Profit after tax driven by disposal gain (+ €2.2 bn) from Consumer Health, which is neutralized in other operating activities
- Last year profit after tax reflects one time U.S. tax reform effect
- D&A increase due to low base last year related to write up of Vevey site (~€70 m)
- Changes in other assets/liabilities reflects last year neutralizing of non-cash relevant U.S. tax gain
- Higher investing cash flow reflects Consumer Health disposal
- Financing cash flow reflects repayment of bank loans, commercial papers and USD400 m bond

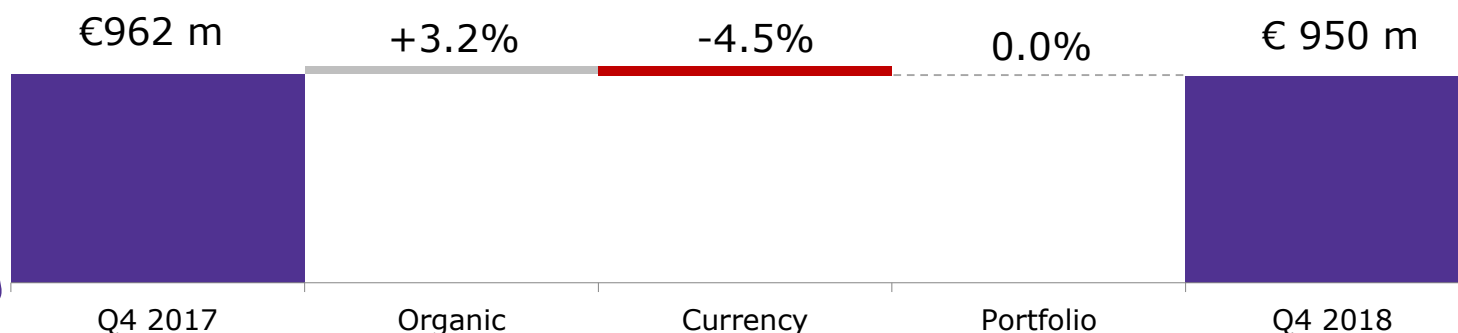
## Organic growth driven by Life Science and Healthcare

### Q4 2018 YoY net sales

	Organic	Currency	Portfolio	Total
Healthcare	5.5%	-1.9%	0.0%	<b>3.6%</b>
Life Science	8.8%	0.0%	0.0%	<b>8.8%</b>
Performance Materials	7.8%	1.0%	0.0%	<b>8.8%</b>
Group	7.2%	-0.7%	0.0%	<b>6.6%</b>

- Healthcare driven by strong demand for Glucophage<sup>®</sup>, Concor<sup>®</sup> and Fertility; Bavencio<sup>®</sup> offset Erbitux<sup>®</sup> decline; Rebif<sup>®</sup> decline partially mitigated by Mavenclad<sup>®</sup>
- Life Science with above-market growth driven by all business segments across all major regions
- Strong growth in Performance Materials due to continued strong demand for Semiconductor and OLED; Liquid Crystals benefiting from capacity ramp-up projects in China

### Q4 YoY EBITDA pre



- Organic growth of EBITDA pre driven by HC non-recurring income and LS performance, mitigated by PM business mix and higher LTIP<sup>1</sup> provisions
- Currency effects (~€45 m) mainly relate to negative hedging result and ARS<sup>2</sup> development

Totals may not add up due to rounding;  
<sup>1</sup>LTIP = Long-term incentive plan; <sup>2</sup>ARS = Argentine peso

## Q4 2018: Overview

### Key figures

[€m]	Q4 2017	Q4 2018	Δ
Net sales	3,648	<b>3,888</b>	6.6%
EBITDA pre	962	<b>950</b>	-1.3%
Margin (in % of net sales)	26.4%	24.4%	
EPS pre	1.25	<b>1.22</b>	-2.4%
Operating cash flow	642	<b>741</b>	15.4%

[€m]	Dec. 31, 2017	Dec. 31, 2018	Δ
Net financial debt	10,144	<b>6,701</b>	-33.9%
Working capital	3,387	<b>3,486</b>	2.9%
Employees	52,941	<b>51,749</b>	-2.2%

### Comments

- EBITDA pre margin reduction reflects FX headwinds, negative business mix in PM, higher LTIP<sup>1</sup> and hedging costs
- Lower EPS pre in line with EBITDA pre decline
- Higher operating cash flow reflects improved working capital management
- Working capital driven by strong volume growth

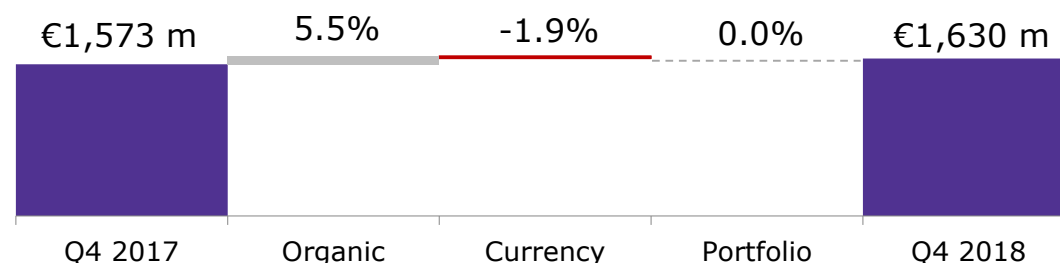
Totals may not add up due to rounding;  
<sup>1</sup>LTIP = Long Term Incentive Plan

