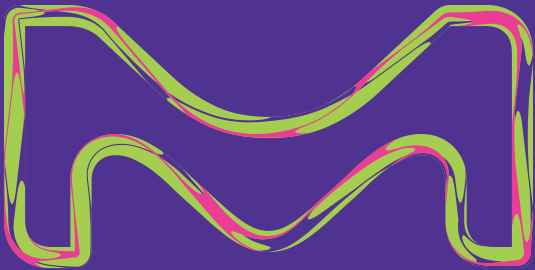




MERCK KGAA, DARMSTADT, GERMANY – EVERCORE ISI HEALTHCONX CONFERENCE

Udit Batra, CEO Life Science

Boston – November 29, 2018





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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

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

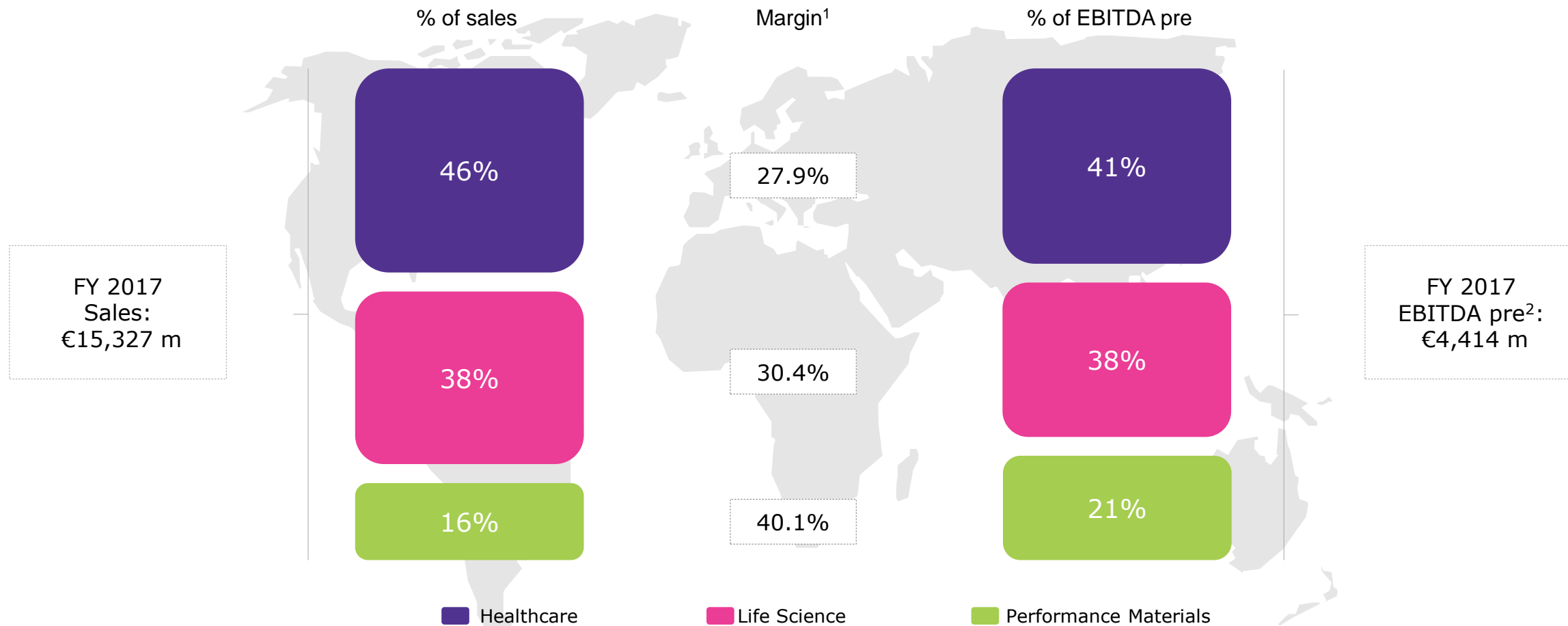


Leading Company in high-tech solutions

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

Group

Strong businesses with attractive margins

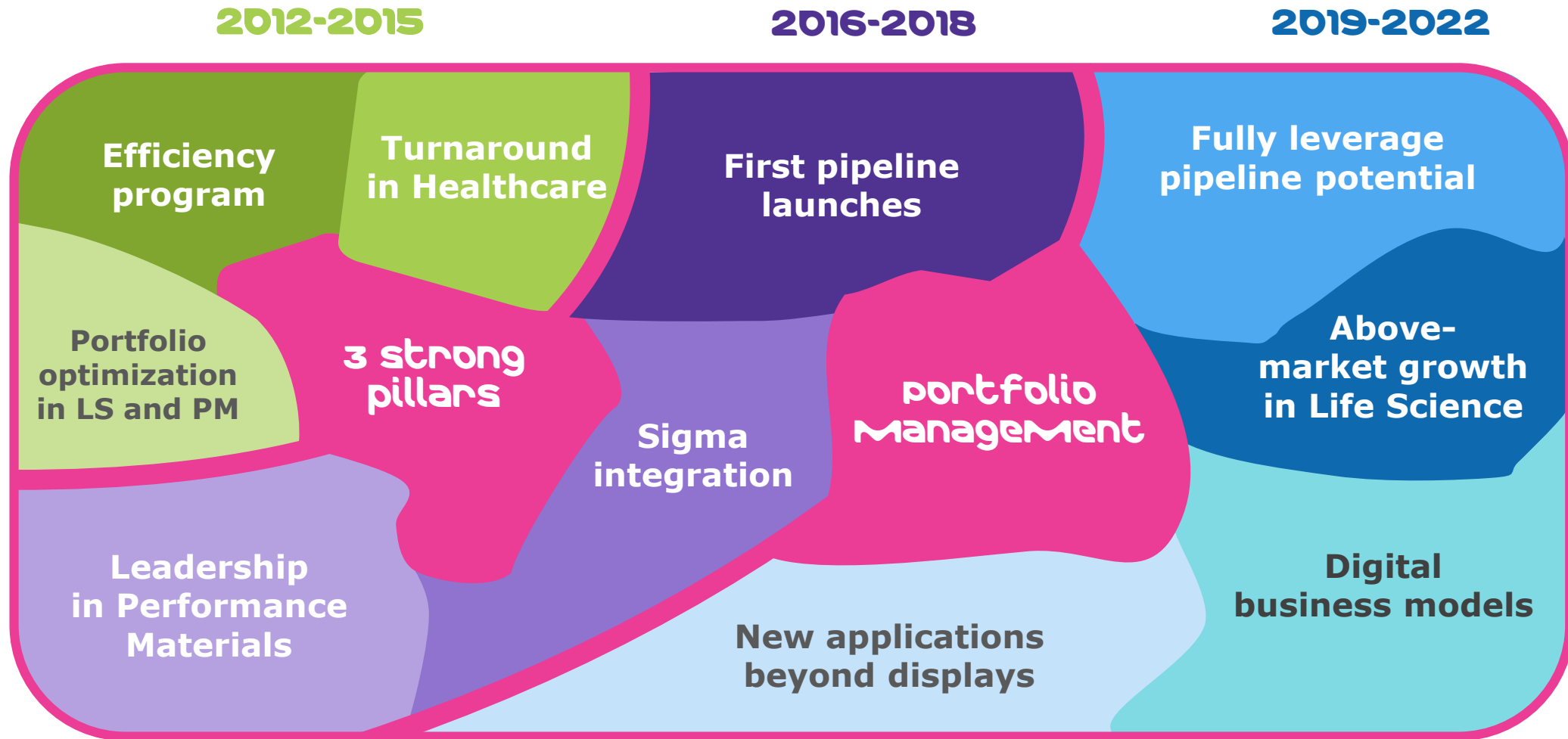


¹EBITDA pre margin in % of net sales; ²Including Corporate/Others (-€301 m)



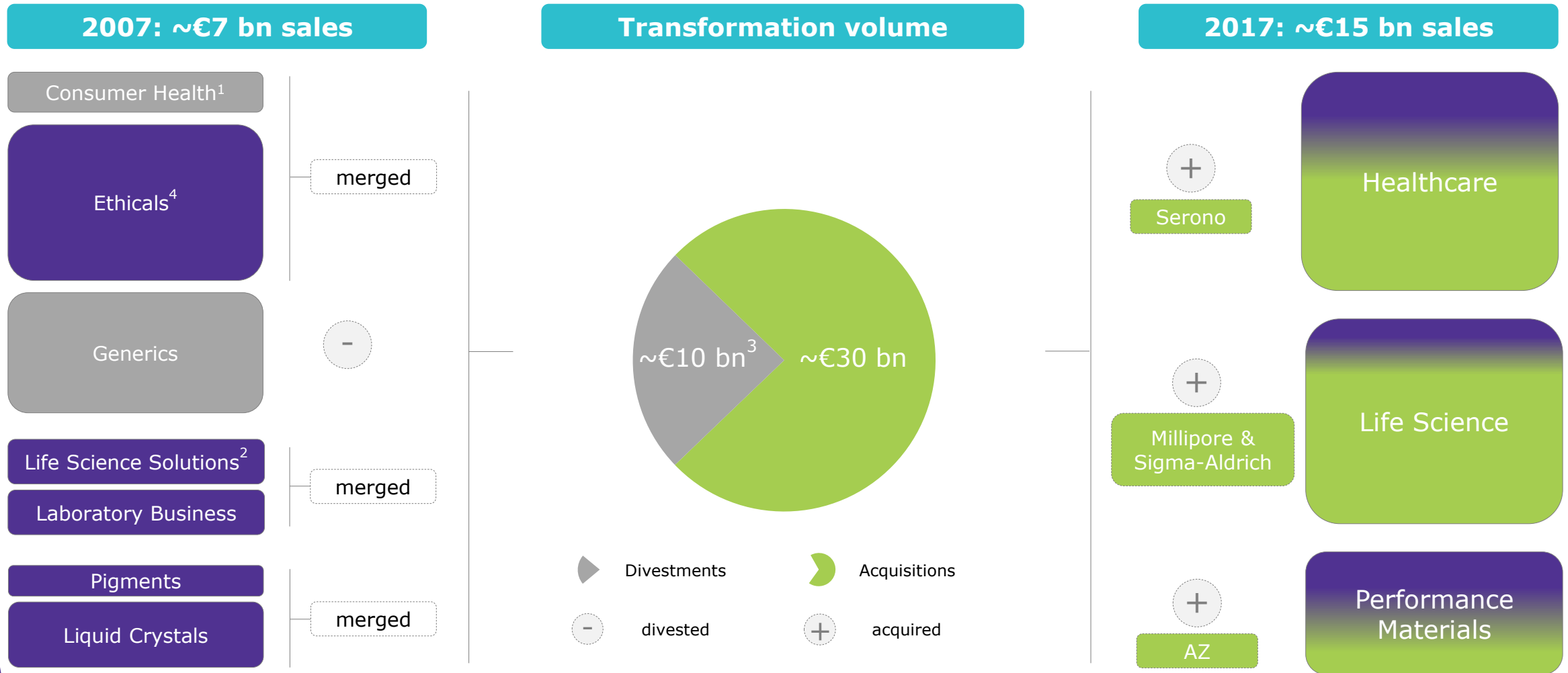
02 TRANSFORMING THE COMPANY

Group Strategic roadmap 2016-2022



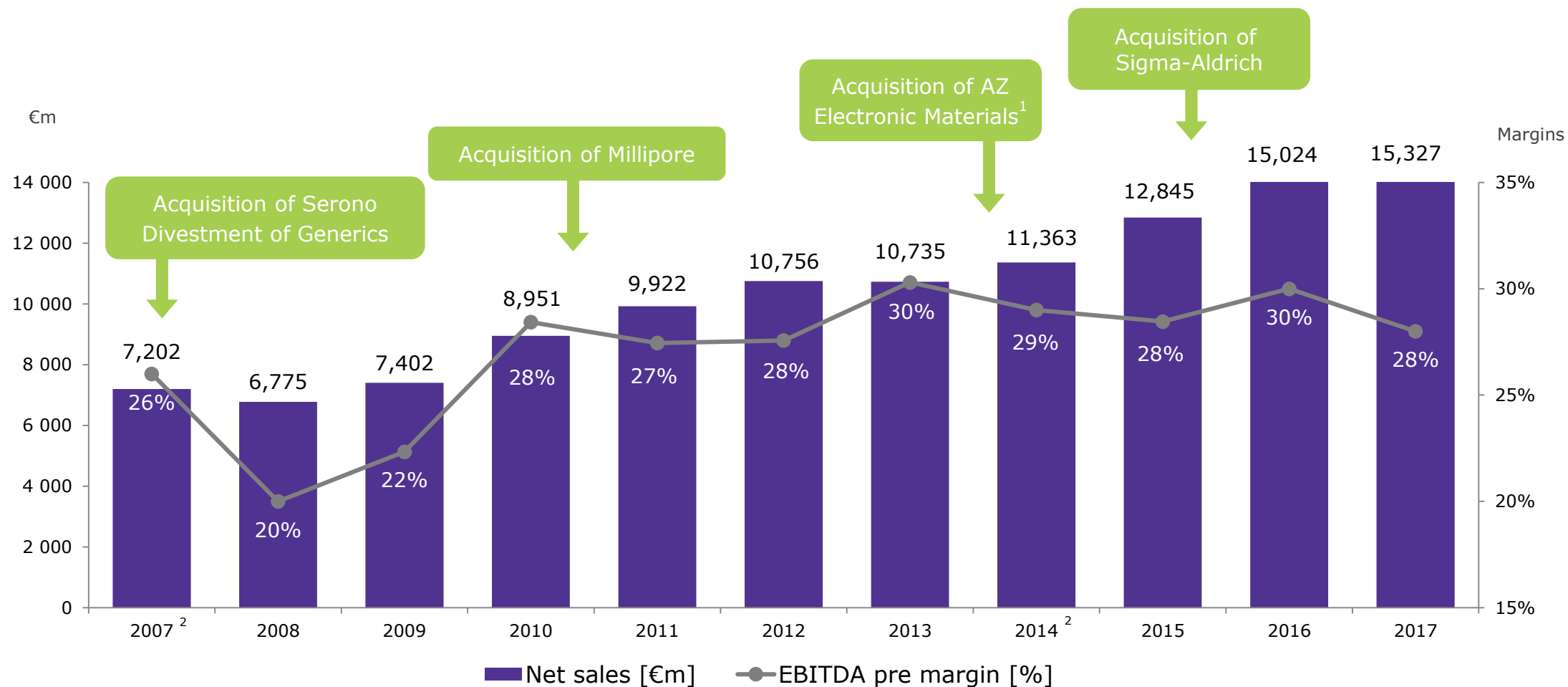
Group

We have added scale and strengthened the attractiveness of our portfolio



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

Group Profitability improved fundamentally



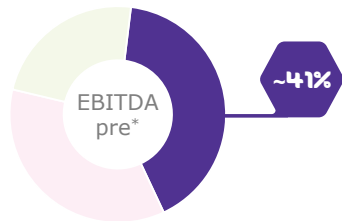
¹Included since 2 May 2014; ²2007 and 2014 EBITDA pre margin adjusted for comparability

Group

Clear set of priority goals to be realized by 2018



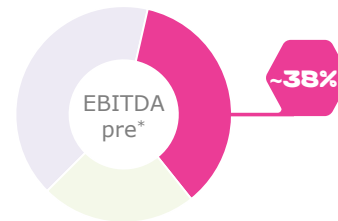
Healthcare



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



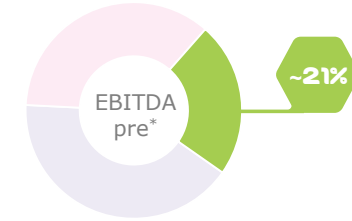
Life science



- 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

**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

Disciplined approach to portfolio management will persist



03 **HEALTHCARE**

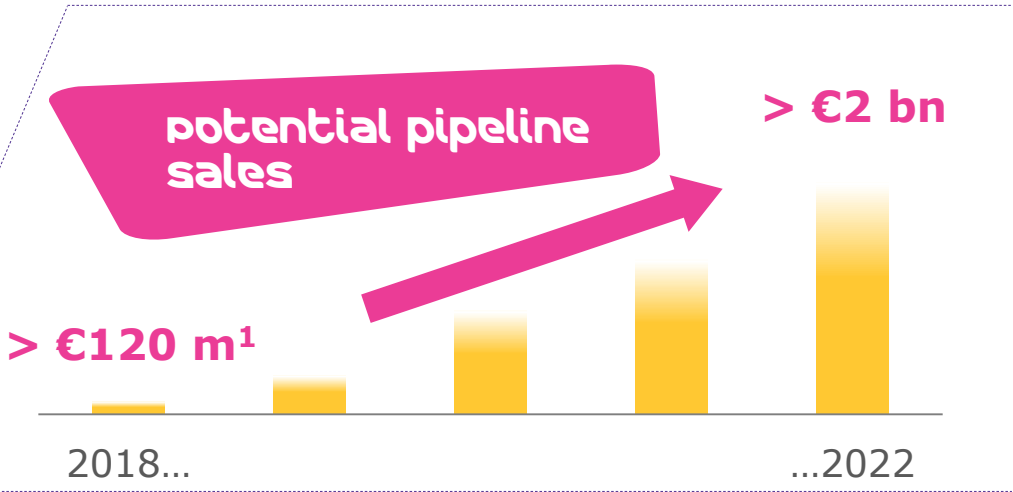
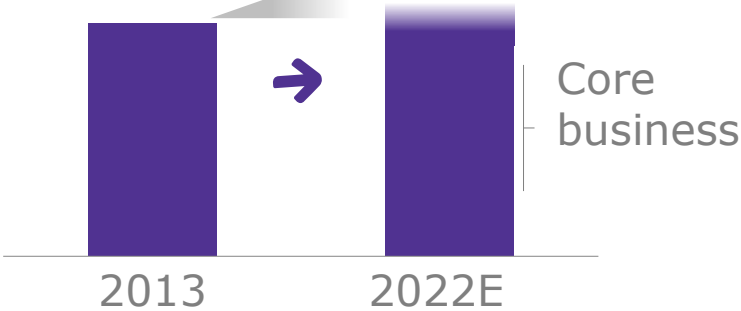
Funding for success

Healthcare

Healthcare is set to deliver on promising pipeline candidates

Focus on the pipeline

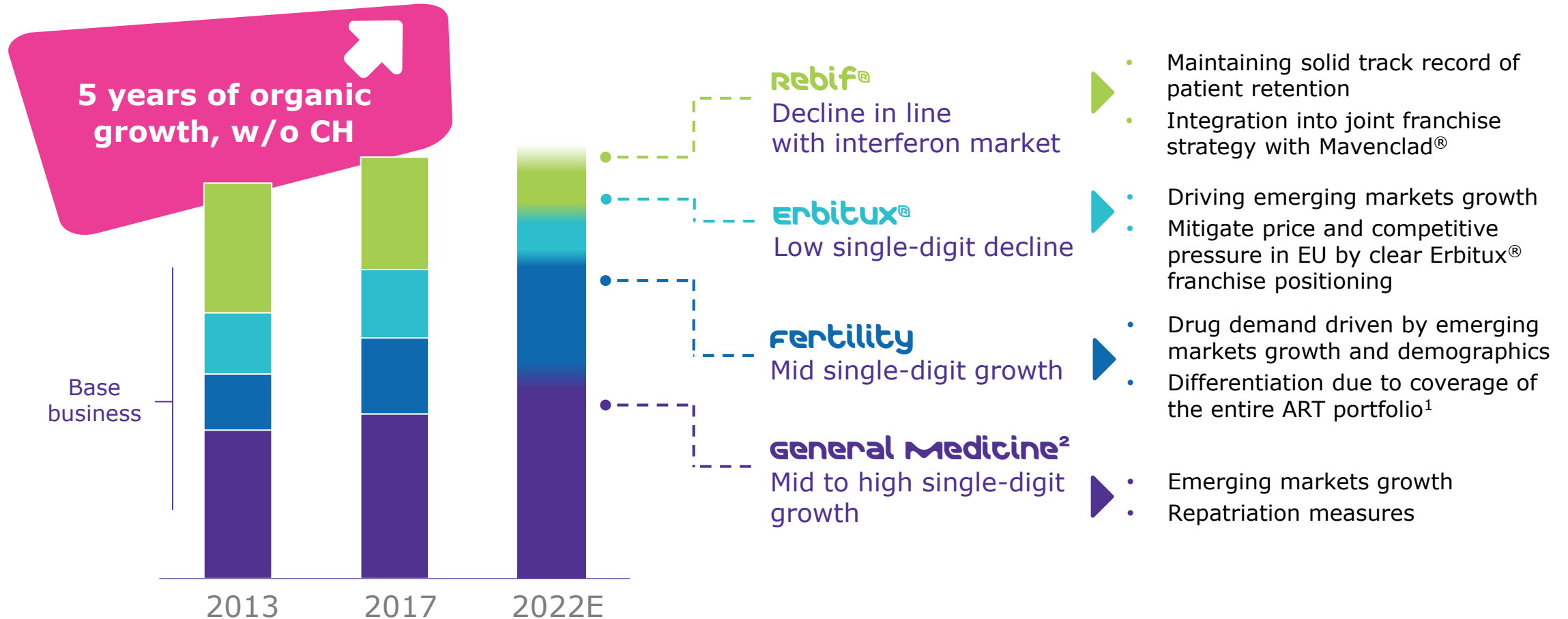
Deliver organic growth



Healthcare

Ambition to keep core business sales organically stable until 2022

Healthcare core business net sales until 2022

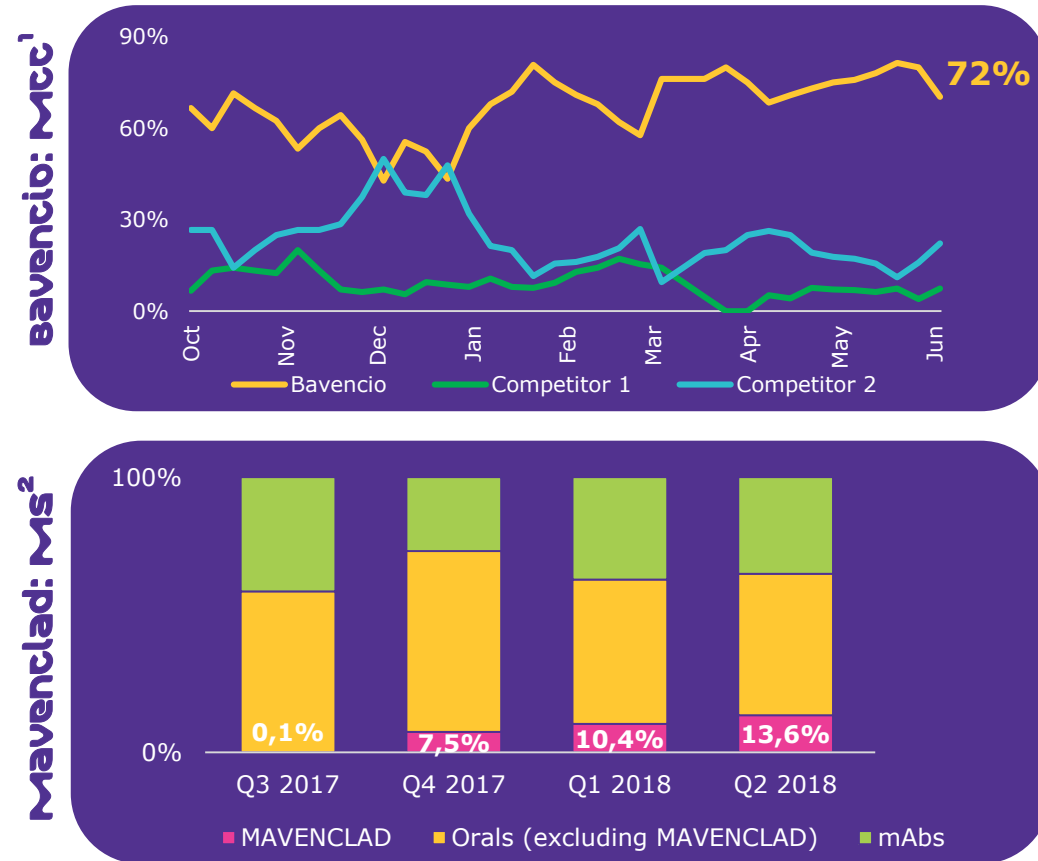


¹ART: Assisted Reproductive Technology; ²includes General Medicine, CardioMetabolic Care (CMC), Endocrinology & Allergopharma