# Healthcare: Profitability driven by active portfolio development and strong topline

## Healthcare P&L

[€m]	Q4 2017	Q4 2018
Net sales	1,573	<b>1,630</b>
Marketing and selling	-606	<b>-625</b>
Administration	-68	<b>-76</b>
Research and development	-434	<b>-492</b>
EBIT	70	<b>190</b>
EBITDA	300	<b>403</b>
EBITDA pre	339	<b>414</b>
Margin (in % of net sales)	21.6%	<b>25.4%</b>

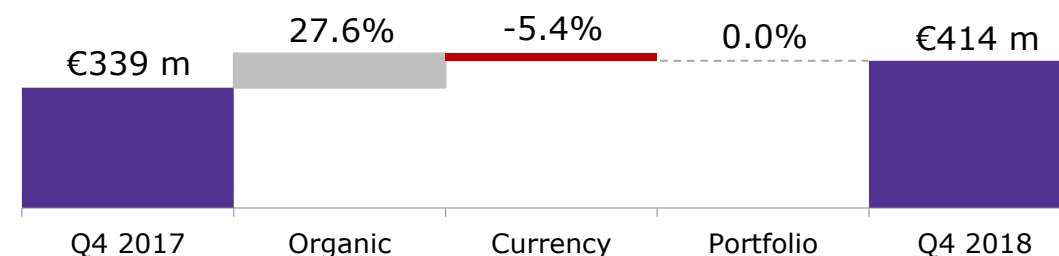
## Net sales bridge



## Comments

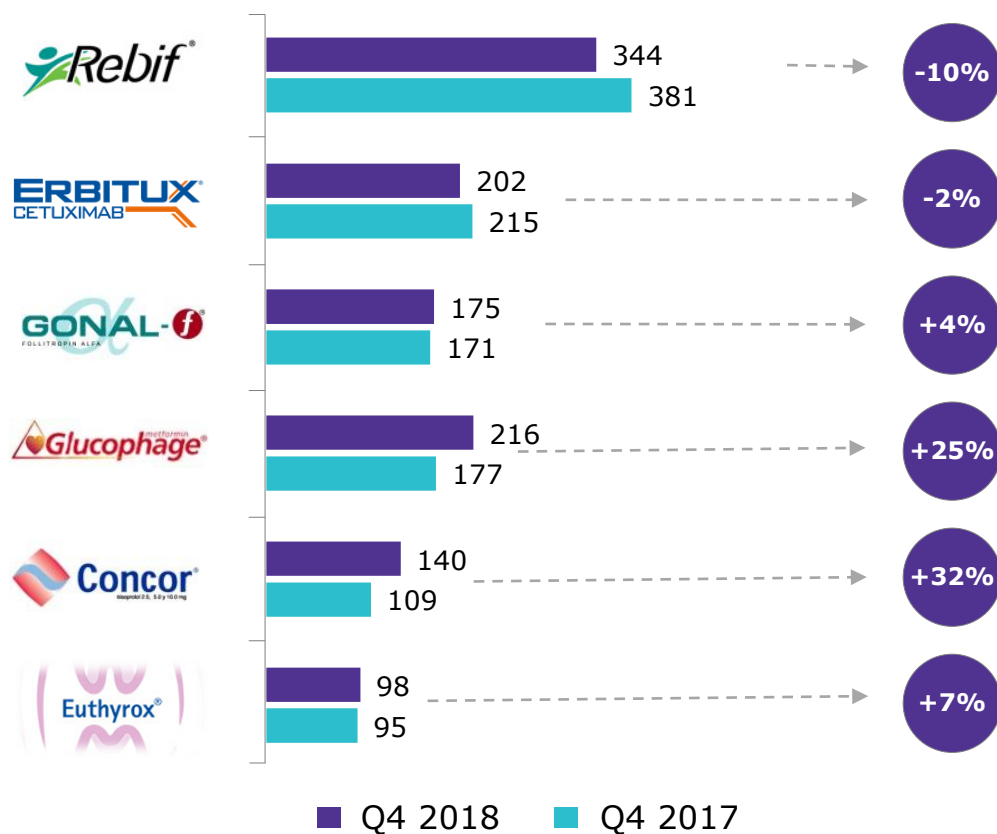
- Solid organic top-line due to double-digit growth of Fertility, Glucophage<sup>®</sup> and Concor<sup>®</sup>; Mavenclad<sup>®</sup> and Bavencio<sup>®</sup> strong
- Increasing contribution from Mavenclad<sup>®</sup> almost offsets ongoing decline of Rebif<sup>®</sup> from competition in U.S. and Europe
- Erbitux<sup>®</sup> with slight organic decrease reflecting ongoing competition and price pressure in major markets mitigated by volume growth in China
- Increased marketing and selling driven by launch preparation for potential Mavenclad<sup>®</sup> approval in U.S.
- R&D investments consistent with pipeline progress
- EBITDA pre reflects active portfolio development (~€110 m), strong top-line contribution partially offset by R&D and M&S investments as well as FX headwinds

## EBITDA pre bridge

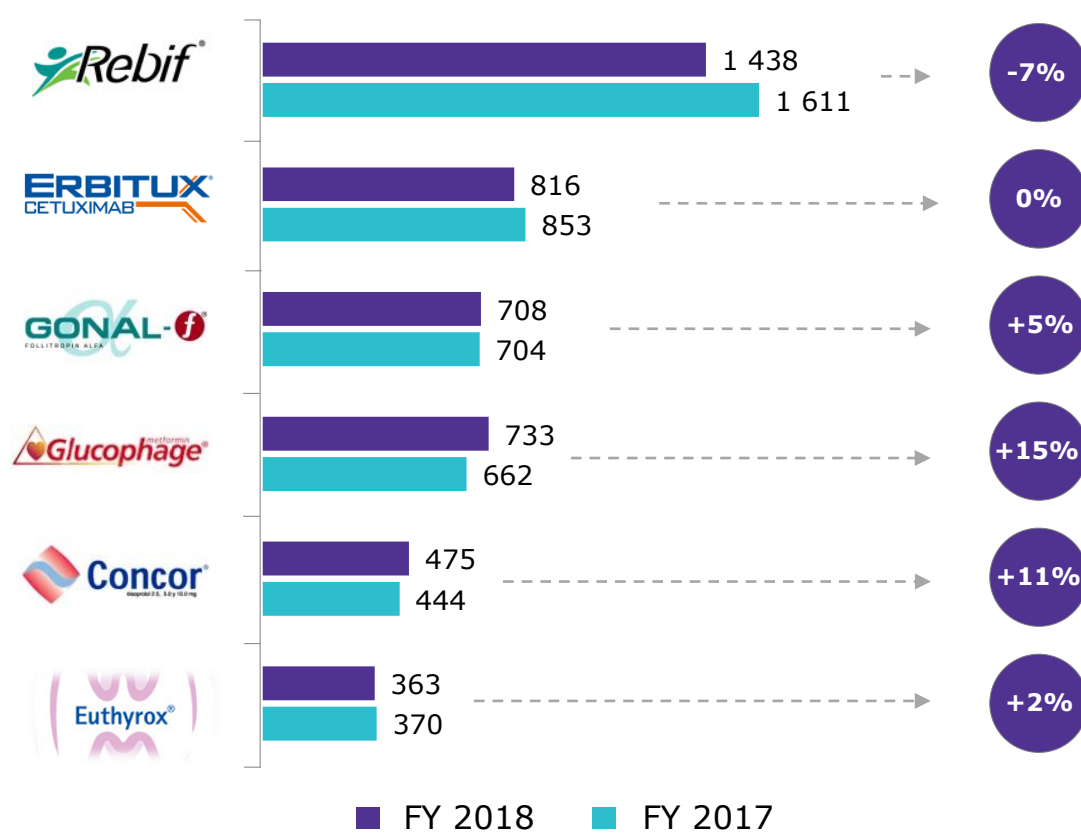


# Healthcare organic growth by franchise/product

Q4 2018 organic sales growth [%]  
by key product [€ m]