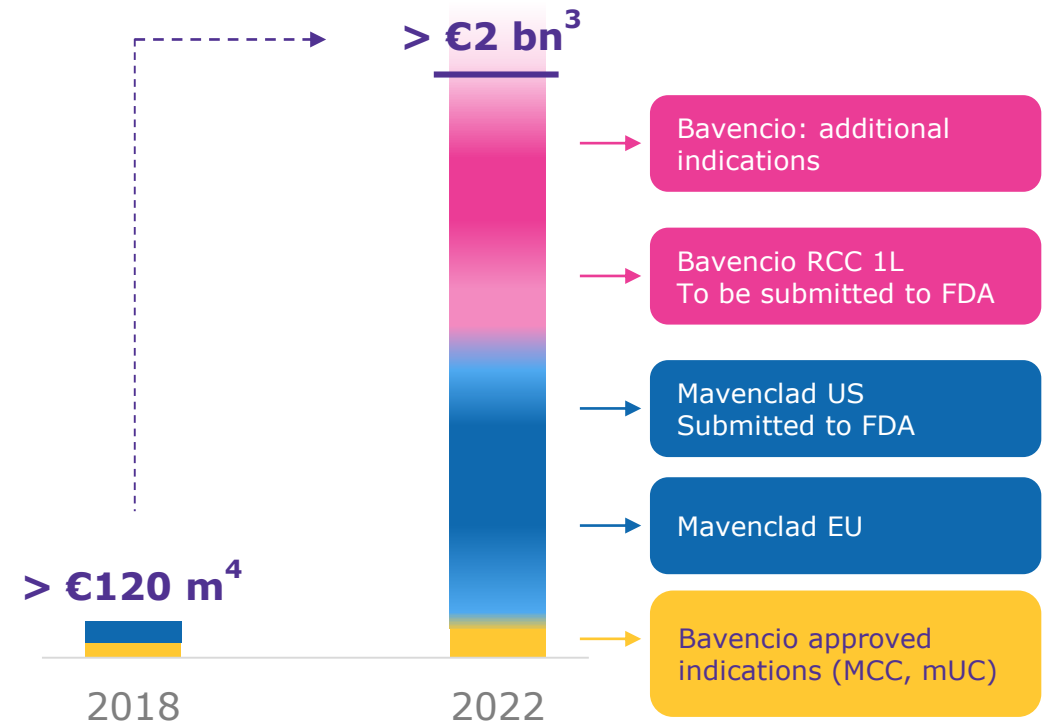
Healthcare

Mavenclad[®] and Bavencio[®] are growing well and support €2 bn pipeline target

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



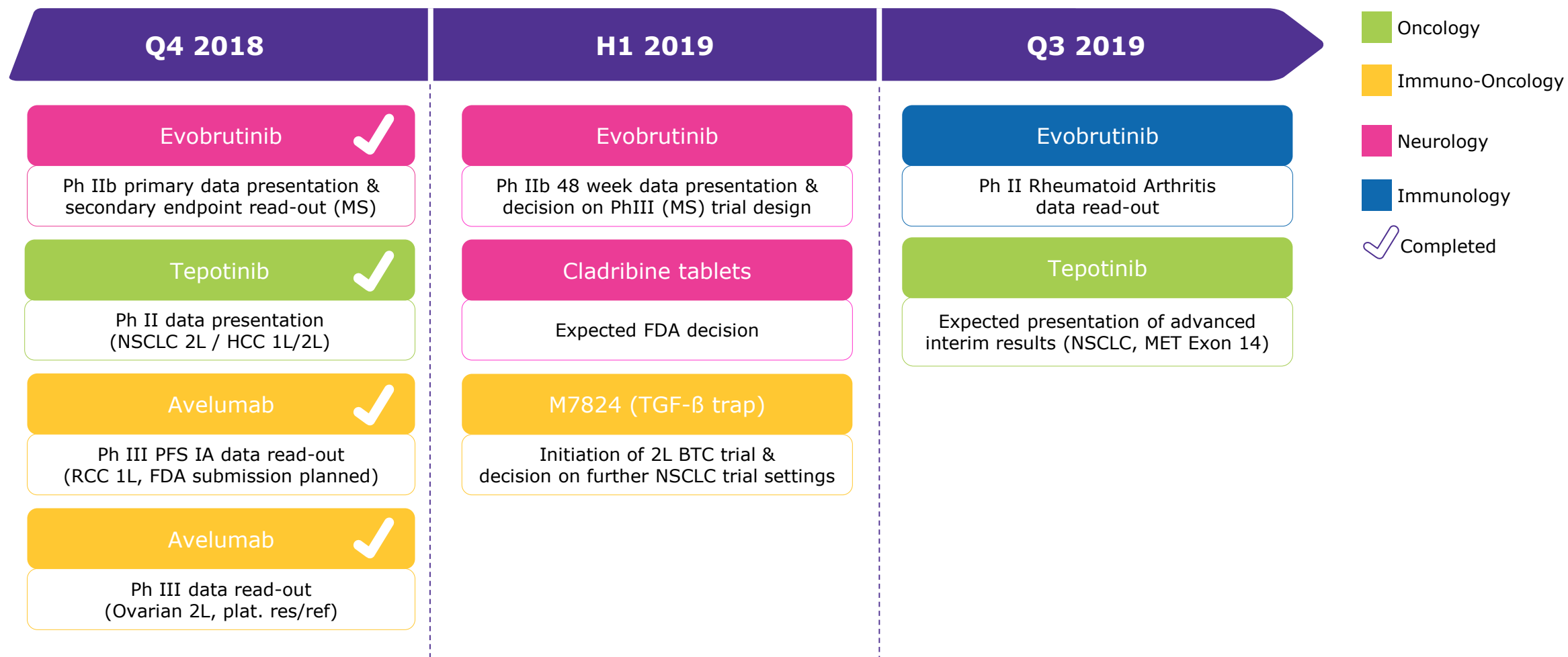
... and support €2 bn pipeline sales ambition for 2022



¹US: naïve/1L Patient share of IO class in 2018 - Data source: IMS claims data; ²Germany: 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; ³Indication, risk adjusted; composition is an illustration and may change subject to data read-outs and registration outcomes; ⁴Guidance 2018

Recent & upcoming catalysts

An eventful Q4 and a year of continued pipeline development ahead¹



¹Note: 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

Business is on track to deliver above-market organic growth

Life Science



Long-term growth drivers

- **Research activity:** >3,000 projects in research pipelines², rising number of experiments and newly emerging therapies/technologies backs healthy growth in biotech and CROs³
 - **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 production⁵ 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% today⁶
 - **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

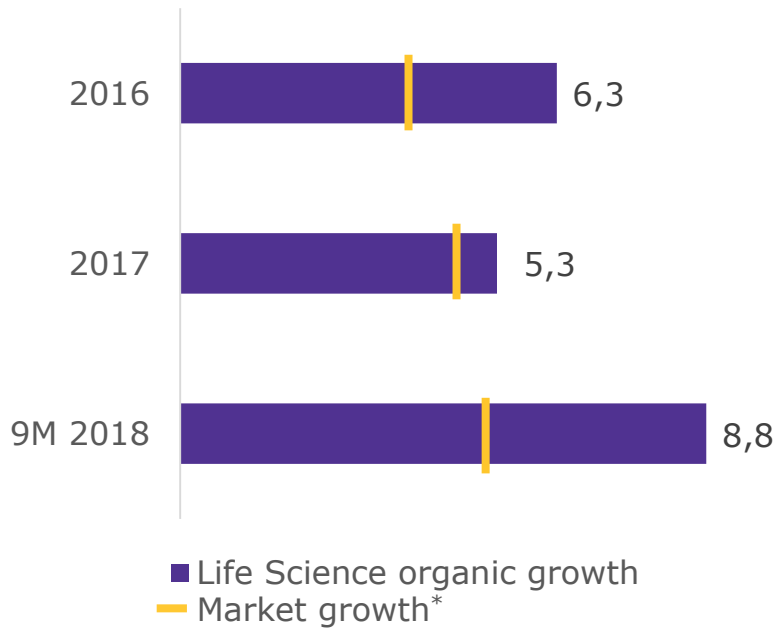
¹Source: Merck KGaA, Darmstadt, Germany Factbook; ²Source: PhRMA; ³CRO = Contract Research Organization; ⁴Indicative only; ⁵mAbs = monoclonal antibodies; ⁶Source: EvaluatePharma September 2018

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

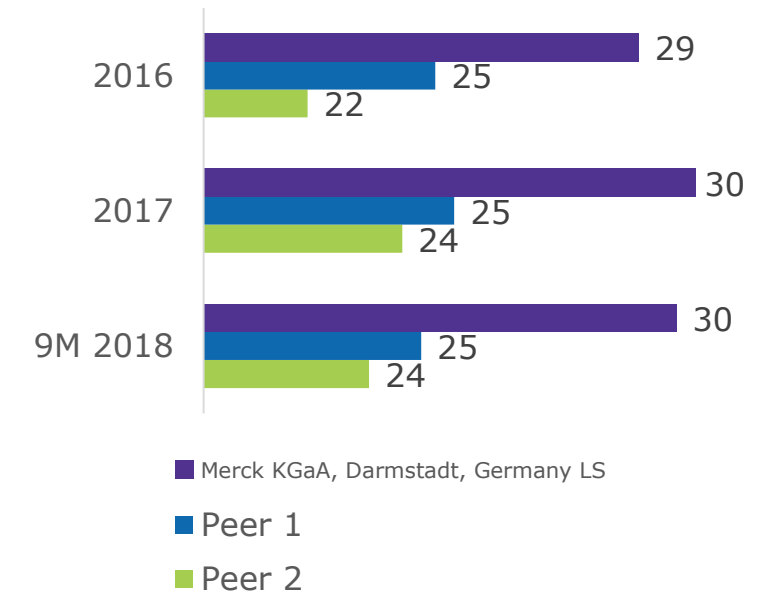
Life Science net sales [€m]



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 2015-2017*

Out-Performance

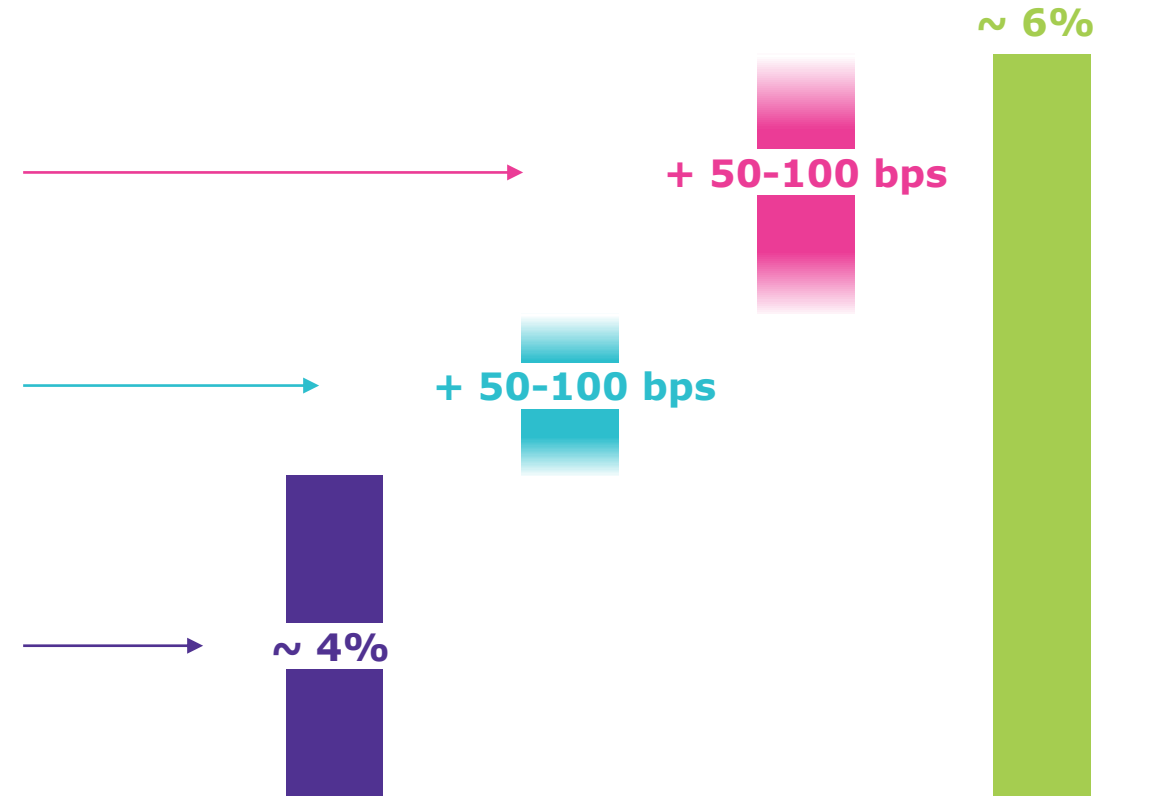
- We grow within the relevant market segments
- Broad range of differentiated products and services
- E-commerce platform

Portfolio advantage

- We focus 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



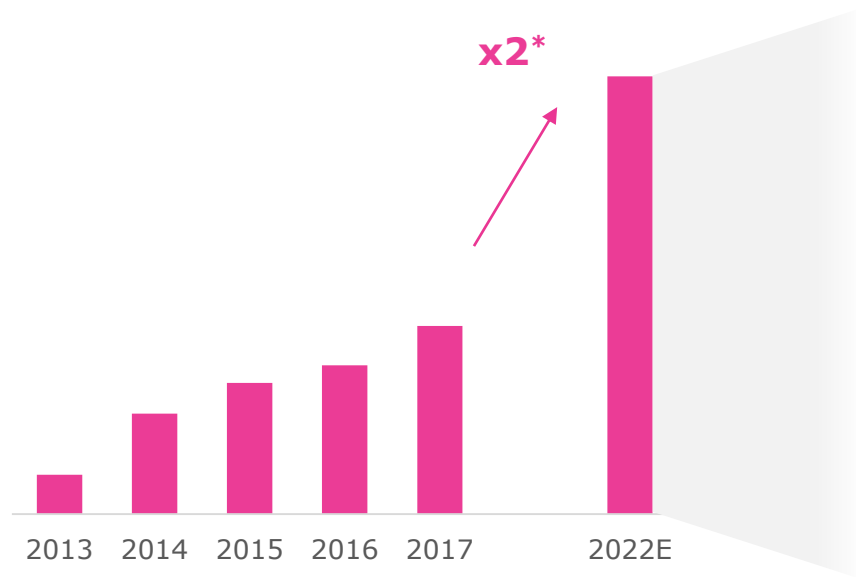
*Indication

Life Science

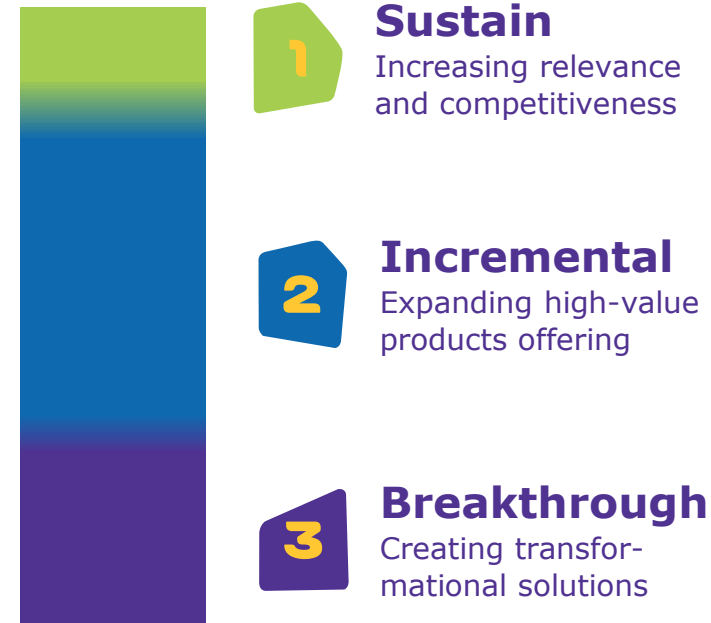
Innovation underpins Life Science's position as growth engine for us

Products launched after 2013

% of total net sales



Categories of innovation



Industry trends

Customer requirements, scientific standards and therapies are evolving continuously

Merck KGaA, Darmstadt, Germany's strong and innovative portfolio ensures well-balanced strategic growth

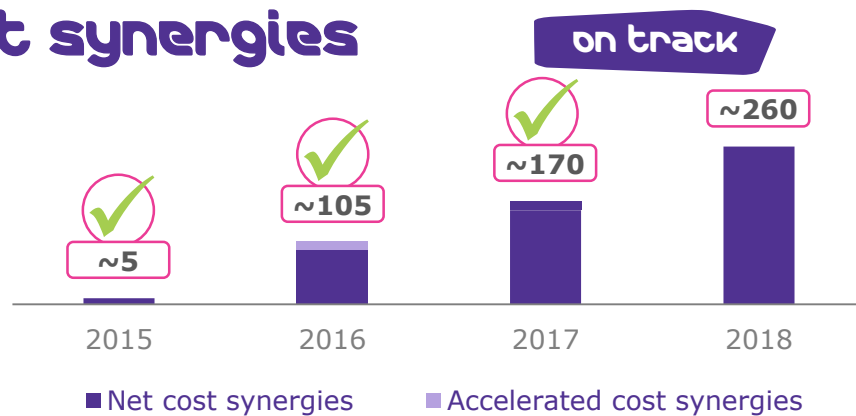
Innovation pipeline is key to differentiate in the market in order to sustain Life Science's above-market growth trajectory

*Indication

Integration of Sigma and synergy generation progressing well

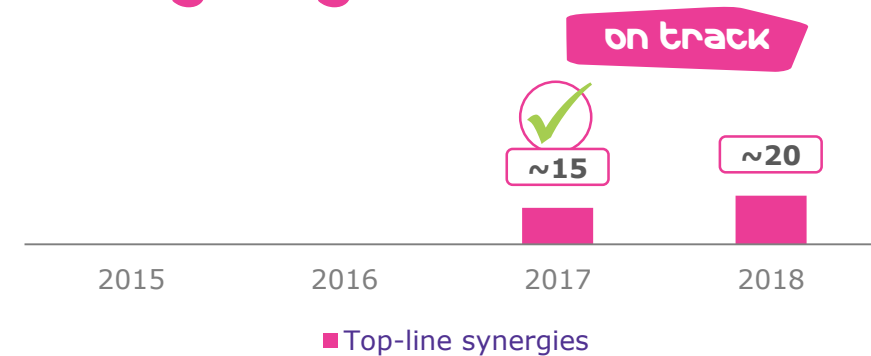
on track to deliver planned synergies of ~ €280 M until 2018

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**



05

PERFORMANCE MATERIALS

Maintaining leadership and innovation

Performance Materials

A leader in the electronic materials market

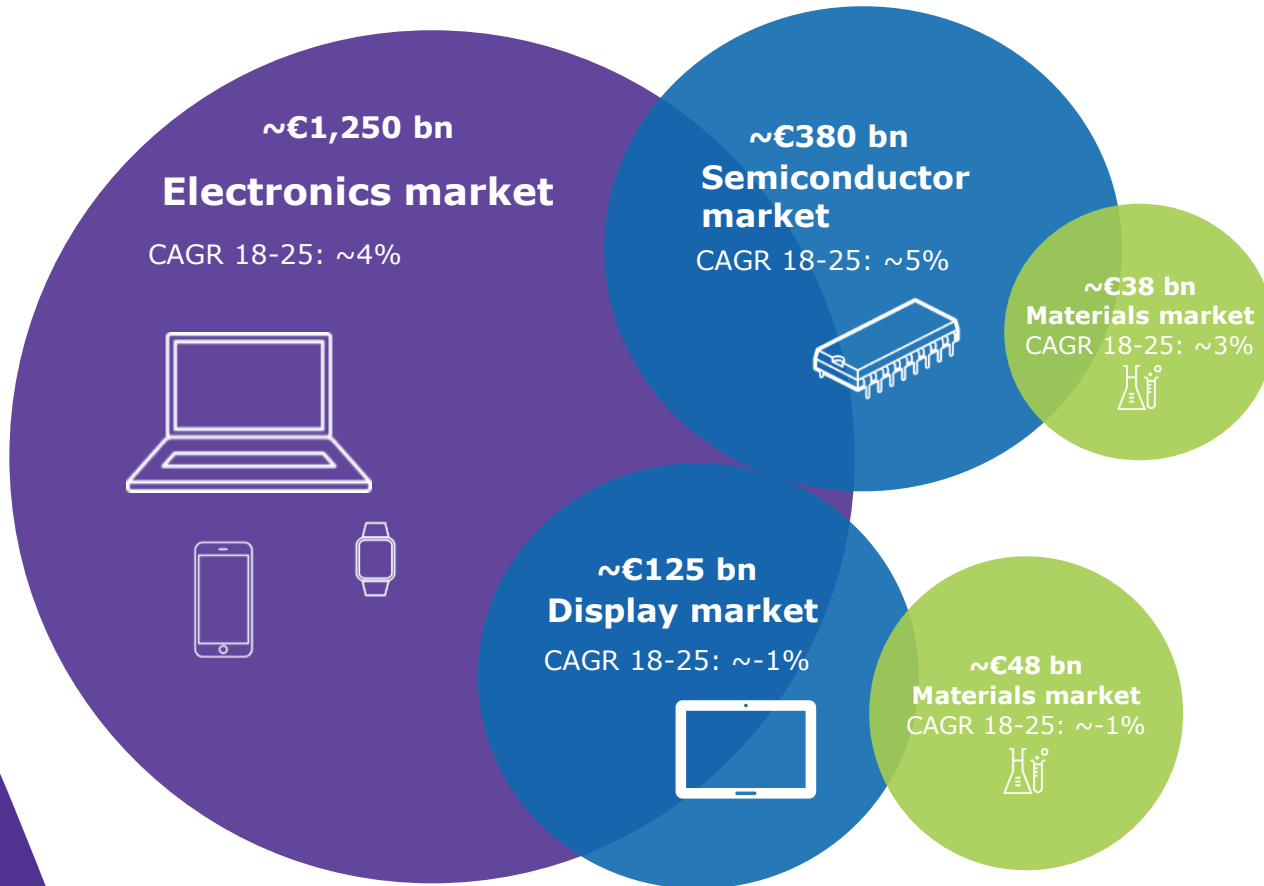
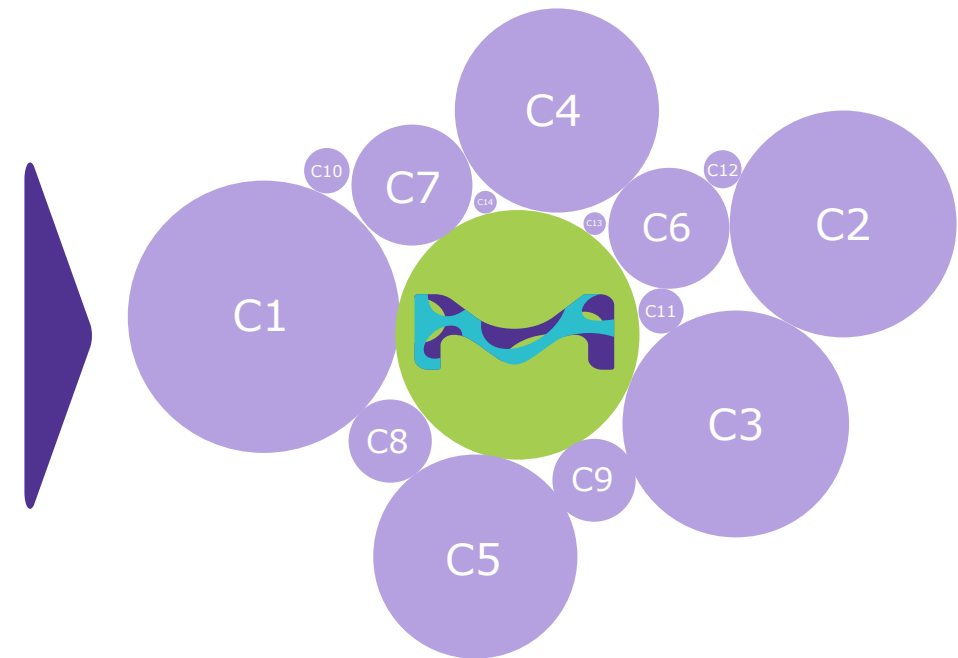