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



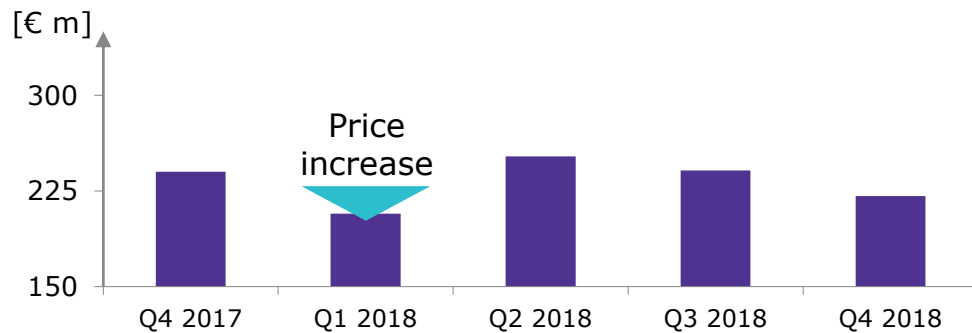
Totals may not add up due to rounding



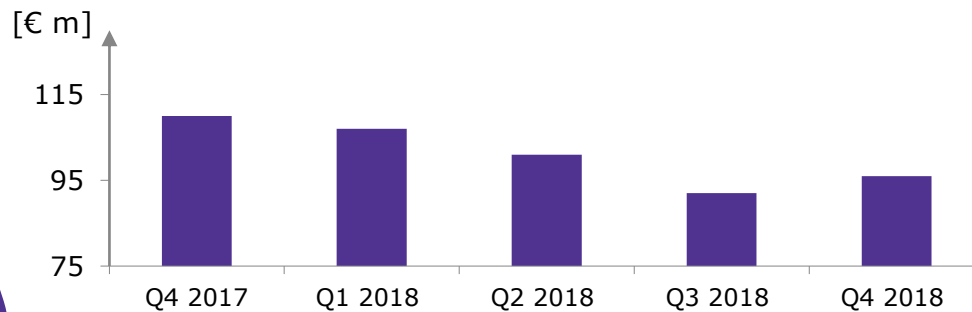
# Rebif®: Ongoing decline in line with interferon market

## Rebif® sales evolution

### North America



### Europe



## Q4 2018 Rebif® performance

### Q4 drivers

-11.3% org.

- Price
- Volume
- FX

- Rebif® sales of €344 m in Q4 2018 reflect organic decline of -10.3% amid stable FX effect of 0.6%
- U.S. and European volume declines mainly due to competition from orals
- Market shares within interferons stable due to high retention rates and known long-term track record

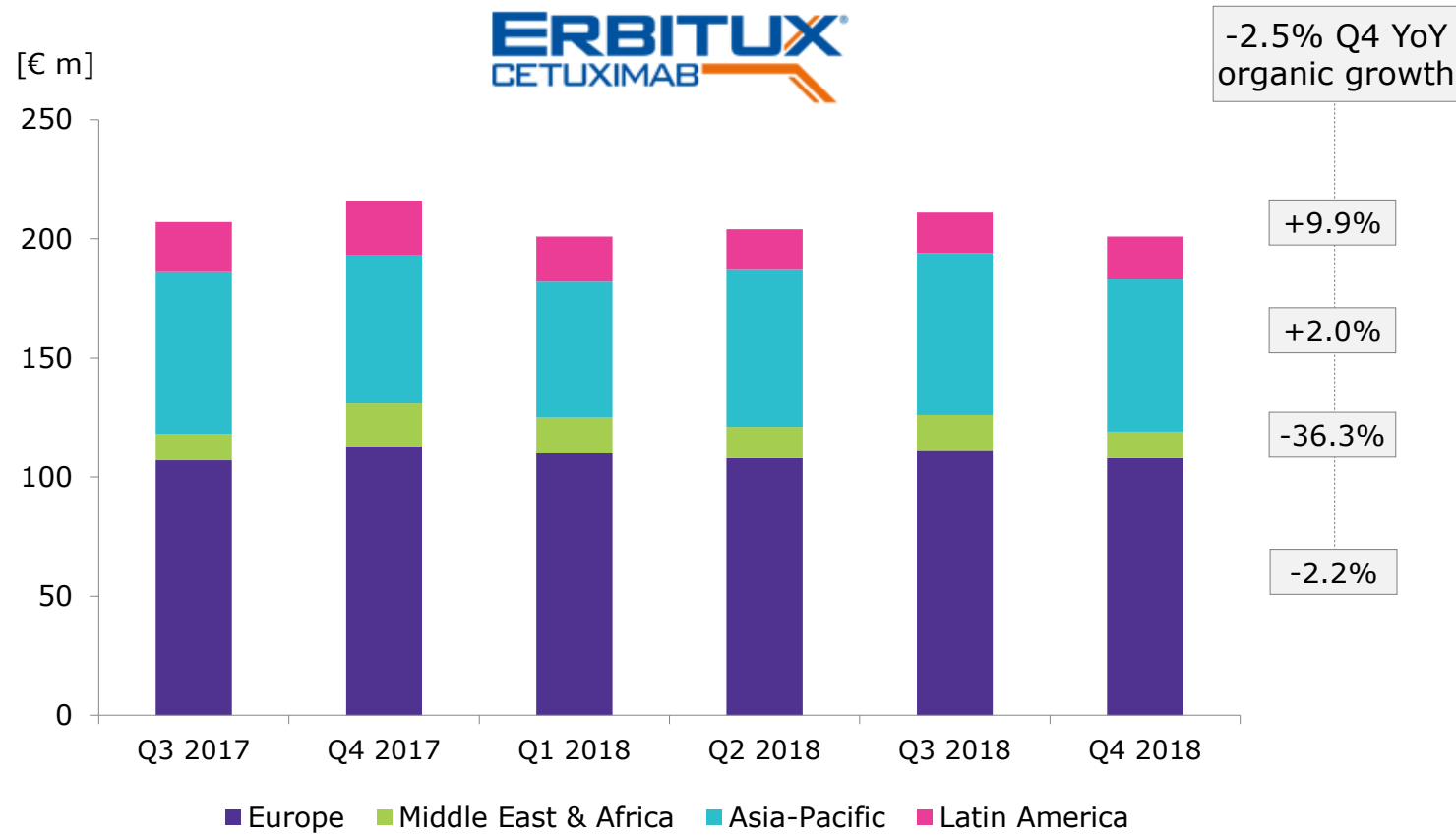
### Q4 drivers

-12.1% org.