Illustration of the electronics market and thereof its selected sub markets

Electronic materials competitor landscape¹

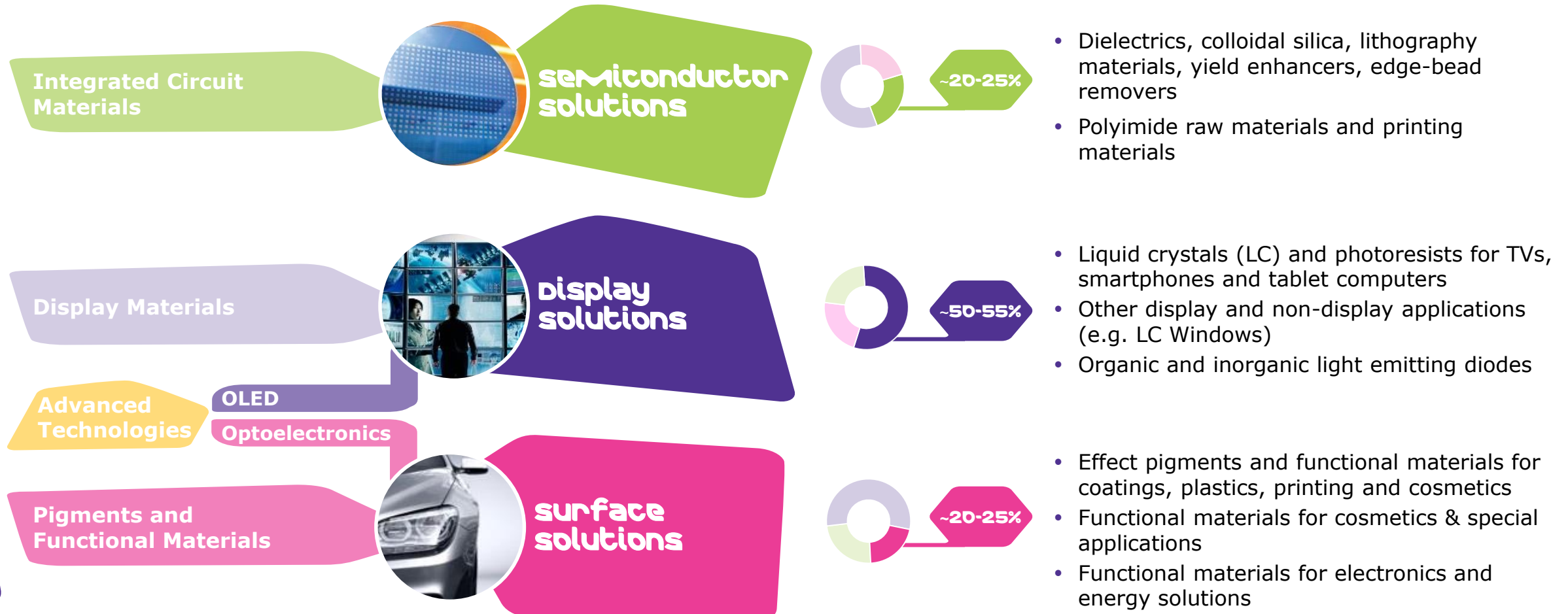


¹Bubble size in competitive landscape illustrates share of semiconductor and display material sales of indicated competitors (C1 – C14)

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

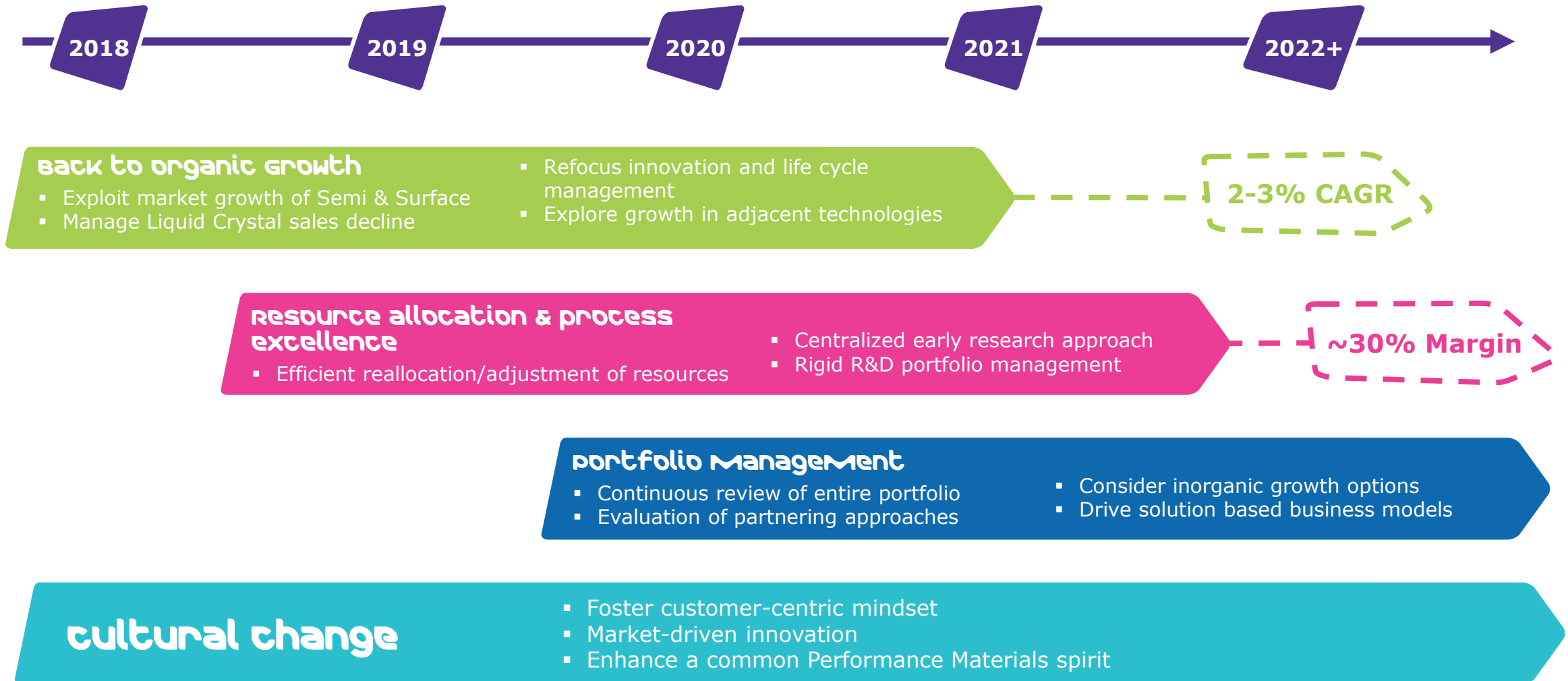
Performance Materials: New structure combines LC with OLED, serving same customer group

Business allocation within Performance Materials

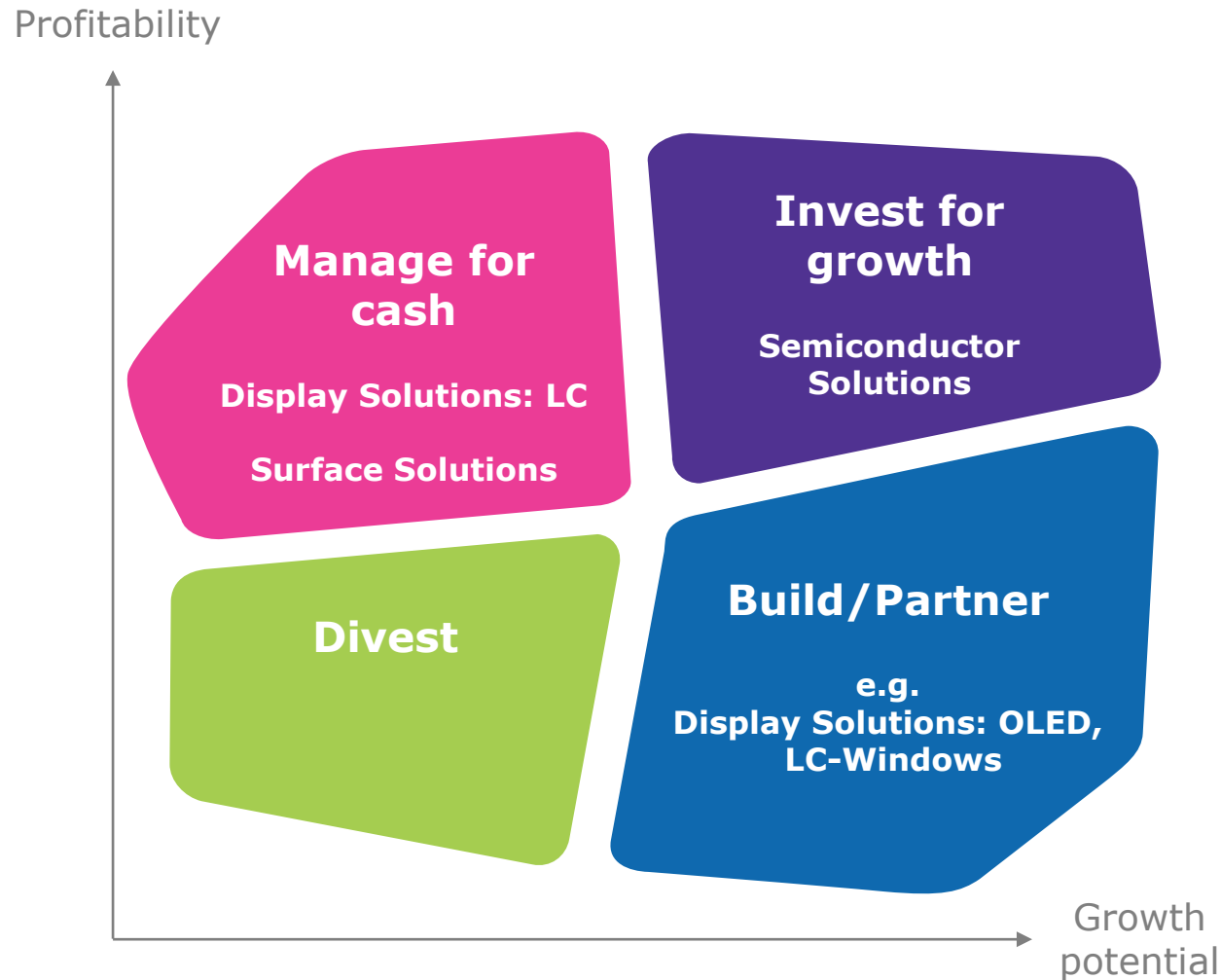


"Bright Future"

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

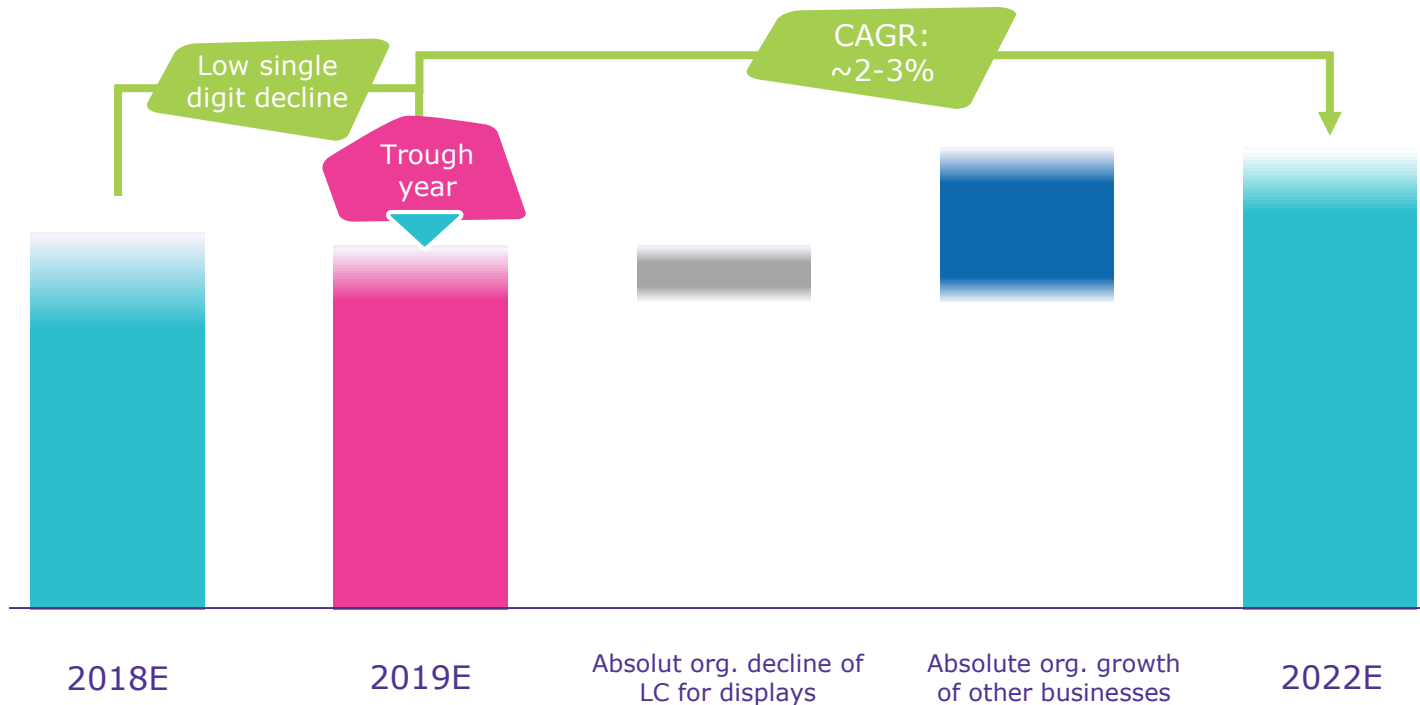
- Early industry cycles with strong potential
- Strictly prioritize and diversify risk

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



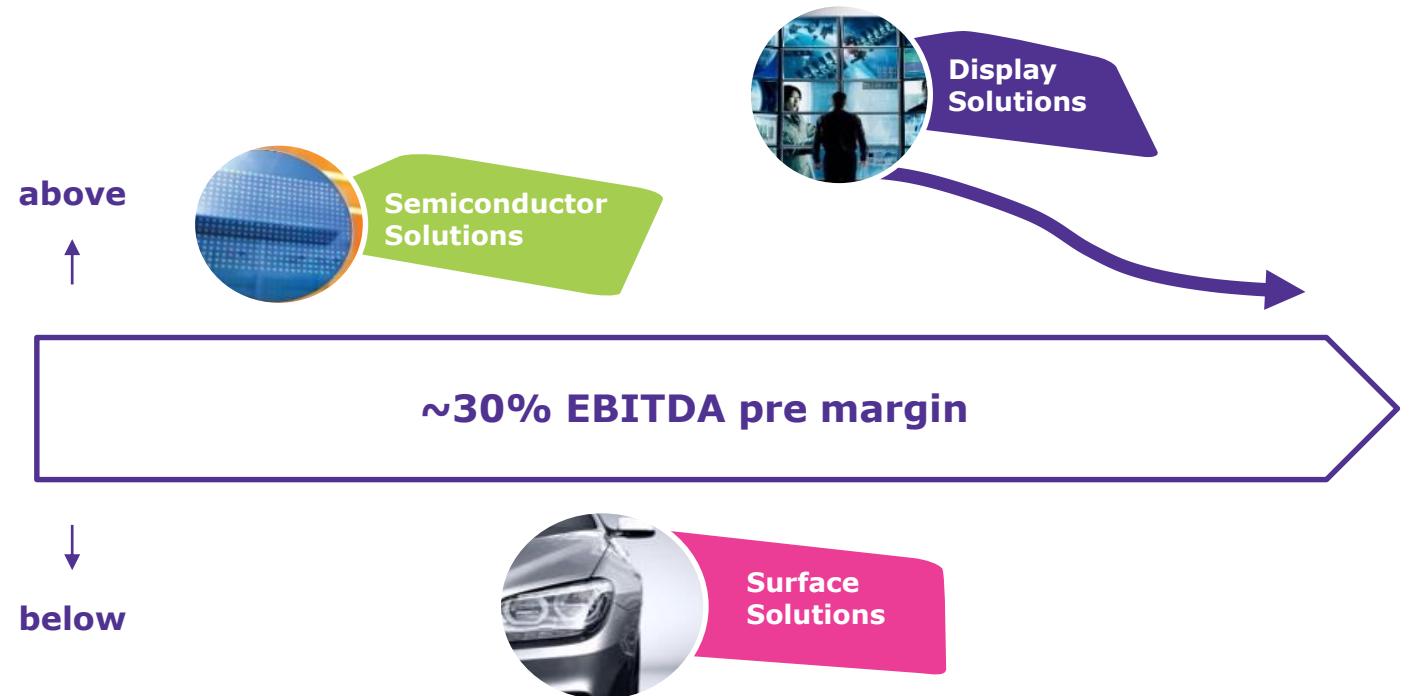
After 2019 sales growth of Semiconductor & Surface Solutions, OLED and Photoresists will overcompensate the decline of Liquid Crystals for displays

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

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:

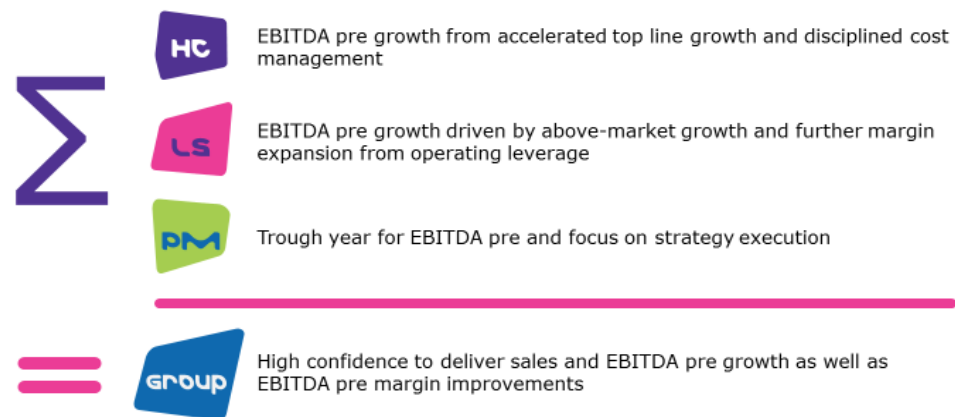
~ € 5.00 – 5.30

Group on a growing and profitable trajectory

2019 Group EBITDA pre increase confirmed

2019		2018
Sales	>	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*



Healthcare

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)



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

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	Q4/2018 – FY 2019 hedge ratio ~60% at EUR/USD ~1.20
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

Near-term financial priorities will secure Merck KGaA, Darmstadt, Germany's profitable growth path

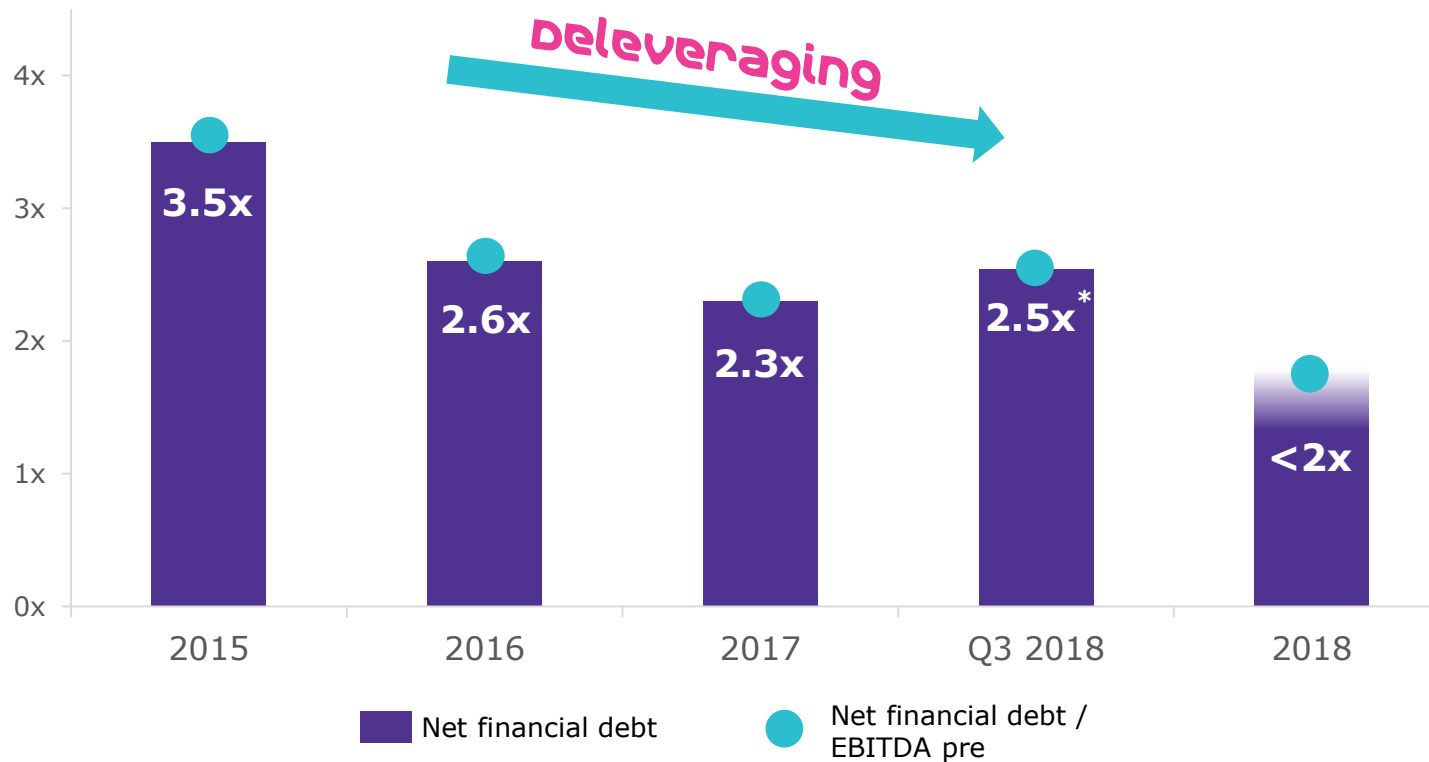
- **Strong cash flow** will be used to drive down gearing to <2x net debt / EBITDA pre in 2018
- **Larger acquisitions (>€500 m) ruled out** for 2018 (or financed by divestments)
- **Dividend policy** that ensures a sustainable and resilient development
- **Synergy generation** is utmost priority
- **Cost 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

Group

Strong focus on cash generation to ensure swift deleveraging

Net financial debt¹ 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

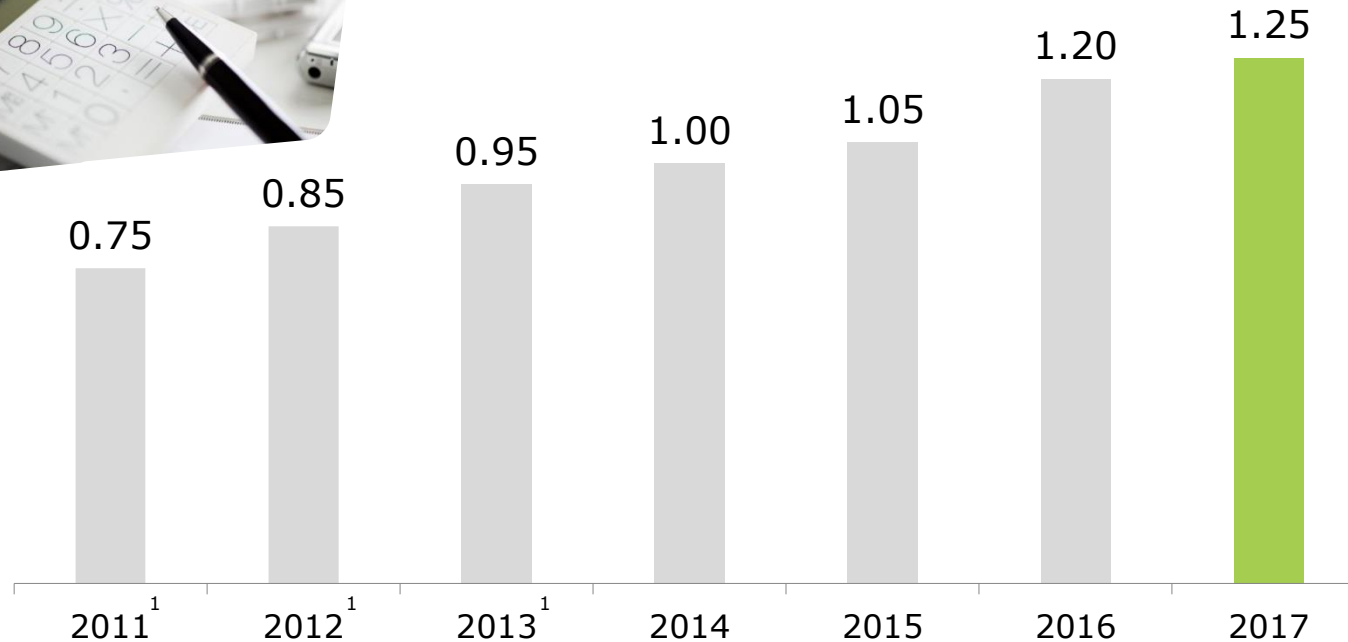
¹Net financial debt (without pensions);

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

Group

Dividend growth sustained

Dividend¹ 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 yield² of 1.4%

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

Healthcare Strategy

The Healthcare Pipeline continues to deliver

November 20, 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 1L¹

avelumab
anti-PD-L1 mAb
Solid tumors²

avelumab
anti-PD-L1 mAb
Non-small cell lung cancer²

avelumab
anti-PD-L1 mAb
Urothelial cancer²

abrituzumab³
pan-αv integrin inhibiting mAb
Colorectal cancer 1L¹

M7824
anti-PD-L1/TGFBeta trap
Non-small cell lung cancer 1L¹

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)⁴
anti-IL-17 A/F nanobody
Psoriasis

evobrutinib
BTK inhibitor
Multiple sclerosis

Phase III

avelumab - anti-PD-L1 mAb
Non-small cell lung cancer 1L¹

avelumab - anti-PD-L1 mAb
Gastric cancer 1L-M^{1M}

avelumab - anti-PD-L1 mAb
Ovarian cancer 1L¹ and 1L-M^{1M}

avelumab - anti-PD-L1 mAb
Ovarian cancer 1L^{1,5}

avelumab - anti-PD-L1 mAb
Urothelial cancer 1L-M^{1M}

avelumab - anti-PD-L1 mAb
Renal cell cancer 1L¹

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

Registration

cladribine tablets
lymphocyte-targeting agent
Relapsing multiple sclerosis⁶

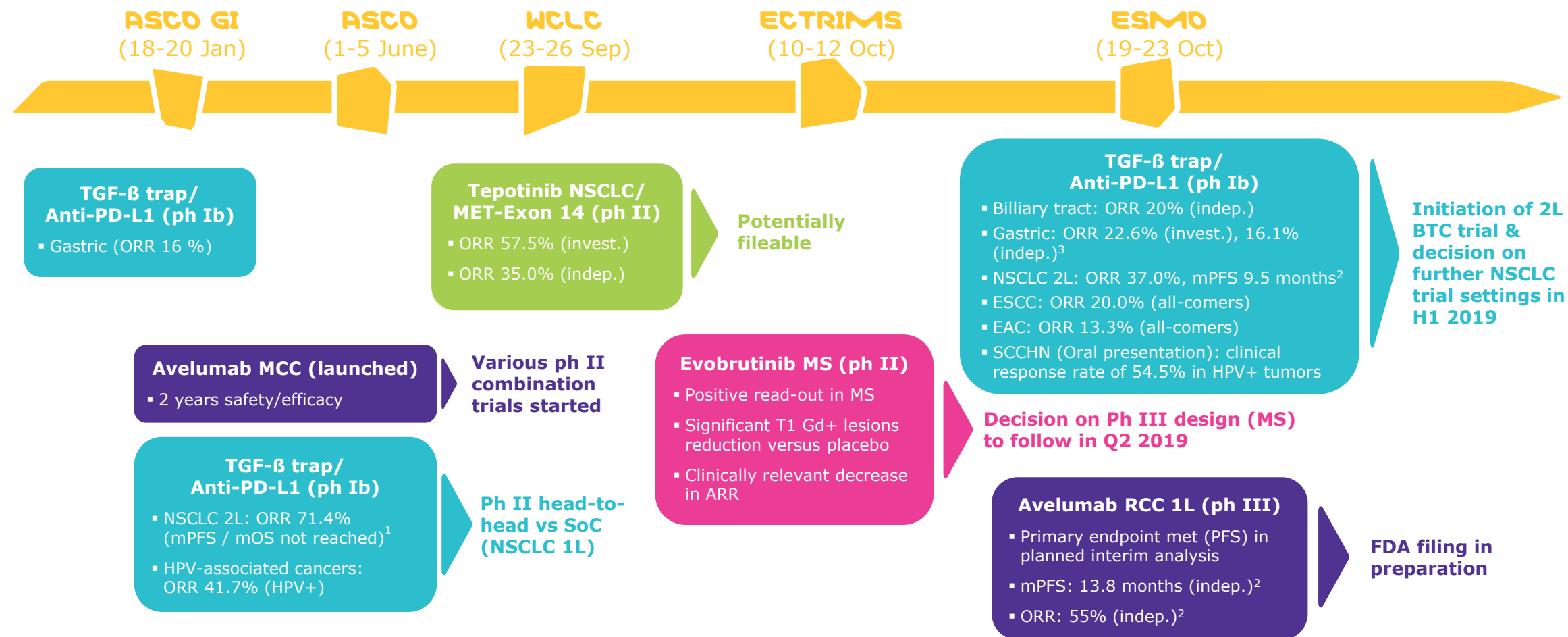
- Oncology
- Immuno-Oncology
- Immunology
- Neurology
- Global Health

¹ First-line treatment; ^{1M} First-line maintenance treatment. ² Avelumab combination studies with talazoparib, axitinib, ALK inhibitors, chemotherapy, or novel immunotherapies. ³ 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. ⁴ 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. ⁵ Avelumab in combination with talazoparib. ⁶ 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



¹PD-L1 high; ²PD-L1 ≥ 1%; ³Update 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

Oncology Strategy

Strategy anchored on five foundational pillars

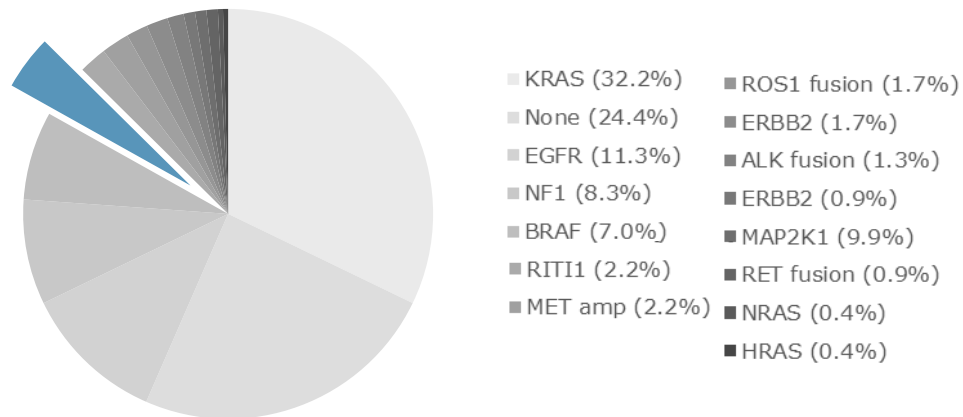
1	Targeted Oncology	<ol style="list-style-type: none"> 1. Erbitux: continued leadership in CRC and SCCHN 2. Tepotinib: c-met driven cancers 	<ol style="list-style-type: none"> 1. Numerous Erbitux ISTs incl. combination with Avelumab 2. Tepotinib in NSCLC, HCC
2	Avelumab	<ol style="list-style-type: none"> 1. Monotherapy as a basis for combinations 2. Establish immunogenic priming in combination or sequence with CT/RT¹ 3. Novel combinations 4. Establish value of unique molecular characteristics (ADCC) 	<ol style="list-style-type: none"> 1. NSCLC 1L (high intensity) 2. Maintenance in UC 1L, gastric 1L, ovarian 1L 3. Avelumab + Inlyta (RCC 1L) 4. Unique combinations leveraging ADCC
3	IO bi-functionals	Engineer or access platforms where biology is best addressed by a bi-functional approach	<ul style="list-style-type: none"> • TGF-beta trap/anti-PD-L1 • Anti-LAG-3/anti-PD-L1 • NHS-IL 12
4	DNA Damage Response inhibitors	Establish leadership in DDR and leverage synergies across portfolio (immuno-oncology plus emerging platforms)	<ul style="list-style-type: none"> • DNA-PK-i • ATR-i • ATM-i
5	Emerging Platforms	Invest in complementary technologies within focus discovery areas	<ul style="list-style-type: none"> • Antibody-Drug-Conjugates (ADC, e.g. partnership with Mersana/Sutro)

Tepotinib: Highly selective c-met inhibitor

Currently no approved therapy targeting METex14 and/or c-met amplification

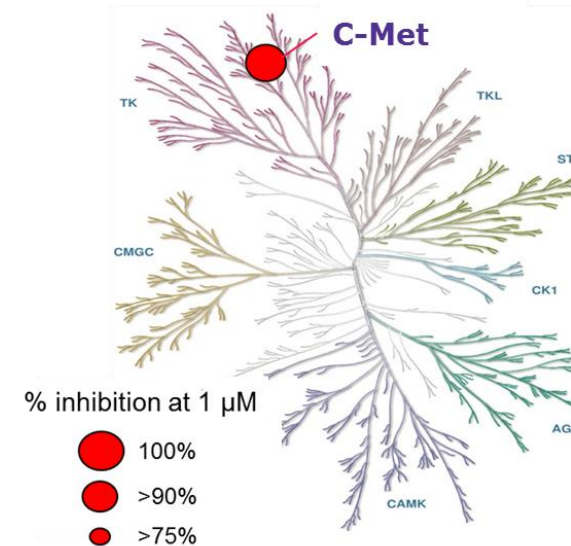
Oncogenic drivers in lung adenocarcinoma¹

- MET-mutations are clinically **unique molecular subtypes** of NSCLC
- MET exon 14 alteration confer oncogene addiction in **~3-4 % of NSCLC**
- **No approved therapy** specifically targeting METex14 and/or c-Met amplification



Selectivity Profile²

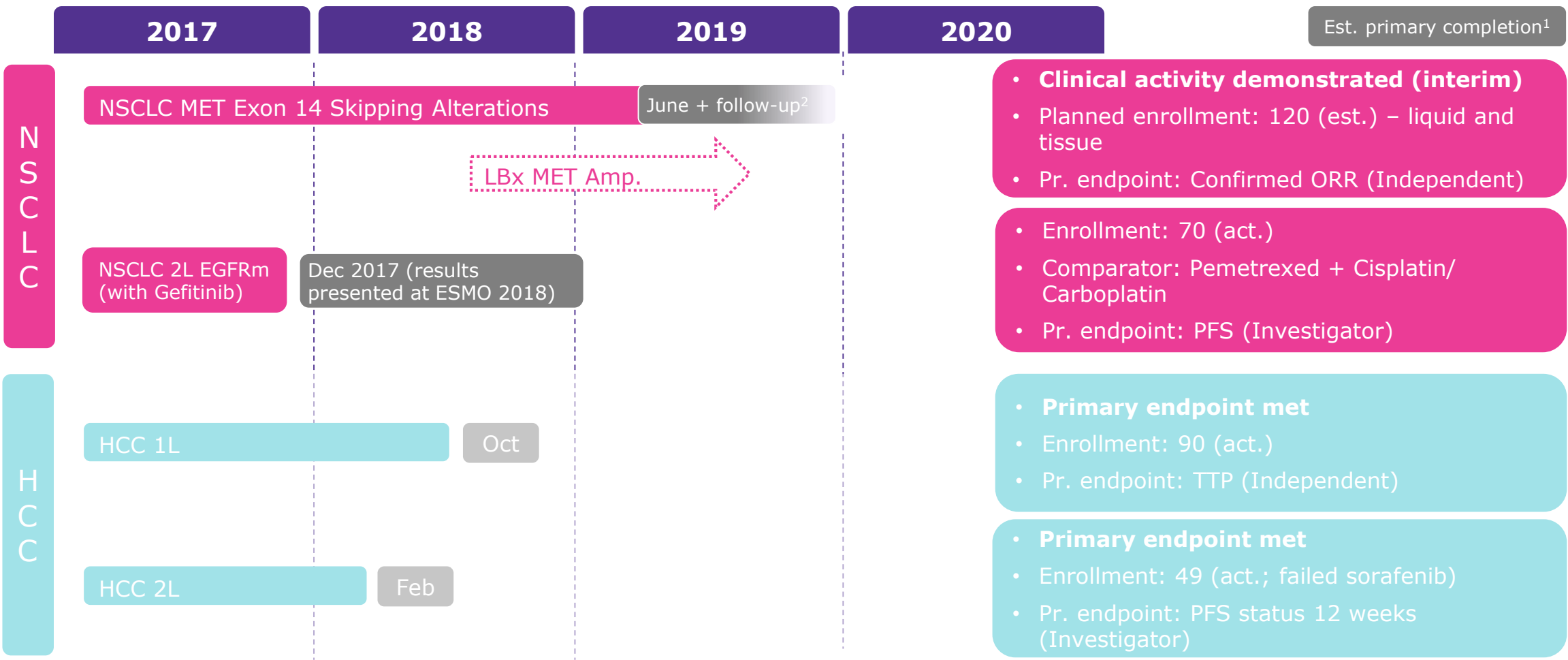
- ATP competitive, **reversible small molecule** c-Met inhibitor³
- **Highly selective** according to preclinical benchmarking²
 - In panel of >240 kinases, only c-Met inhibited at 1 μ M
 - >90% inhibition of phospho-c-Met levels (tumor biopsy)



¹ Cancer Genome Atlas Nature 2014;511:543-50; ² Merck KGaA, Darmstadt, Germany data on file; ³ Blatt et al, 2013

Tepotinib: Program overview

Development focus on biomarker enriched patient populations



Tepotinib: Interim Phase II results

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

VISION

Study Design¹

- 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^{1,2}

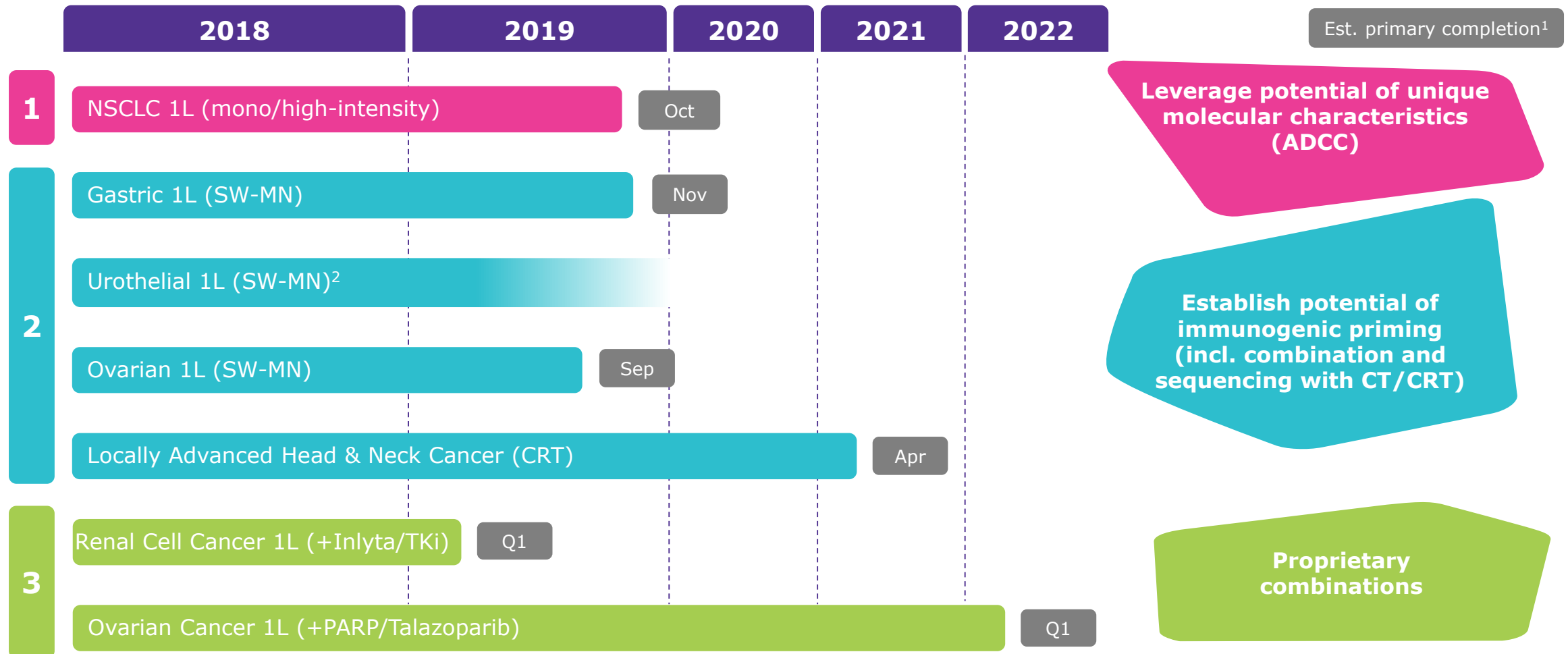
- Encouraging signs of activity**
- ORR to date** based on independent review (35.0%) and investigator assessment (57.5% incl. two CR)
- Median duration of response** based on investigator assessment is 14.3 months (95% CI: 3.7, nd)
- Safety:** well tolerated, most common side effects were peripheral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

Tepotinib 500 mg ²	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)

¹ 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; ² 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, more than 15 tumor types



¹ Estimated primary completion date according to Clinicaltrials.gov as of October 26, 2018; timelines are event-driven and may be subject to change; ² 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

Avelumab: Renal Cell Carcinoma 1L

Alliance will pursue US regulatory submission following positive Interim Analysis (PFS)

Study Design¹

- **Study:** PhIII JAVELIN Renal 101
- **Patient population:** 886 patients with advanced RCC across all risk groups, 63% PD-L1+
- **Comparator:** BAVENCIO (avelumab) + INLYTA (axitinib) vs SUTENT (sunitinib) as 1L therapy
- **Breakthrough Therapy Designation** granted by the FDA in December 2017

Interim Analysis¹ results presented at ESMO 2018

Primary endpoints (PFS and OS in patients with PD-L1+ tumors):

- mPFS Avelumab + Axitinib: 13.8 months
- mPFS Sunitinib: 7.2 months

Key secondary endpoints (PFS and OS in overall population):

- mPFS Avelumab + Axitinib: 13.8 months
- mPFS Sunitinib: 8.4 months

Confirmed Objective Response Rate:

- ORR Avelumab + Axitinib: 55.2%
- ORR Sunitinib: 25.5%

Safety profile: favourable safety profile

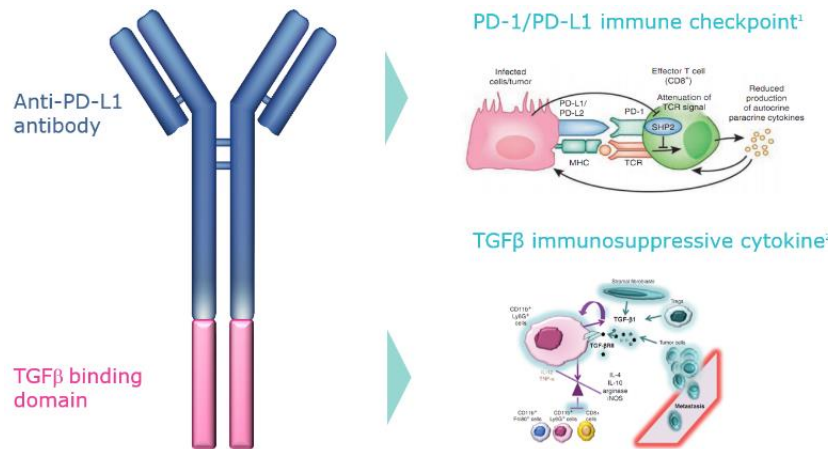
Next steps

- Alliance plans to pursue a regulatory submission in the US and discussions with other health authorities
- Renal 101 will continue as planned to the final analysis (OS)

¹ Motzer et al., „JAVELIN Renal 101: Randomized Phase 3 Trial of Avelumab + Axitinib vs Sunitinib as First-Line Treatment of Advanced Renal Cell Carcinoma“, presented at ESMO 2018; Avelumab plus axitinib significantly improve progression-free survival in untreated renal cell carcinoma [ESMO 2018 Press Release], published on 21 October 2018 at <https://www.esmo.org/Press-Office/Press-Releases/Javelin101-renal-cancer-immunotherapy-Motzer>

Anti-PD-L1/TGF- β trap (M7824) The first Phase II trial, evaluating M7824 monotherapy vs. pembrolizumab, was started in October 2018

Mode of Action



- Innovative **first-in-class bifunctional fusion protein** designed to simultaneously target two immune suppressive pathways (blocking PD-L1 and reducing TGF- β signaling)
- Bifunctional mode should result in broader application vs. respective mono-functional agents

Study Results & Next Steps

- **Manageable safety profile¹**
- Saturated peripheral PD-L1 and sequestered all released plasma TGF- β 1, - β 2, and - β 3¹
- Great potential when combined with Standard of Care, immunotherapy and internal pipeline drug candidates
- **Status Quo & Next Steps:**
 - ✓ Dose level finding of Phase I completed
 - ✓ Tested in 14 Phase Ib expansion cohorts across >700 patients
 - ➡ PhII study **M7824 monotherapy versus pembrolizumab** 1L, advanced NSCLC high PD-L1-tumor expressers started in October 2018
 - ➡ **Additional studies** to be started in the course of 2019
- **Criteria allowing timely decisions:**
 1. Expand cohort and/or explore single-arm path-to-registration
 2. Expand cohorts to confirm signal and/or follow with randomized comparative trial
 3. Explore biomarker driven pan-tumor opportunities
 4. De-prioritize cohort

¹ As presented by J. L. Gulley at ASCO Annual Meeting 2017, June 5, 2017.