- Price
- Volume
- FX

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

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



## Q4 2018 Erbitux<sup>®</sup> performance

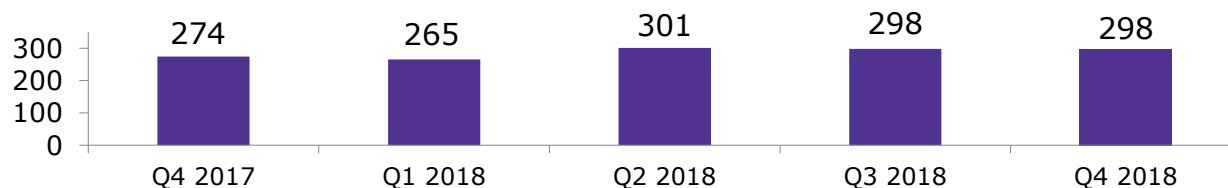
- Absolute sales decrease to €202 m, due to organic low single-digit decline and FX headwinds
- Organic decline in Europe driven by ongoing competition, price reductions and shrinking market size due to immuno-oncology trials
- MEA reflects tender phasing due to import permit
- APAC with organic growth mainly driven by strong demand in China

# Double-digit organic growth of Fertility and General Medicine

## Sales evolution

### Fertility

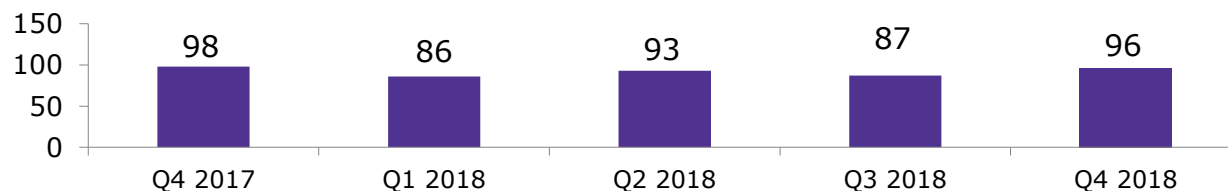
[€ m]



Organic  
+10.7% org.

### Endocrinology

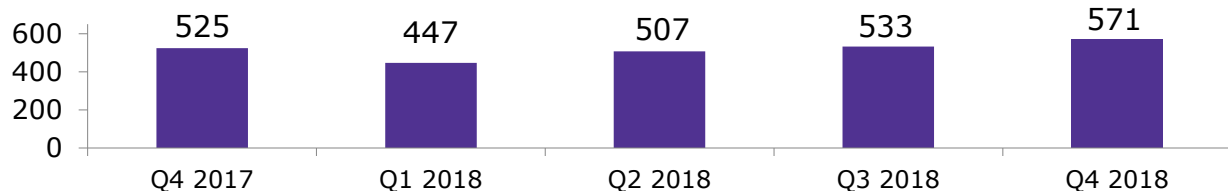
[€ m]



Organic  
+1.4% org.

### General Medicine\*

[€ m]



Organic  
+13.0% org.

## Q4 2018 organic drivers

- Fertility posts double-digit growth driven by growth across all regions, mainly APAC and North America
- Gonal-f<sup>®</sup> solid organic growth, supported by increasing demand in North America amid competitive pressure in Europe
- Remaining portfolio shows ongoing strong demand, especially in China and Europe
- Endocrinology posts slight organic growth due to strong LATAM and moderate growth in Europe, mitigated by lower demand in the U.S.
- General Medicine sees double-digit growth of Glucophage<sup>®</sup> and Concor<sup>®</sup> (China & MEA)

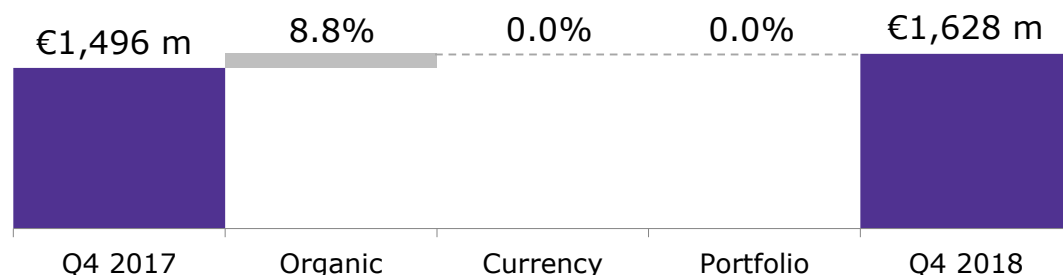
\*includes "CardioMetabolic Care & General Medicine and Others