Anti-PD-L1/TGF- β trap (M7824): Focus areas NSCLC & BTC

Updated data presented at ESMO 2018 defined next steps

NSCLC 2L

- **Need:** NSCLC accounts for 80-85% of all cases of lung cancer¹
- **Results: Encouraging efficacy comparing favorably** to established PDx-inhibitor monotherapy (IRC)^{2,3}:
 - **ORR (all-comers):** 27.0%
 - **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^{2,3}
- **Overall Survival by IRC (PD-L1 \geq 1%):**
 - M7824: **mOS not reached**, competitor: 12.7 months^{2,3}

Next steps

Further trial settings to be decided on in **H1 2019**

Biliary Tract Cancer (BTC)

- **Need:** Few available treatment options (no 2L standard of care)⁴
- **Results: Encouraging activity⁵** in 30 Asian patients with pretreated biliary tract cancer
- **ORR⁵:** 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 2L⁴)
- Responses observed **irrespective of PD-L1 expression levels⁵**

Next steps

2L BTC study to be initiated in **H1 2019**

¹ Jemal A et al., Cancer statistics, 2007, CA Cancer J Clin 2007;57:43-66; ² Paz-Ares et al., Poster presented at the 43rd European Society for Medical Oncology Annual Meeting, Munich, October 19–23, 2018, data shown for 1200mg Q2W dose; ³ 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)); ⁴ Lamarca A, et al. Ann Oncol. 2014;25(12):2328–2338; ⁵ Yoo et al., Poster presented at the 43rd European Society for Medical Oncology Annual Meeting, Munich, October 19–23, 2018

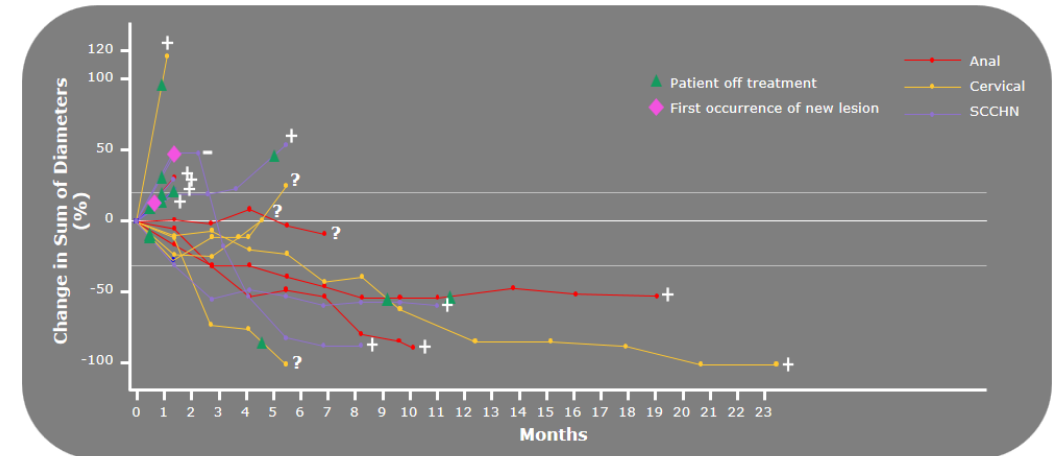
Anti-PD-L1/TGF- β trap (M7824): Phase Ib results (HPV cohort at NCI)

HPV-assoc. cancers as potential pan-tumor therapy – prospective study ongoing at NCI

Patients with HPV-assoc. cancers

- Analyses of HPV+ cervical/SCCHN tumor samples from TCGA/Oncomine show frequent dysregulation of TGF- β R1 signaling – suggesting this **pathway plays a role in HPV-mediated carcinogenesis**
- HPV associated** with almost all anal and cervical cancer, and some SCCHN²⁻⁴
- Retrospective subgroup analysis incl. 17 patients with HPV-associated cancers¹:
 - Activity in all three tumor types
 - Confirmed ORR = 41.7% (HPV+)**¹
 - Clinical activity of anti-PD-1 monotherapies in **range of 17–26%**⁵⁻⁸
- Phase II study by NCI** specifically accruing patients with HPV-associated malignancies

BOR as confirmed by independent radiologist¹

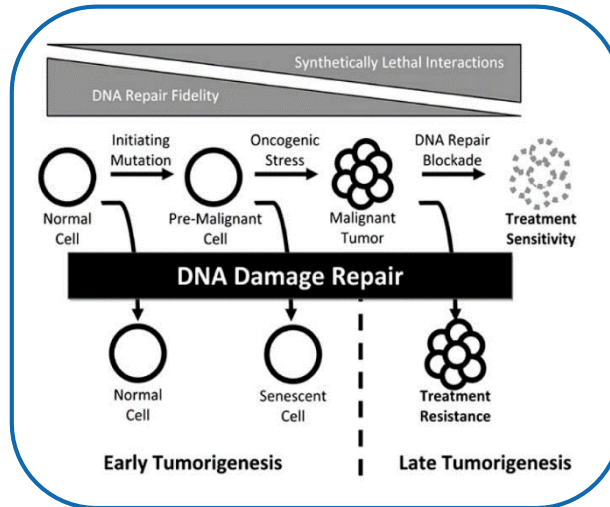


BOR, n (%)	N=17 (all HPV associated tumors)	N=12 (all HPV-positive)
ORR	6 (35.3) ¹⁰	5 (41.7) ¹⁰
CR	2 (11.8) ⁹	1 (8.3)
PR	4 (23.5) ¹⁰	4 (33.3) ¹⁰
SD	4 (23.5)	1 (8.3)
PD	7 (41.2)	6 (50.0)
DCR	10 (58.8) ¹⁰	7 (50.0) ¹⁰

¹ J.L. Gulley et al, ASCO, Jun 2018 (presentation); ² De Vuyst et al. Int J Cancer. 2009;124:1626–36; ³ Ihloff et al. Oral Oncol. 2010;46:705–11; ⁴ Mehanna et al. Head Neck. 2013;35:747–55; ⁵ Bauml et al. J Clin Oncol. 2015;33 (suppl; abstr TPS3094); ⁶ Ferris et al. N Engl J Med. 2016;375(19):1856; ⁷ Frenel et al. J Clin Oncol. 2017;35(36):4035; ⁸ Ott et al. Ann Oncol. 2017;28(5):1036; ⁹ 1 patient had a confirmed BOR or PR and an unconfirmed BOR of CR; ¹⁰ 1 PR did not meet the RECIST criteria

DNA damage response (DDR)

Complete portfolio supporting leadership in a potentially disruptive class

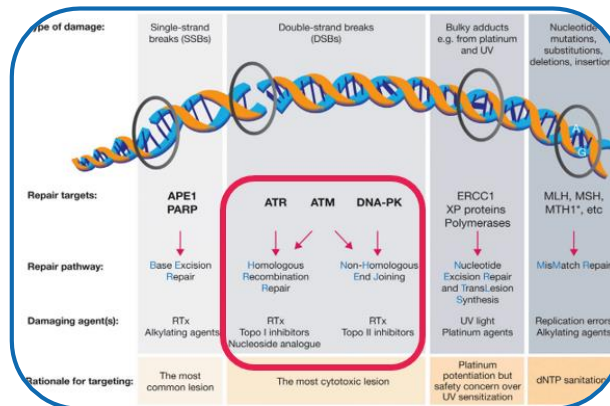


Genomic instability: a hallmark of late stage cancers¹

- 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)²



¹ Sources: O'Connor, Molecular Cell, 2015 | Benjamin et al., Current Drug Targets, 2010, 11, 1336-1340; ² "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 |

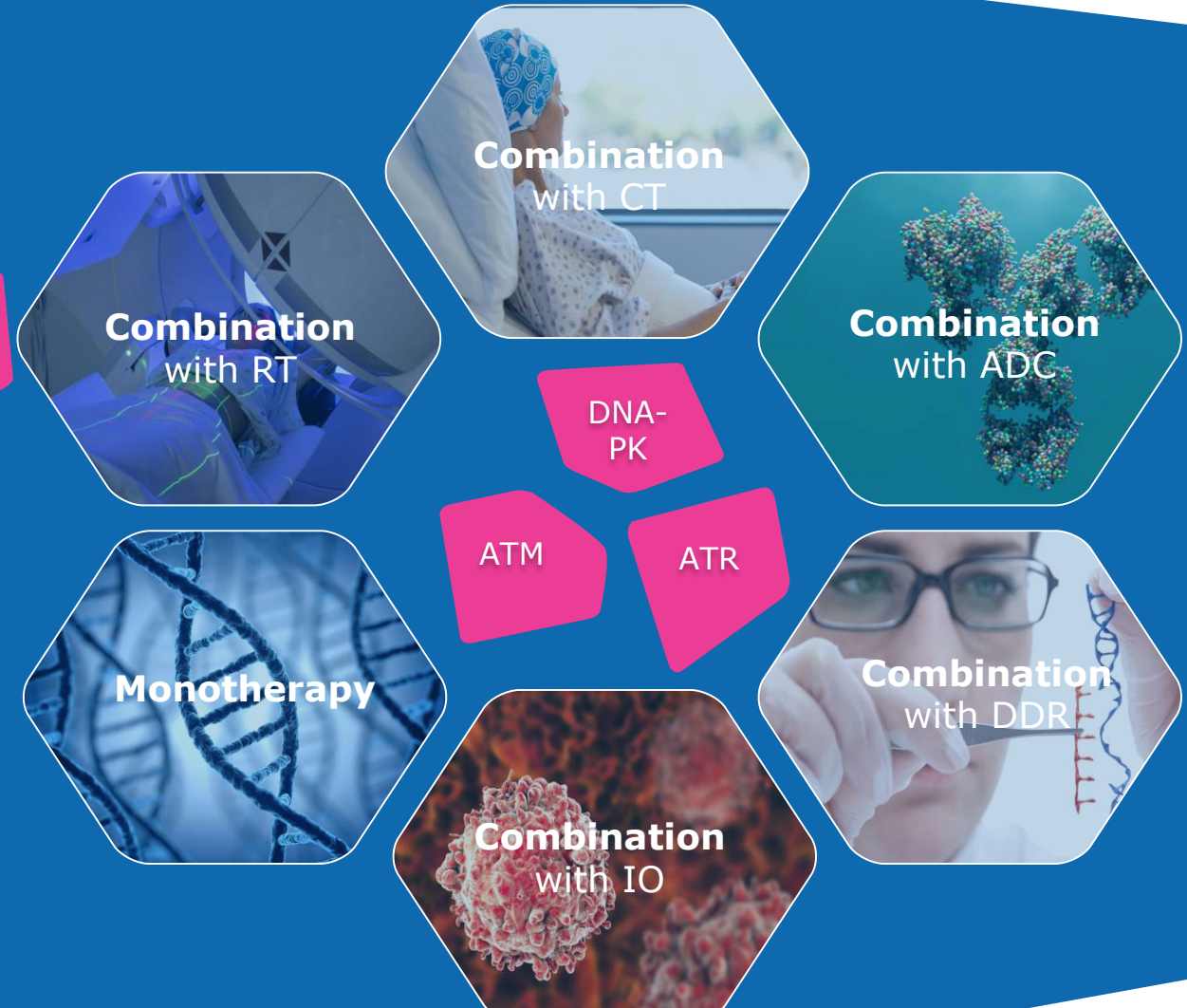
DNA damage response (DDR)

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)

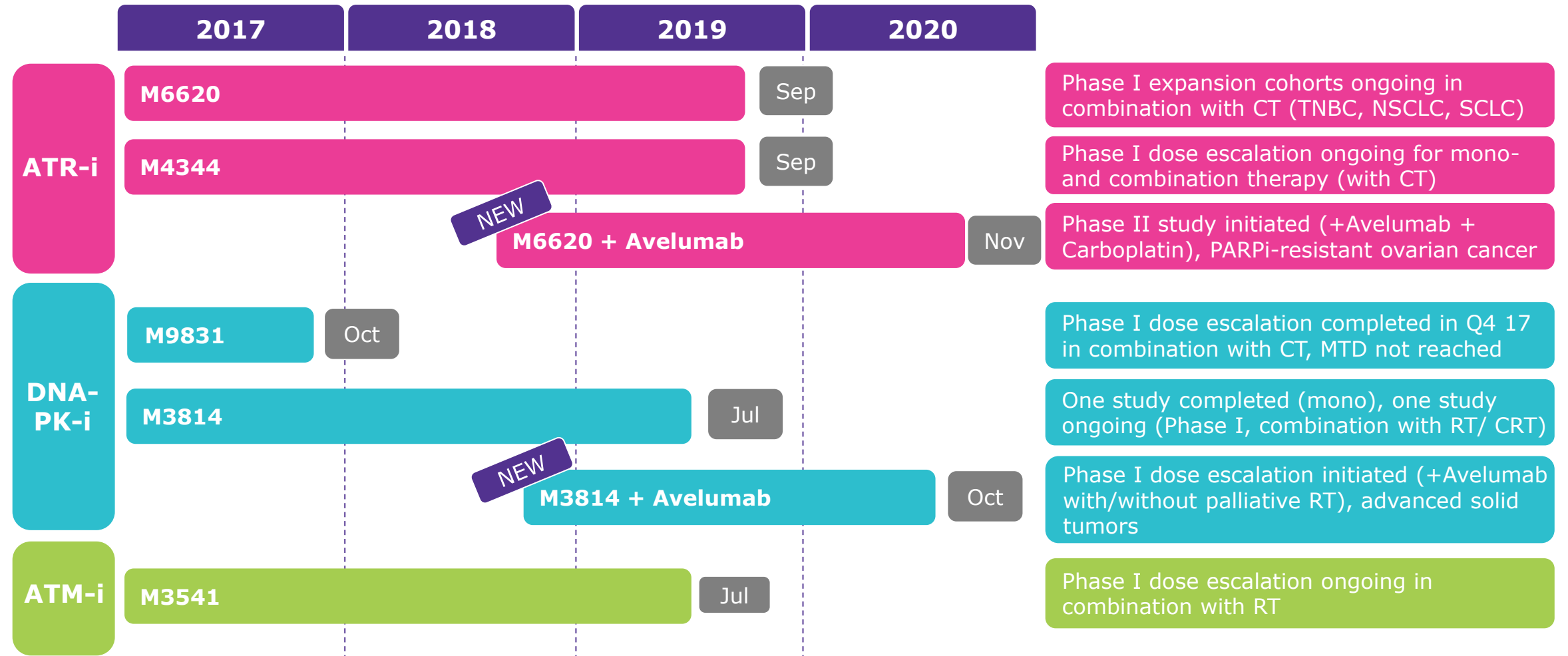
Significant share of patients to be treated with **CHECKPOINT INHIBITORS**



DNA damage response (DDR)

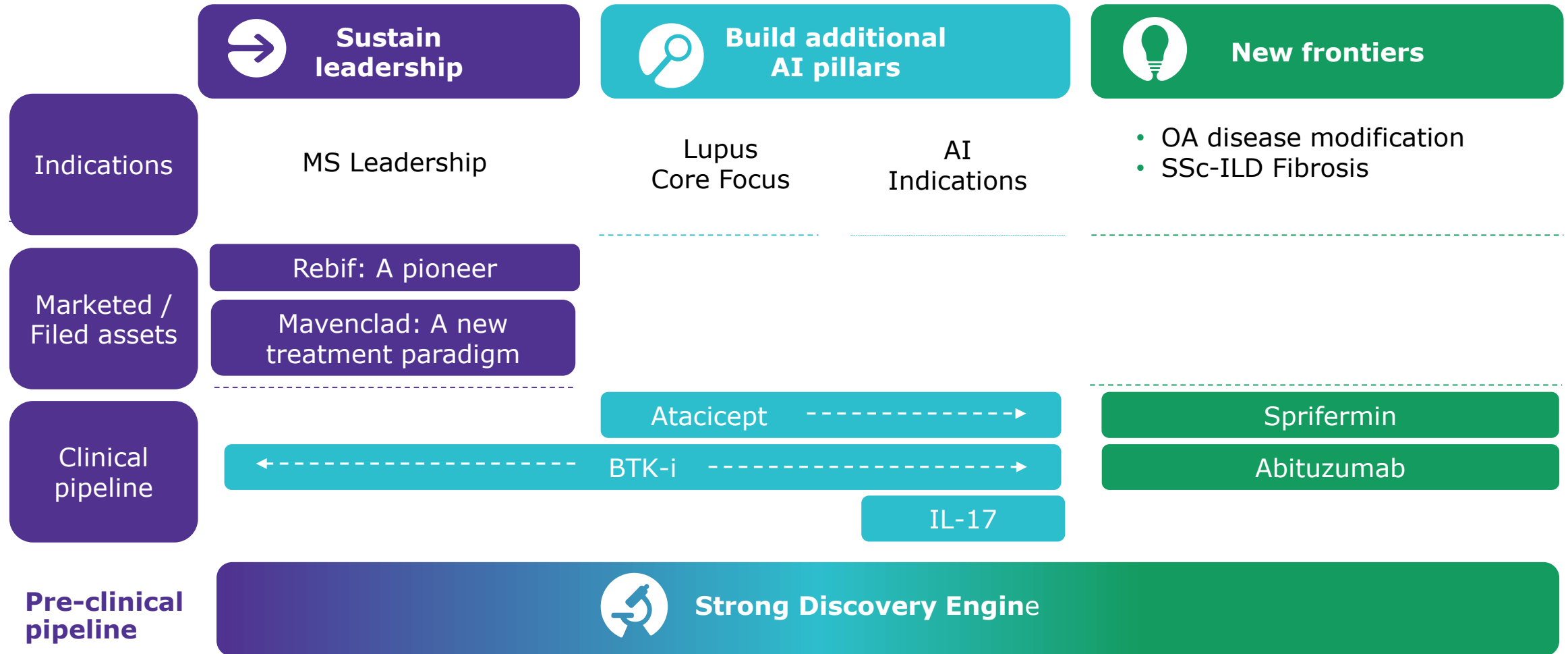
Clinical program targets three major DDR pathways, in mono- and combination (incl. Avelumab)

Estimated primary completion¹



¹ 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

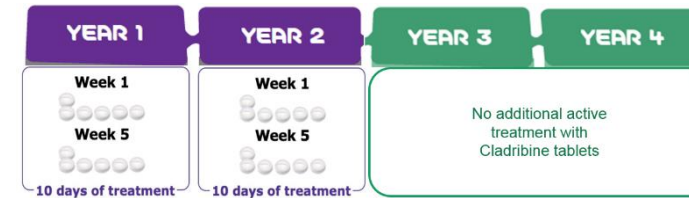
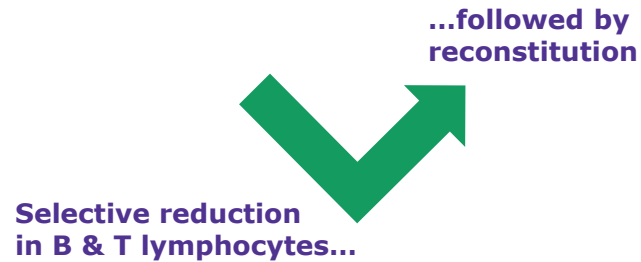
Immunology

Strategy is anchored on leadership in selected disease areas

Immunology

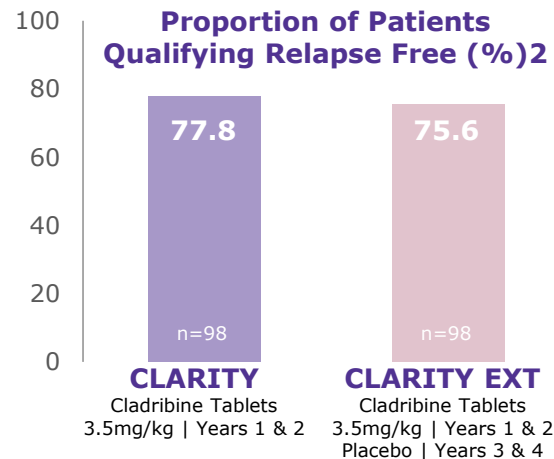
Mavenclad could change the MS treatment paradigm

Selective
immune
reconstitution
therapy
(SIRT)¹



Unique
posology:
max. 20 days
of oral
treatment³

4 years
disease
control with
treatment over
2 years²



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

Low
monitoring
requirements⁴

¹ 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]

² Giovannoni G et al. N Engl J Med 2010;362:416–26 | Giovannoni G et al. Mult Scler Aug 1 [Epub ahead of print] ³ 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 ⁴ 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

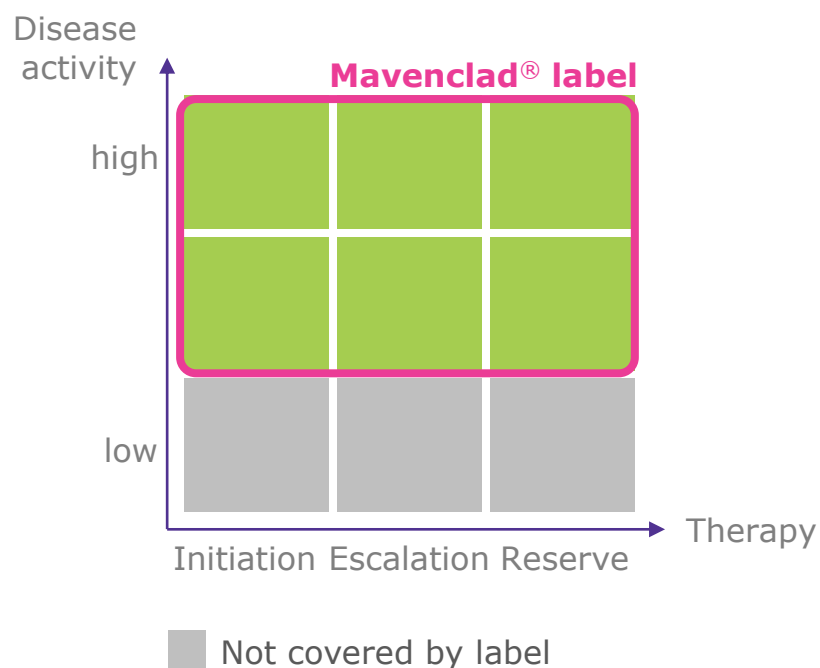
Mavenclad®'s attractive label¹ in Europe supports integrated franchise strategy

Mavenclad® label covers 60-70% of patients with RRMS² within the MS¹ patient population in Europe

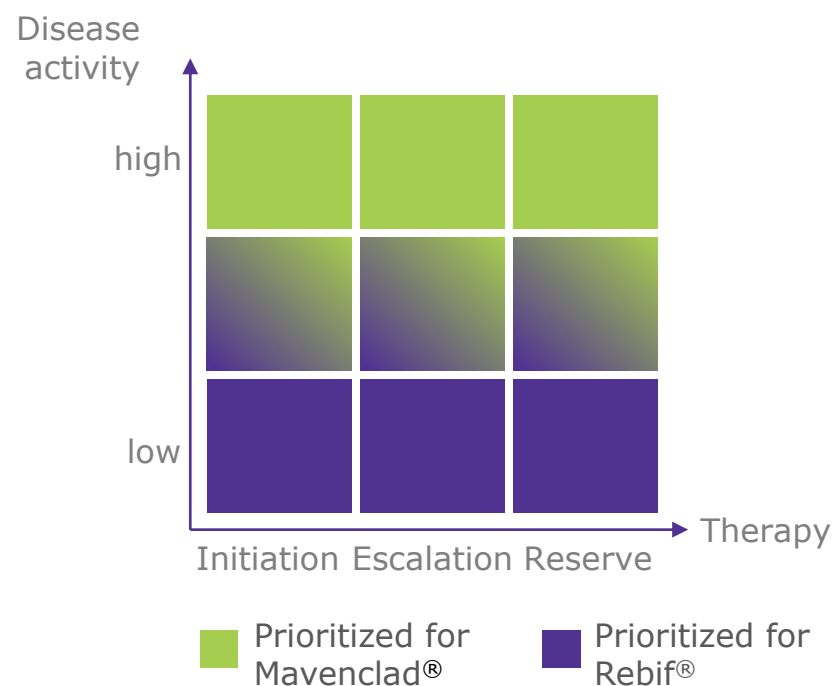
Our overall NDD franchise will cover a broad MS patient pool

Integrated franchise strategy

MS patient population³



RRMS patients, EU-5⁴



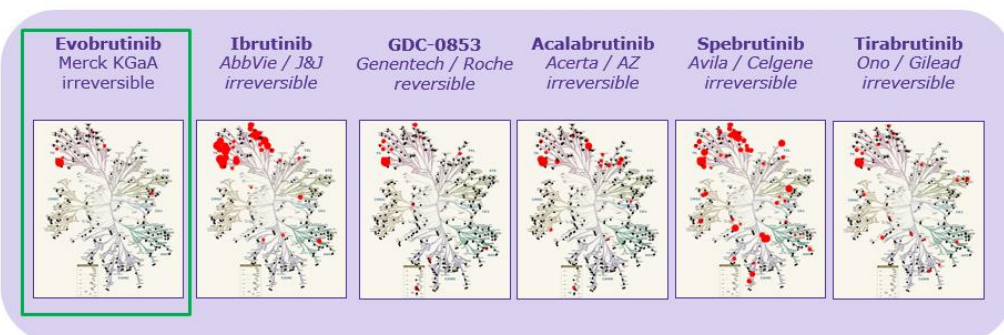
- ✓ At patient level: Rebif® and Mavenclad® are **highly complementary**
- ✓ At physician level: High overlap
- ✓ Franchise infrastructure investment benefits both brands

¹Mavenclad® label covers: RRMS+rSPMS+rPPMS; ²Abbreviations: RRMS = relapsing-remitting multiple sclerosis, MS = multiple sclerosis, rSPMS = relapsing secondary progressive MS, rPPMS = relapsing primary progressive multiple sclerosis; ³Source: Merck KGaA, Darmstadt, Germany; ⁴Source: 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

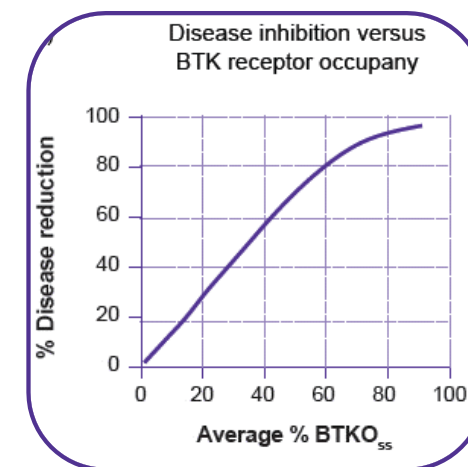
Safety: Promising kinase selectivity minimizing off-target effects¹



- 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 models¹

- 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 activity¹
- 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)



¹ "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)¹**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 dose²) 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: 0.20³
 - Evobrutinib 25 mg QD: 0.57
 - Evobrutinib 75mg QD: 0.13
 - Evobrutinib 75mg BID: 0.08

Safety:

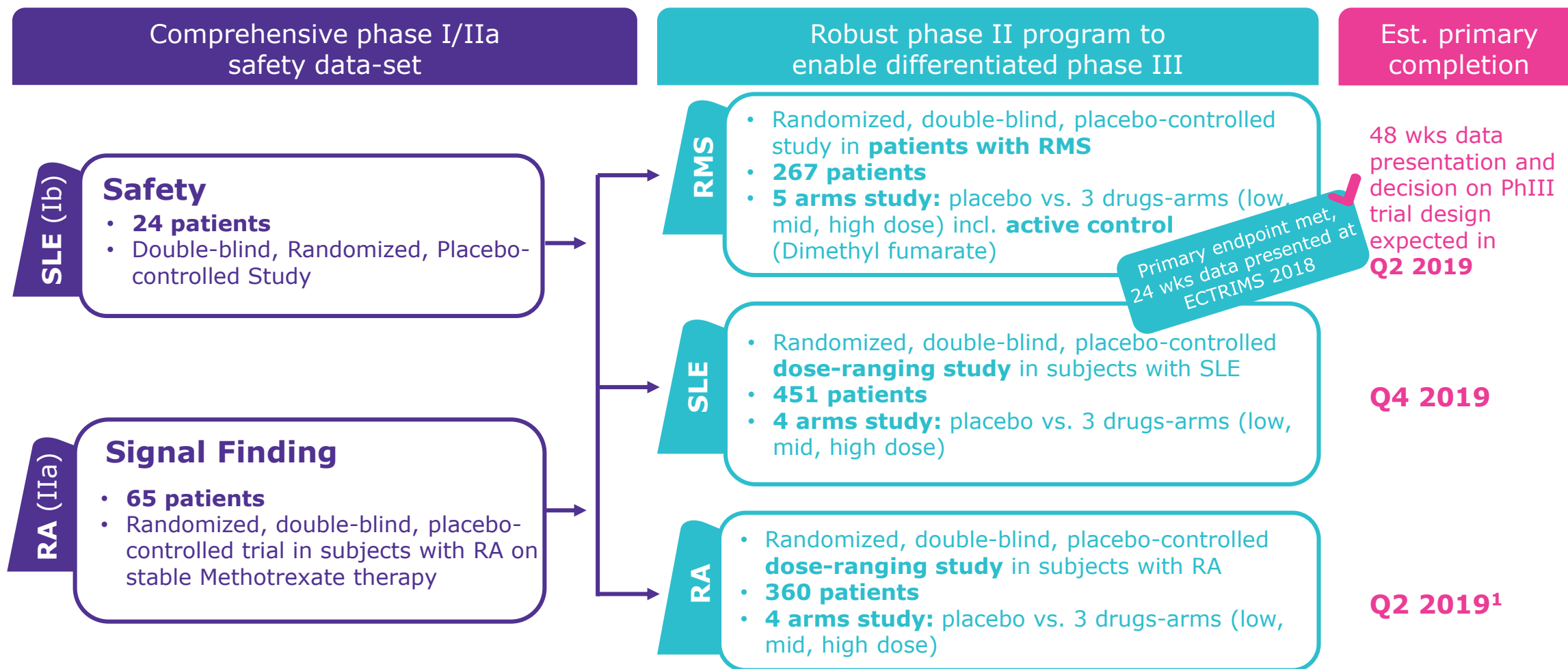
- Well tolerated, no treatment associated infections, infestations or lymphopenia observed
- Elevated ALT, AST and lipase levels observed were reversible and patients were asymptomatic

**Next
steps**

48 wks data, informing **Ph III trial design**, to be presented at an upcoming medical congress in 2019

Evobrutinib

Comprehensive development plan across immune-mediated diseases



¹ Data presentation not expected until Q3 2019.
All timelines are event-driven and may be subject to change.

Process Solutions

Next-generation bioprocessing on the cards

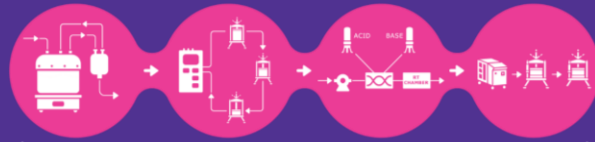
Make

purify

Today's
process & portfolio



MAb process intensification 2017 - 2020+



continuous processing >2025



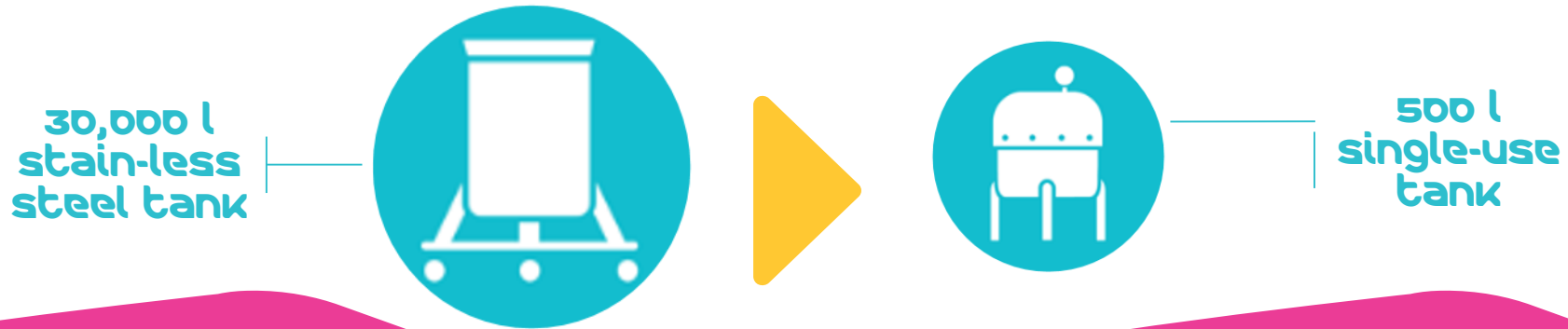
Continuous bioprocessing will ...

- 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 ²

Innovative single-use facility

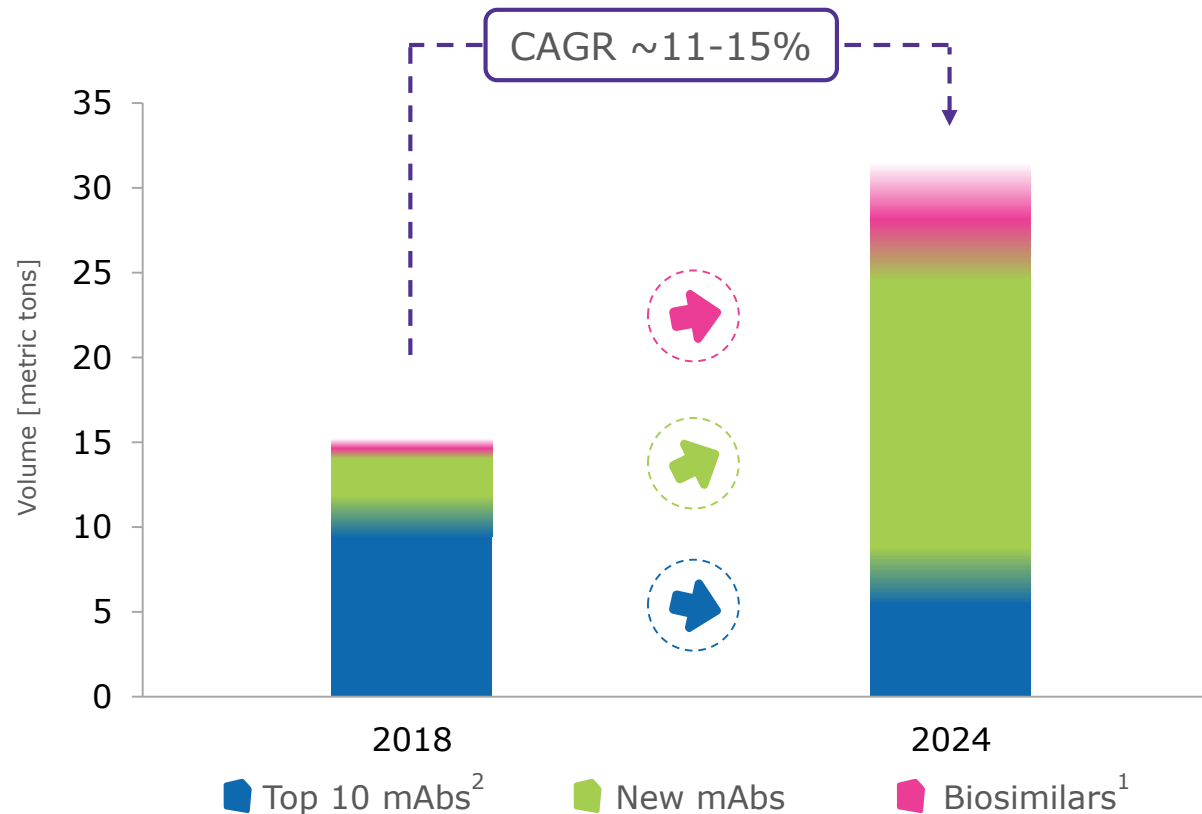
CAPEX required	\$20 m to \$100 m
Time to construct	1.5 years
Change over time	0.5 days
Footprint	~11,000 m ²

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

¹Biosimilars scaling factor = 2.8 based off internal estimates and McKinsey analysis; ²Top 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:*



sigmaaldrich.com	No. 1
thermofisher.com	No. 2
fishersci.com	No. 3
vwr.com	No. 4
emdmillipore.com	No. 5

>100 M unique visits

>€ 1.5 BN sales

>30% of our eCommerce orders contain products from former Sigma AND 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

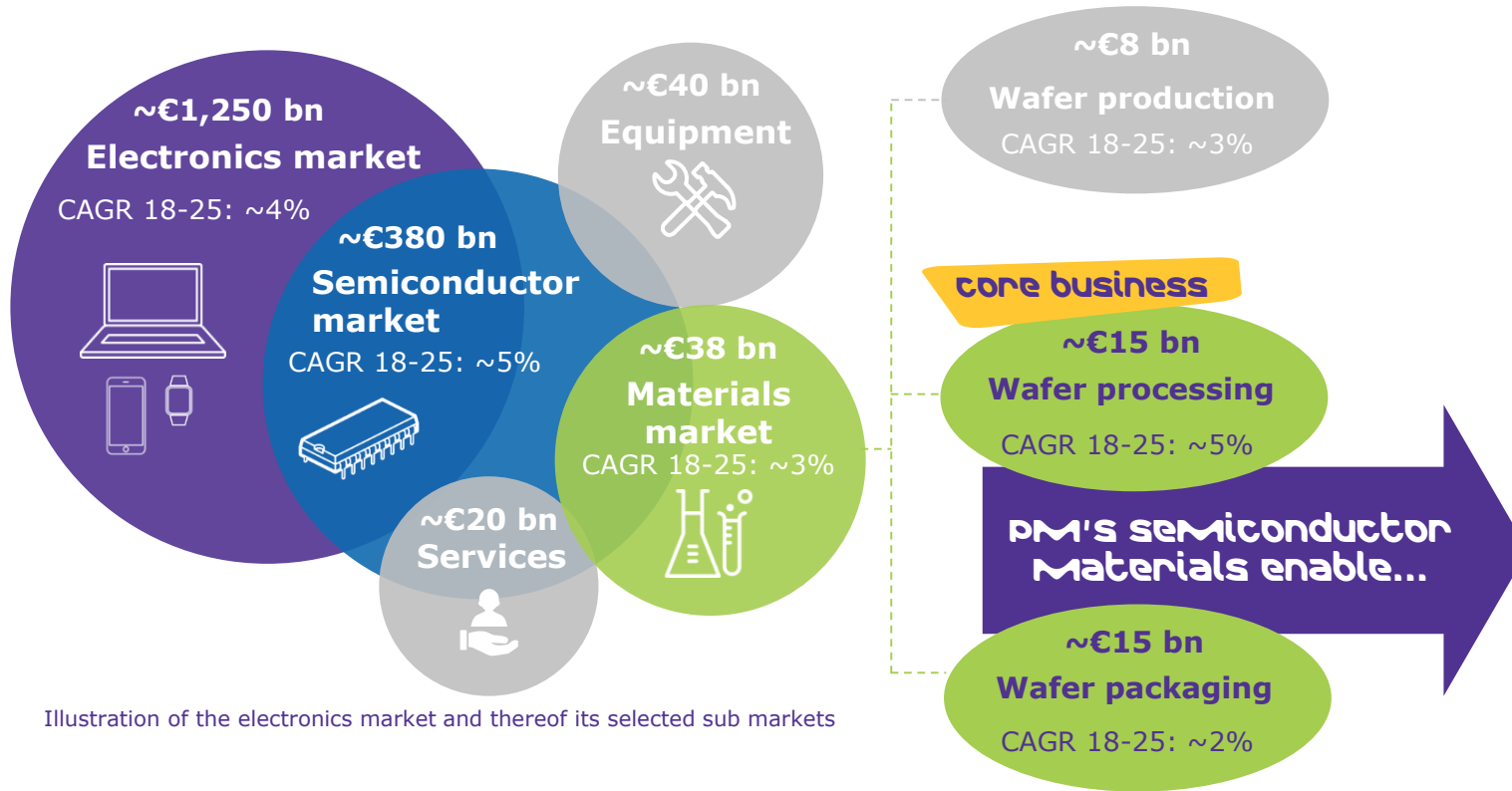


Illustration of the electronics market and thereof its selected sub markets

...customer needs

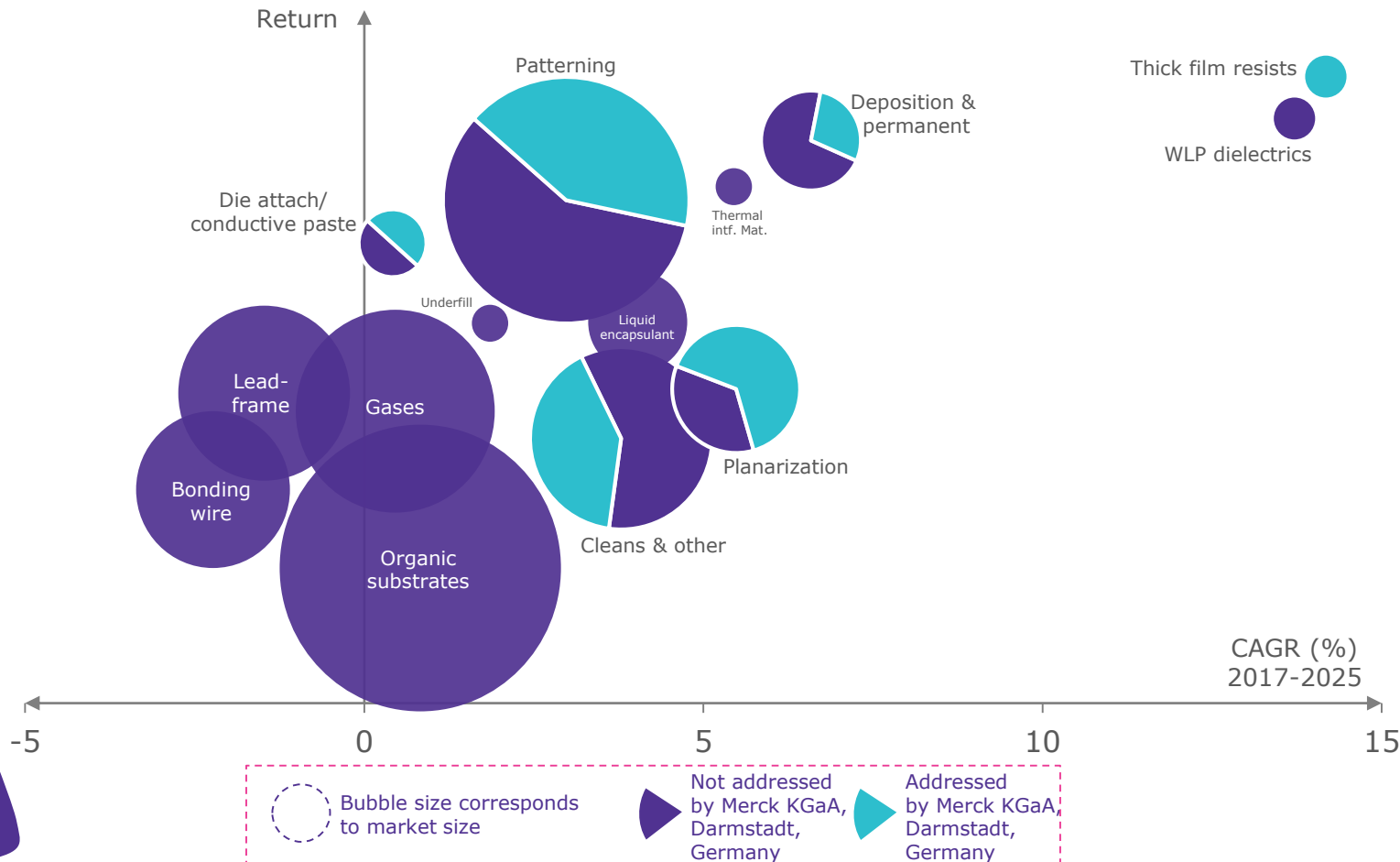
- Smaller structures beyond limitations of existing technologies
- Higher memory capacity, faster processing speed, less power consumption
- Improved yield and lower processing costs