# Life Science: Strong organic growth while strategic initiatives weigh on profitability

## Life Science P&L

[€m]	Q4 2017	Q4 2018
Net sales	1,496	<b>1,628</b>
Marketing and selling	-431	<b>-473</b>
Administration	-66	<b>-83</b>
Research and development	-52	<b>-70</b>
EBIT	156	<b>232</b>
EBITDA	338	<b>422</b>
EBITDA pre	461	<b>474</b>
Margin (in % of net sales)	30.8%	<b>29.1%</b>

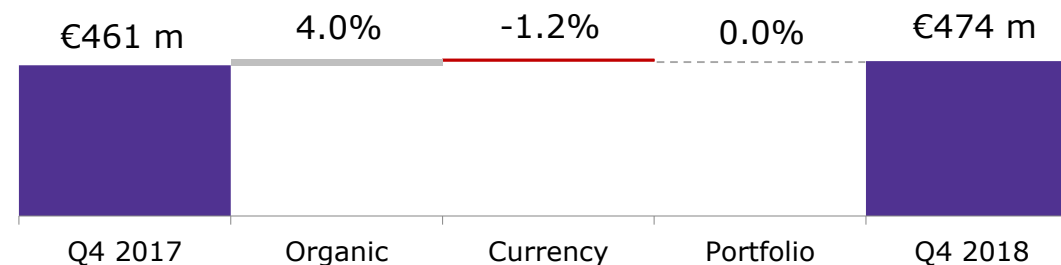
## Net sales bridge



## Comments

- Double-digit growth in Process Solutions due to ongoing strong demand across all businesses, especially for filtration and single-use
- Applied Solutions posts solid growth reflecting continued strong momentum across the portfolio, mainly analytics and gene editing
- Research Solutions with moderate organic growth – continuing positive demand trends across all businesses and regions
- M&S increase driven by strong topline growth and strategic investments
- Investments in eCommerce and strategic initiatives as well as higher LTIP<sup>1</sup> provisions weigh on EBITDA pre

## EBITDA pre bridge



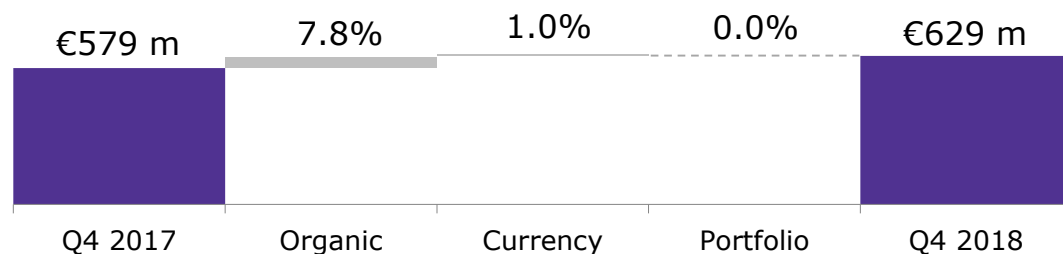
Totals may not add up due to rounding;  
<sup>1</sup>LTIP = Long Term Incentive Plan

# Performance Materials: Organic growth driven by LCD capacity ramp-up projects in China while profitability trends towards 30%

## Performance Materials P&L

[€m]	Q4 2017	Q4 2018
Net sales	579	<b>629</b>
Marketing and selling	-61	<b>-72</b>
Administration	-18	<b>-26</b>
Research and development	-52	<b>-59</b>
EBIT	136	<b>98</b>
EBITDA	213	<b>183</b>
EBITDA pre	228	<b>191</b>
Margin (in % of net sales)	39.4%	<b>30.3%</b>

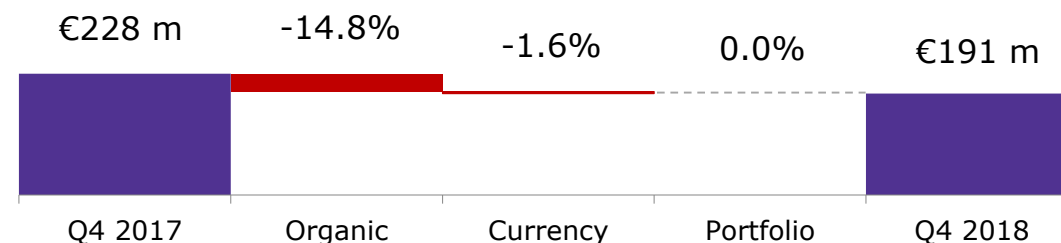
## Net sales bridge



## Comments

- Strong organic growth of PM due to continuing strong demand for Semiconductor Solutions & OLED; Ongoing but temporary ramp-up of new panel plant projects in China supporting Liquid Crystals
- Semiconductor Solutions with above-market growth driven by strong demand for dielectrics and lithography materials, especially in APAC
- Surface Solutions softer driven by slowdown of automotive end market
- Marketing and selling in line with strong top-line growth
- Higher R&D due to projects in Semiconductor Solutions and OLED application lab in China
- Profitability driven by negative business mix, ongoing Liquid Crystals decline and LTIP<sup>1</sup> provisions