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

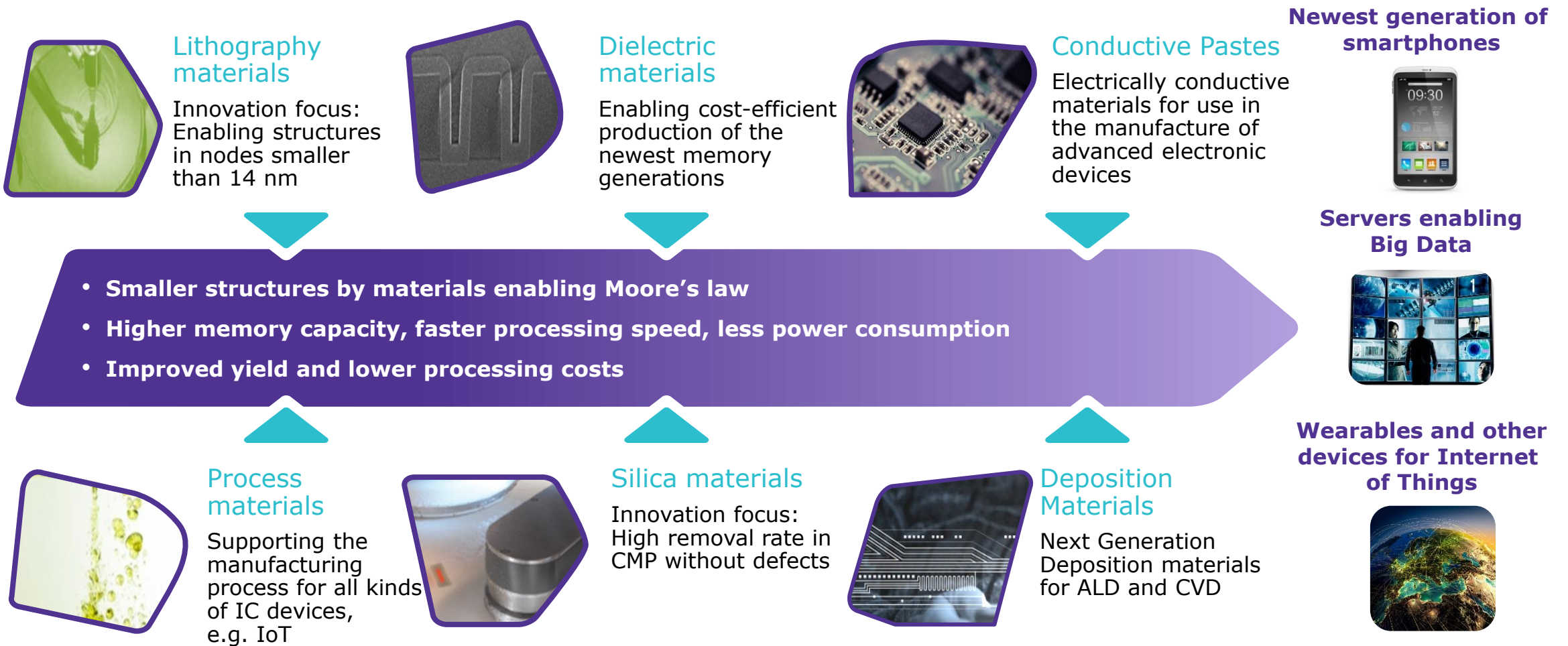


Market positioning

- 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

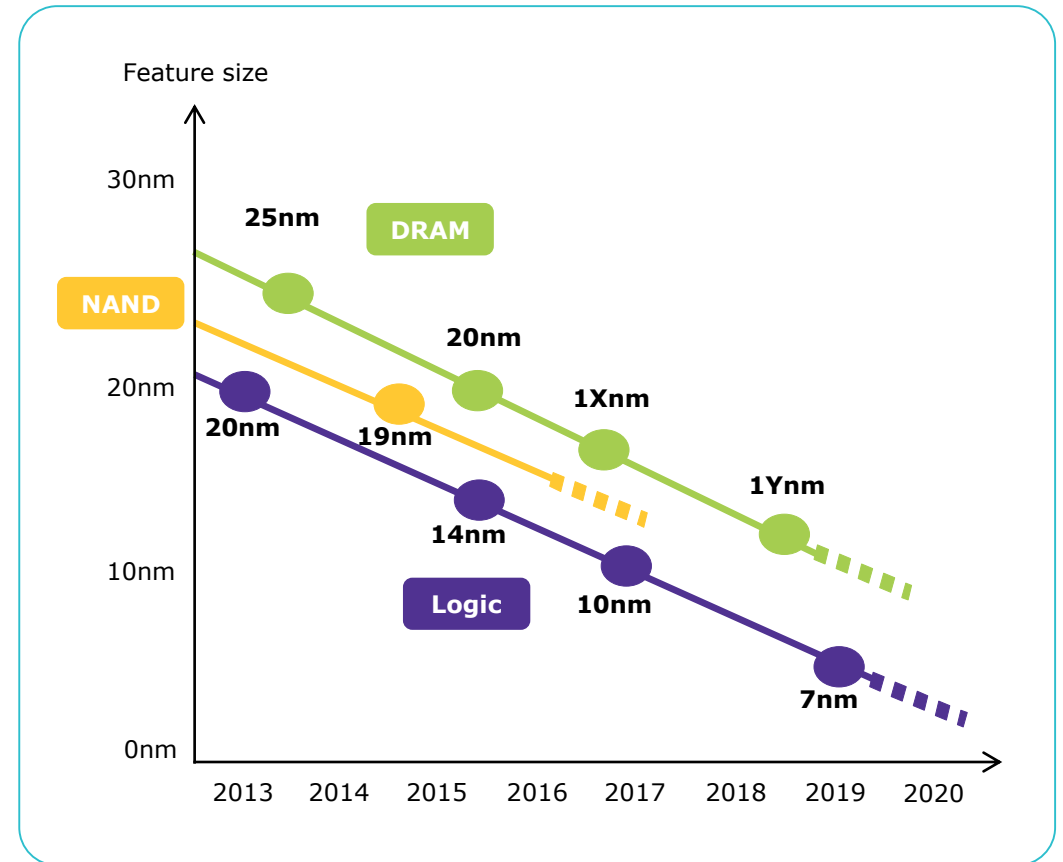
Big Data: Increasing need for intelligent data storage

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

Selected competitors

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

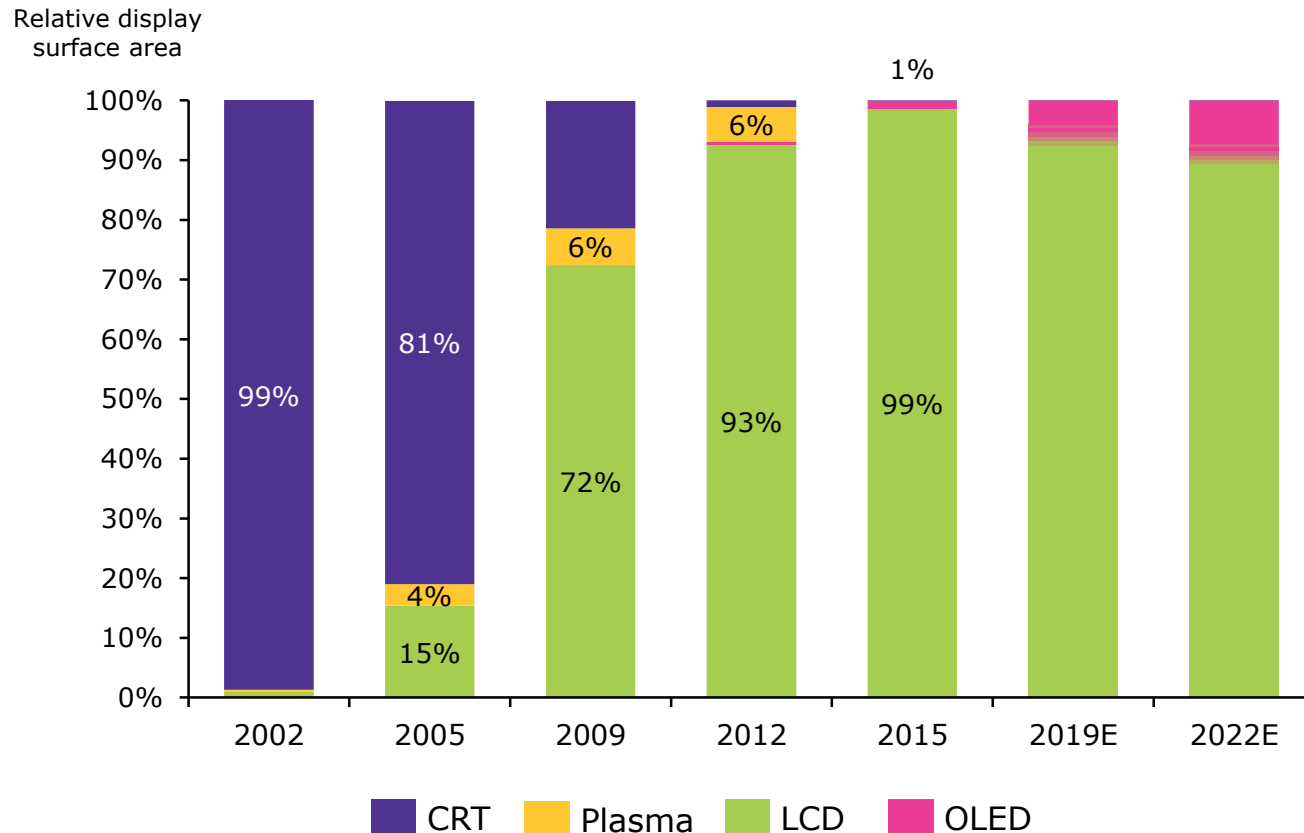
Feature sizes develop as predicted by Moore's law



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:

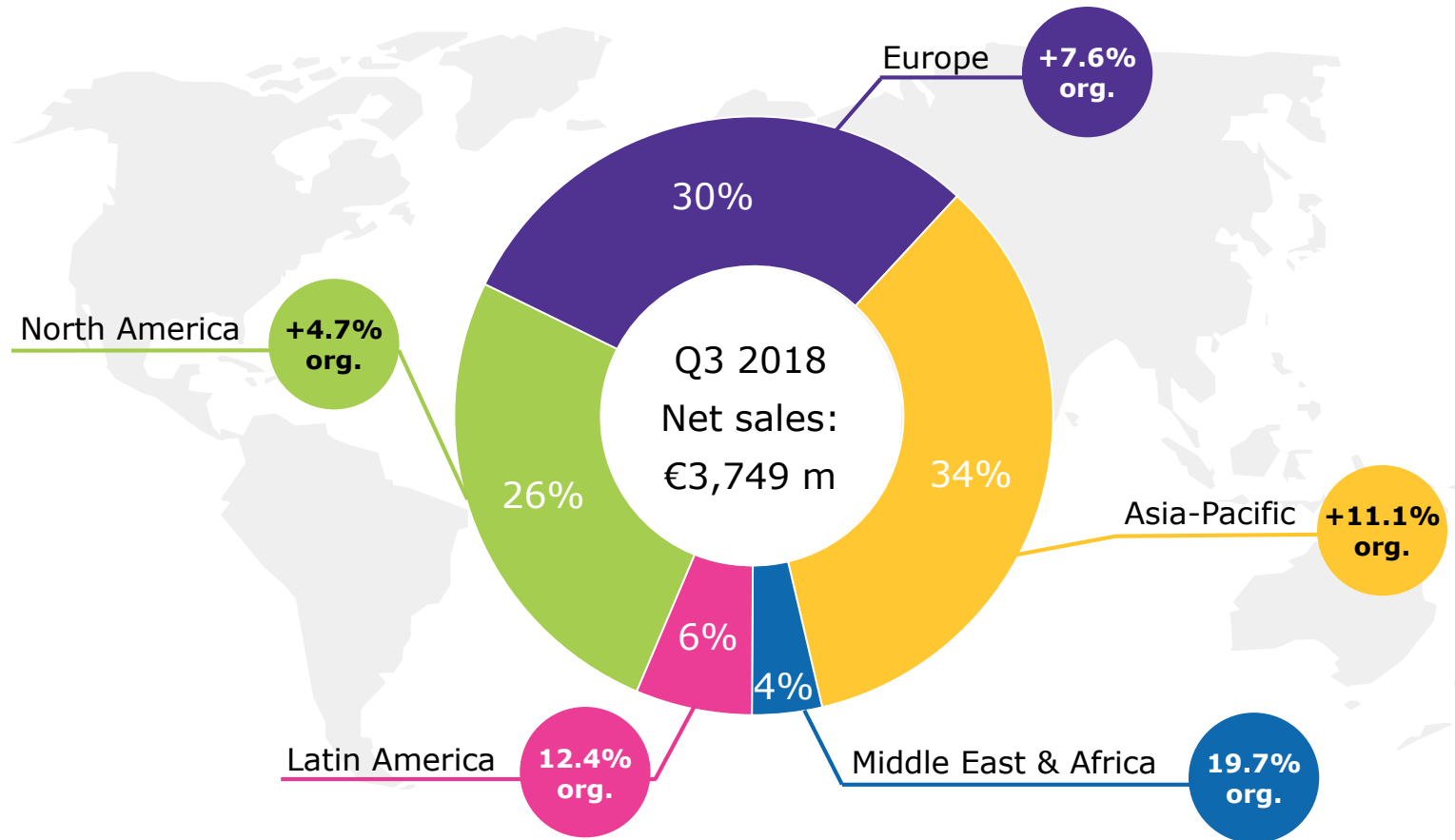
- Price and scalability
- Production costs and capacities

LCD progress creates higher technological and commercial entry barriers

OLED share will increase in mobile applications

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[®] ramp up, and continued resilience of Fertility
- Solid growth in North America due to Life Science; Fertility and Bavencio[®] more than offset ongoing decline of Rebif[®]
- 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[®] and tender phasing of Erbitux[®]

Q3 2018: Overview

Key figures

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

[€m]	Dec. 31, 2017	Sept. 30, 2018	Δ
Net financial debt	10,144	10,168	0.2%
Working capital	3,387	3,784	11.7%
Employees*	52,941	54,756	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 30th 2018
- Working capital reflects strong organic sales growth
- Higher headcount related to growth initiatives in Life Science and launch activities in Healthcare

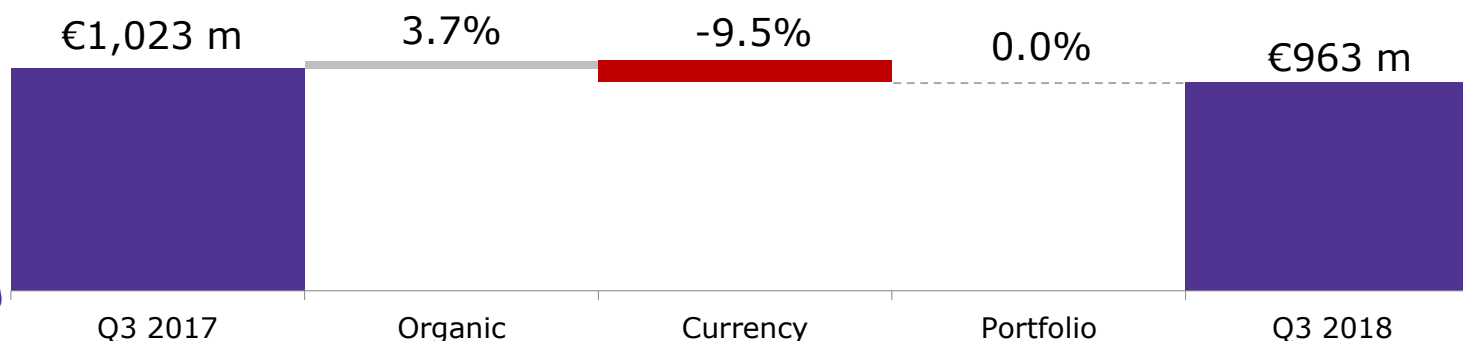
Organic growth across all business segments

Q3 2018 YoY net sales

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

- Healthcare reflects strong growth driven by solid core business and launches of Mavenclad[®] and Bavencio[®]
- 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*

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

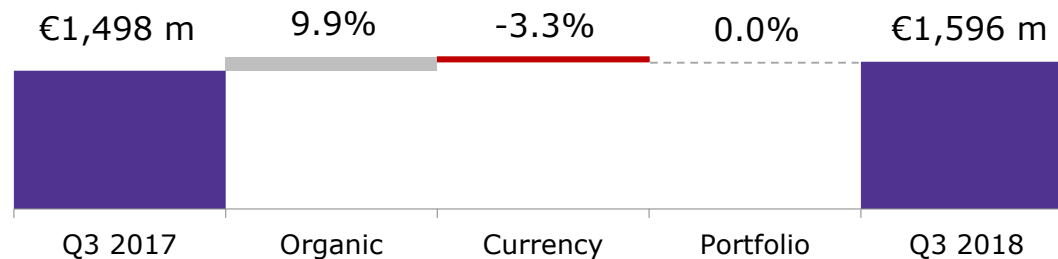
Healthcare P&L

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

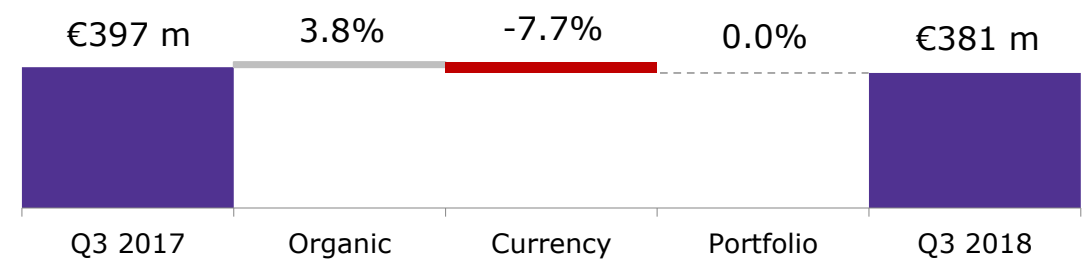
Comments

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

Net sales bridge



EBITDA pre bridge



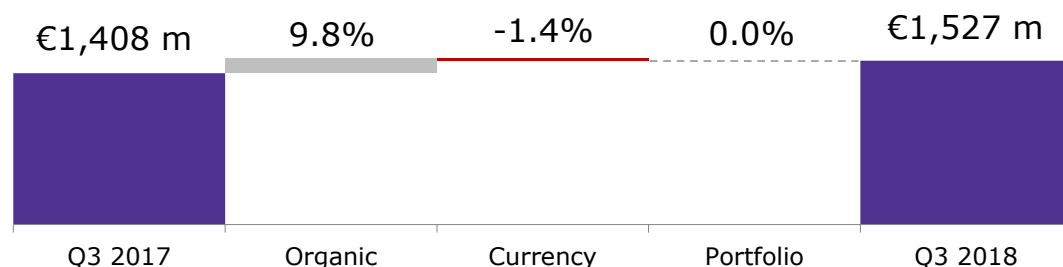
Totals may not add up due to rounding;
* BRL = Brazilian real; ARS = Argentine peso

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	1,527
Marketing and selling	-412	-443
Administration	-59	-69
Research and development	-60	-59
EBIT	220	277
EBITDA	401	449
EBITDA pre	426	460
Margin (in % of net sales)	30.2%	30.1%

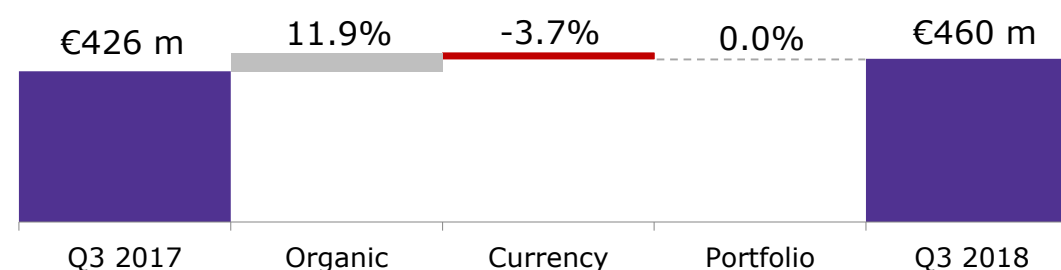
Net sales bridge



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

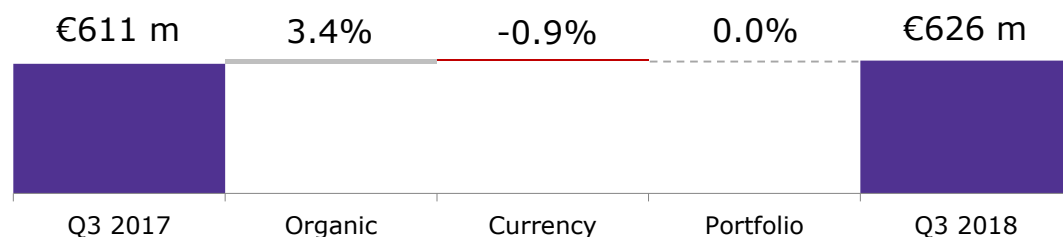


Performance Materials: Organic growth mainly driven by Semiconductor Solutions

Performance Materials P&L

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

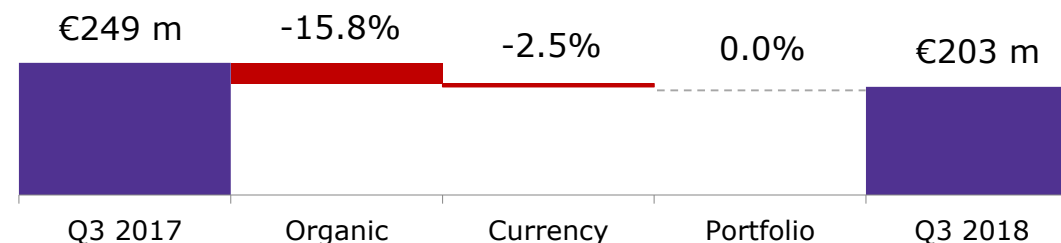
Net sales bridge



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

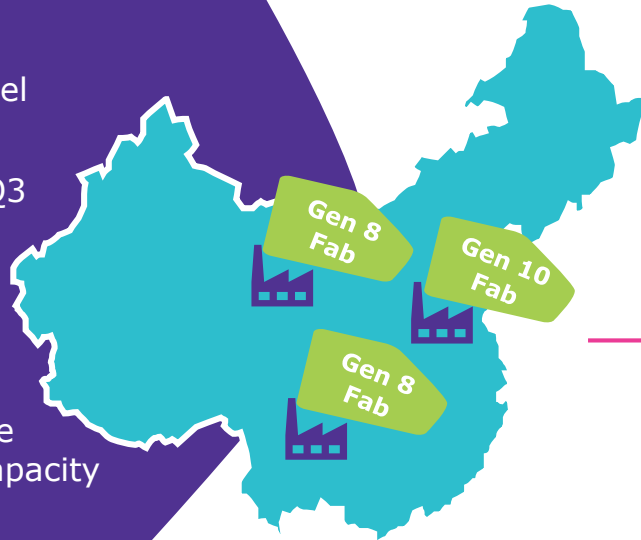
- Continued increasing demand in UB-FFS for small devices
- Partner of choice for bringing new capacity online (limited time frame)
- Underlying trend of declining LC materials market still valid
- LC related materials < 50% of total PM net sales
- OLED participating in capacity expansion with double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