## EBITDA pre bridge



Totals may not add up due to rounding;  
<sup>1</sup>LTIP = Long Term Incentive Plan

# Reported figures

## Reported results

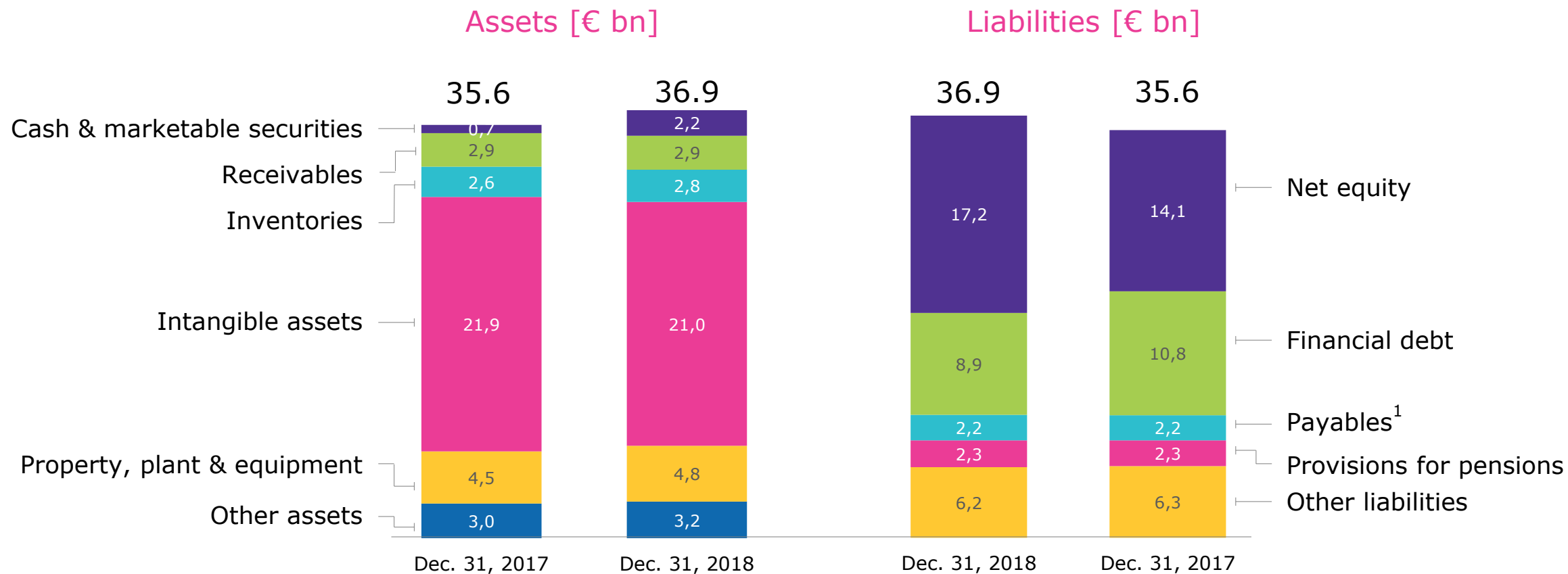
[€m]	Q4 2017	Q4 2018	Δ
EBIT	240	<b>341</b>	42.0%
Financial result	-94	<b>-84</b>	-10.5%
Profit before tax	146	<b>257</b>	76.0%
Income tax	886	<b>-64</b>	n.m.
<i>Effective tax rate (%)</i>	<i>n.m.</i>	<b>25.0%</b>	
Net income <sup>*</sup>	1,012	<b>2,446</b>	141.7%
EPS (€) <sup>*</sup>	2.33	<b>5.63</b>	141.6%

## Comments

- Higher EBIT due to increased gross profit of LS and HC and non-recurring income in HC
- Profit before tax in line driven by EBIT increase and improved financial result
- Effective tax rate within guidance range of ~24-26%
- Increased net income and EPS reflects Consumer Health disposal gain

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

## Balance sheet – strong progress in deleveraging



- Increase in cash from Consumer Health disposal
- Decrease in intangible assets due to D&A (~-€1.2 bn) and divestments (~-€0.3 bn) mitigated by FX (~+€0.7 bn)

- Increase in equity reflects Consumer Health disposal gain (equity ratio of 46.7%)
- Cash proceeds partly used for further deleveraging

<sup>1</sup>Includes refund liabilities;  
Totals may not add up due to rounding

# Cash flow statement

## Q4 2018 – cash flow statement

[€m]	Q4 2017	Q4 2018	Δ
Profit after tax	1,015	<b>2,458</b>	1,443
D&A	511	<b>508</b>	-3
Changes in provisions	81	<b>80</b>	-1
Changes in other assets/liabilities	-1,155	<b>184</b>	1,339
Other operating activities	1	<b>-2,727</b>	-2,728
Changes in net working capital	189	<b>238</b>	50
Operating cash flow	642	<b>741</b>	99
Investing cash flow	-353	<b>2,822</b>	3,175
thereof Capex on PPE	-350	<b>-299</b>	51
Financing cash flow	-551	<b>-2,240</b>	-1,689

## Cash flow drivers

- Profit after tax driven by disposal gain (+ €2.2 bn) from Consumer Health, which is neutralized in other operating activities
- Changes in other assets/liabilities reflects last year neutralizing of non-cash relevant U.S. tax gain
- Changes in net working capital driven by trade accounts receivables in HC & LS
- Higher investing cash flow from Consumer Health disposal
- Financing cash flow reflects repayment of bank loans and commercial paper



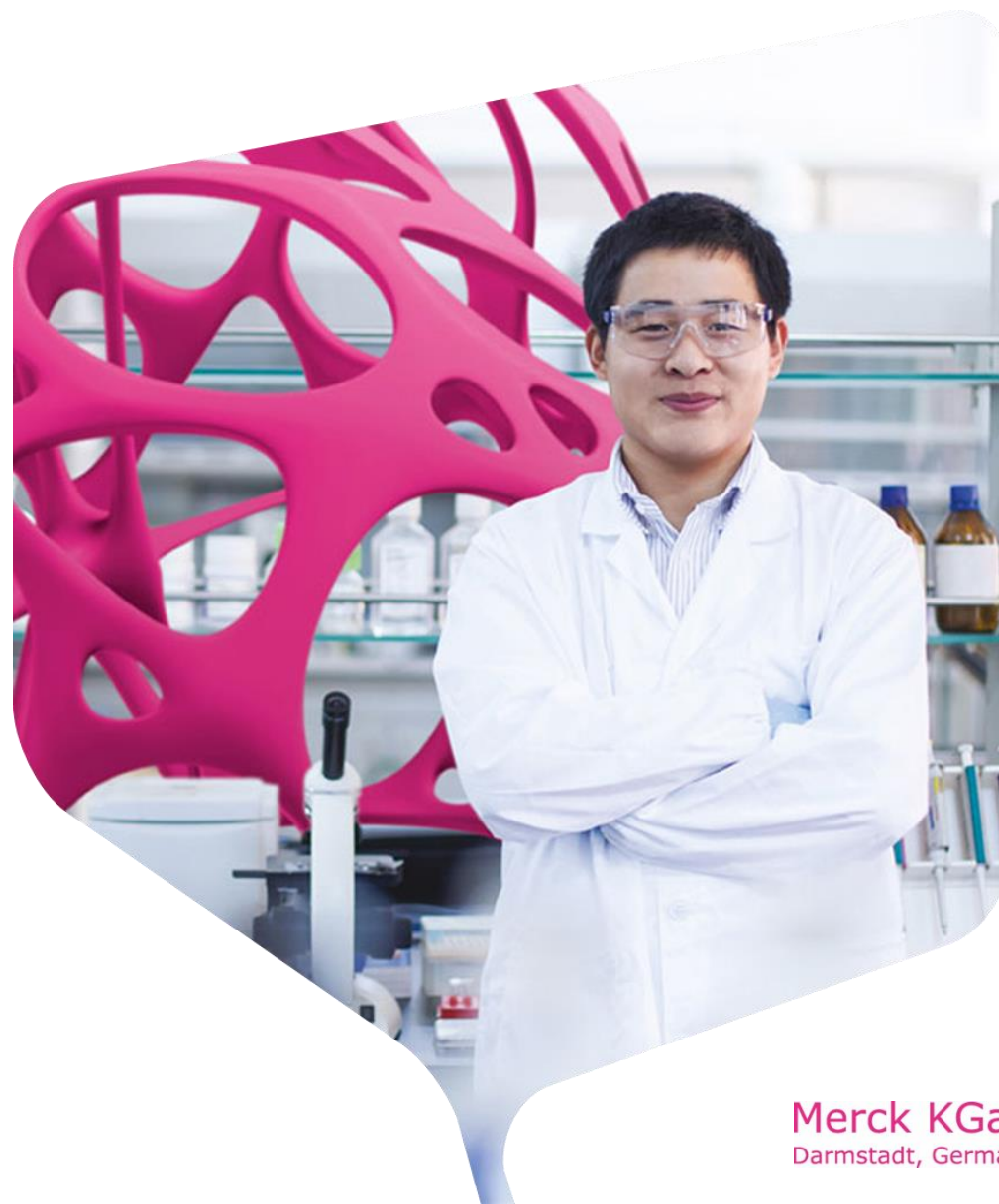
# Adjustments in Q4 2018

## Adjustments in EBIT

[€m]	Q4 2017		Q4 2018	
	Adjustments	thereof D&A	Adjustments	thereof D&A
Healthcare	73	33	23	11
Life Science	123	0	54	2
Performance Materials	34	19	28	20
Corporate & Other	43	4	34	0
Total	272	56	138	33

## Financial calendar

Date	Event
April 26, 2019	Annual General Meeting
May 14, 2019	Q1 2019 Earnings release
August 8, 2019	Q2 2019 Earnings release
November 14, 2019	Q3 2019 Earnings release



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