*CMP = chemical mechanical planarization

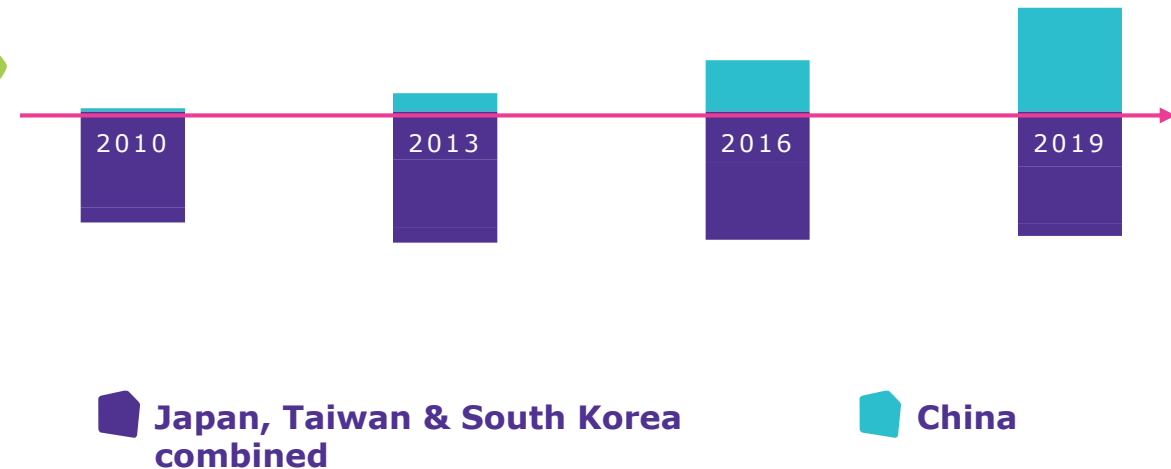
Performance Materials: Liquid crystals currently benefitting from new display-panel plant capacity ramp up projects

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



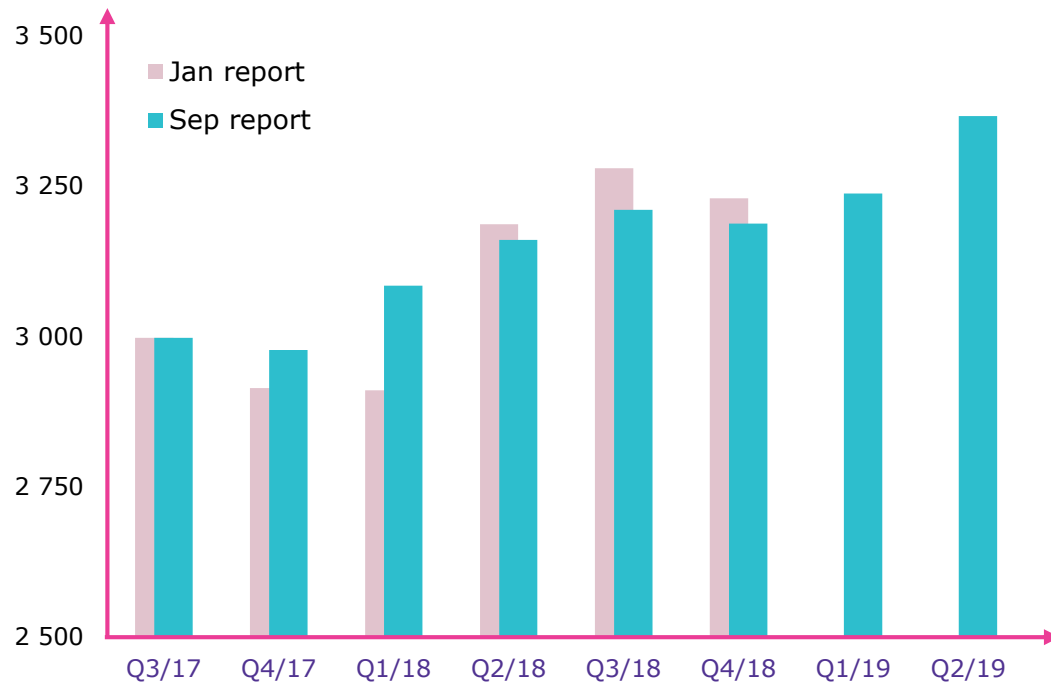
Share of global display production capacities by region [km²]*



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

Reported figures

Reported results

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

Comments

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

^{*}From continuing and discontinued operations;
Totals may not add up due to rounding

Cash flow statement

Q3 2018 – cash flow statement

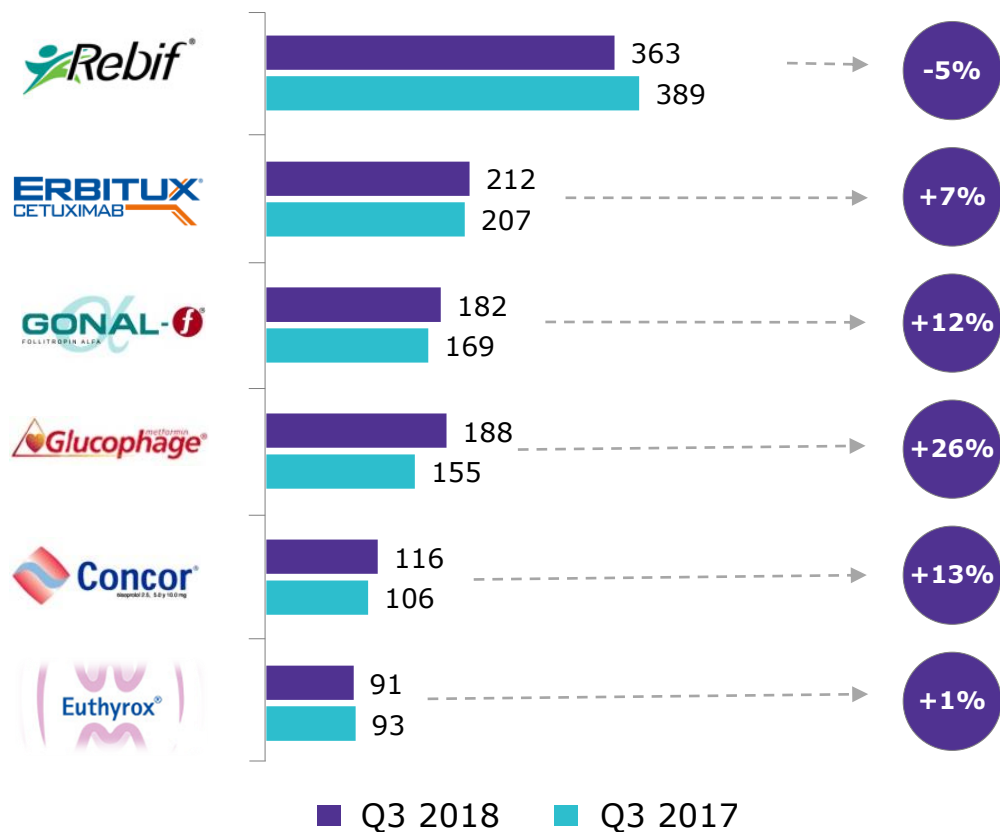
[€m]	Q3 2017	Q3 2018	Δ
Profit after tax	648	345	-303
D&A	419	428	9
Changes in provisions	-50	69	119
Changes in other assets/liabilities	99	6	-93
Other operating activities	-327	-9	318
Changes in net working capital	-31	-107	-76
Operating cash flow	758	731	-27
Investing cash flow	-90	-218	-128
thereof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

Cash flow drivers

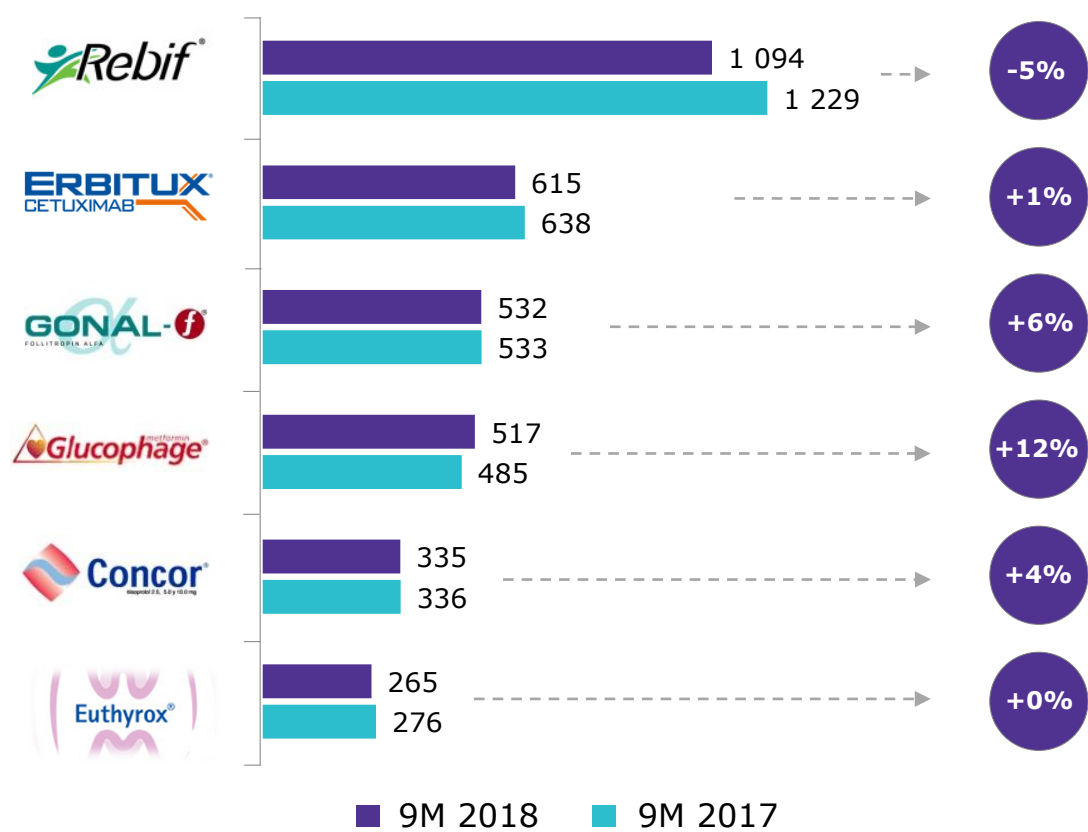
- LY profit after tax reflects gain from Biosimilars divestment, which is neutralized in other operating activities
- Changes in provisions driven by pension provisions and LTIP
- Changes in other assets/liabilities includes LY upfront payment from Fresenius for future R&D activities
- Changes in working 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

Healthcare organic growth by franchise/product

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



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

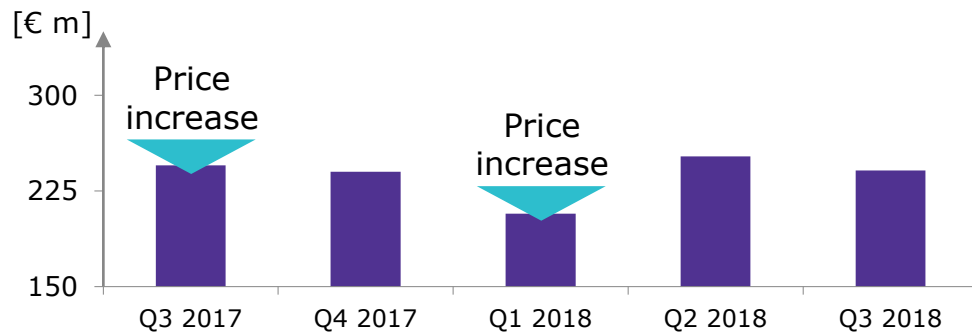


Totals may not add up due to rounding

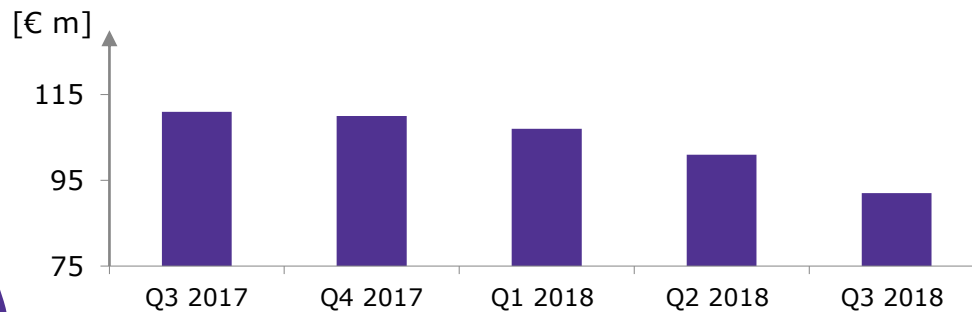
Rebif®: Ongoing decline in line with interferon market

Rebif® sales evolution

North America



Europe



Q3 2018 Rebif® performance

Q3 drivers

-1.8% org.

- Price
- Volume
- FX

- Rebif® 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

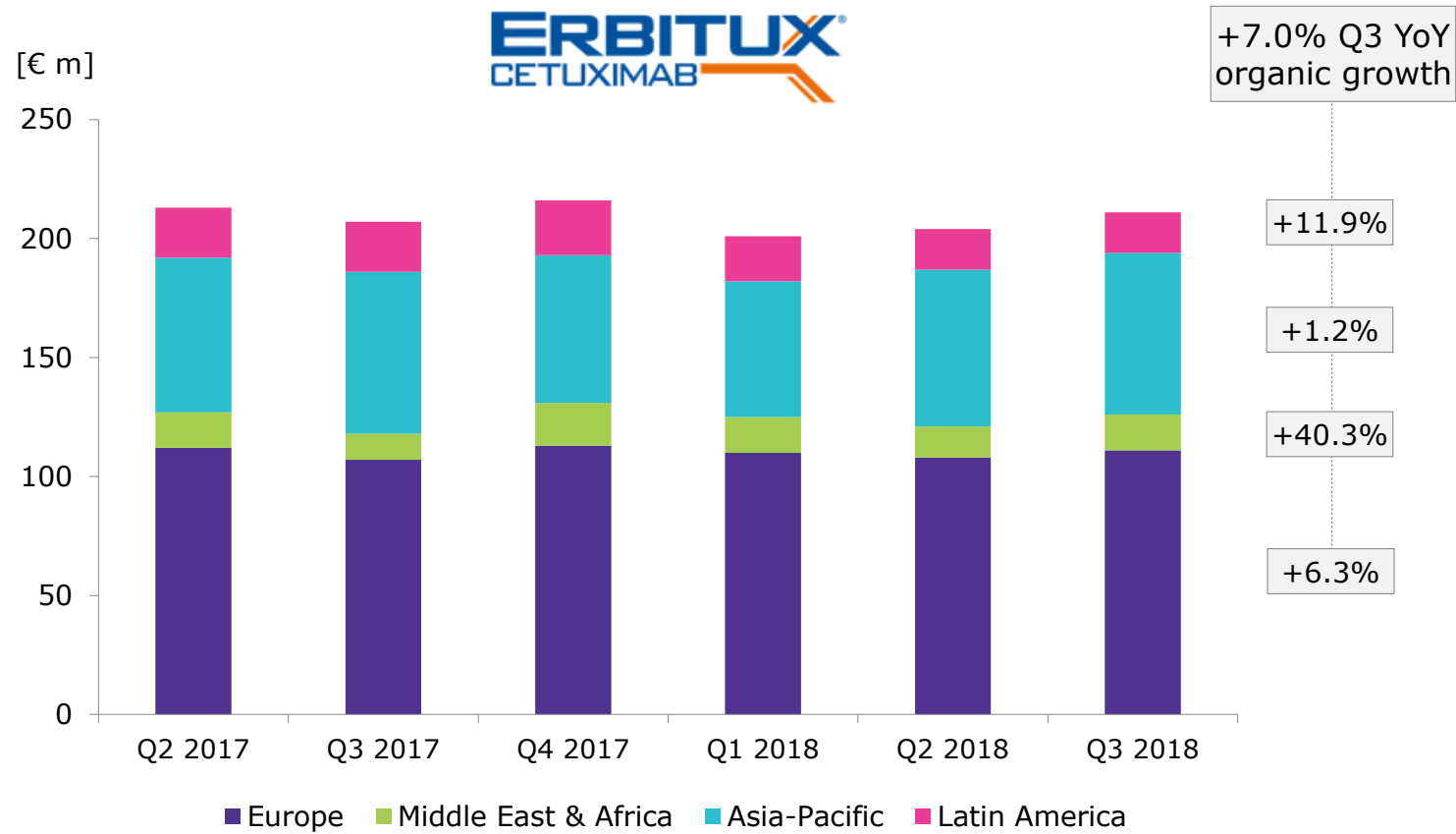
Q3 drivers

-15.5% org.

- Price
- Volume
- FX

Erbitux[®]: A challenging market environment

Erbitux[®] sales by region



Q3 2018 Erbitux[®] performance

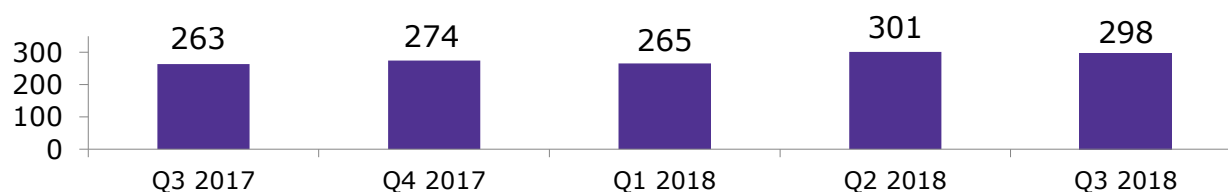
- Absolute sales increase to €212 m due to organic sales growth of +7.0%, mitigated by FX headwinds of -5.0% mainly from LATAM and EU
- Growth in Europe due to tender phasing; still impacted by ongoing competition, price reductions and shrinking market size due to increasing i-onc trials
- APAC about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

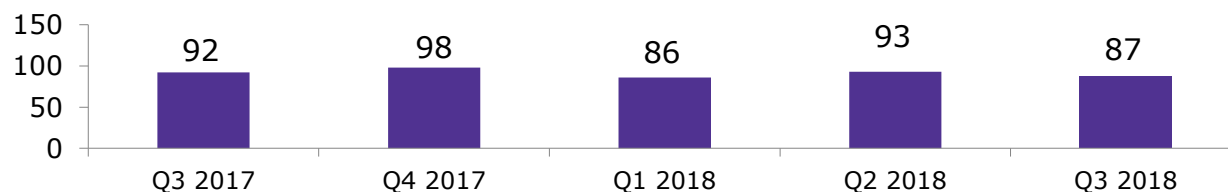
[€ m]



Organic
+17.9% org.

Endocrinology

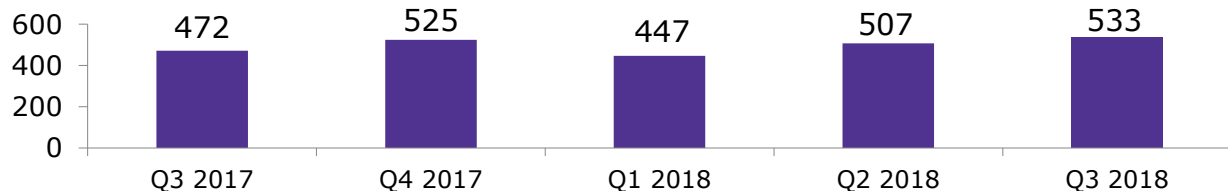
[€ m]



Organic
-1.1% org.

General Medicine*

[€ m]



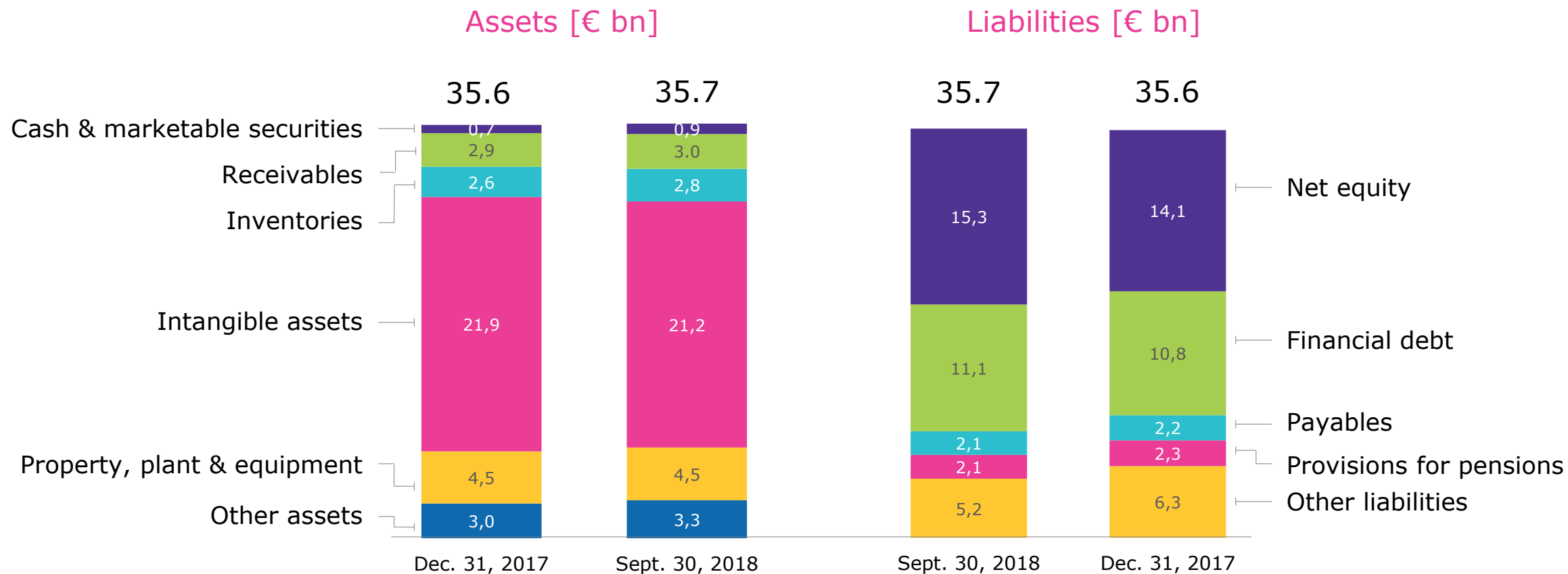
Organic
11.9% org.

Q3 2018 organic drivers

- Fertility with double digit growth across all regions, especially in North America, APAC and Europe
- Gonal-f[®] 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[®] (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

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

Adjustments in Q3 2018

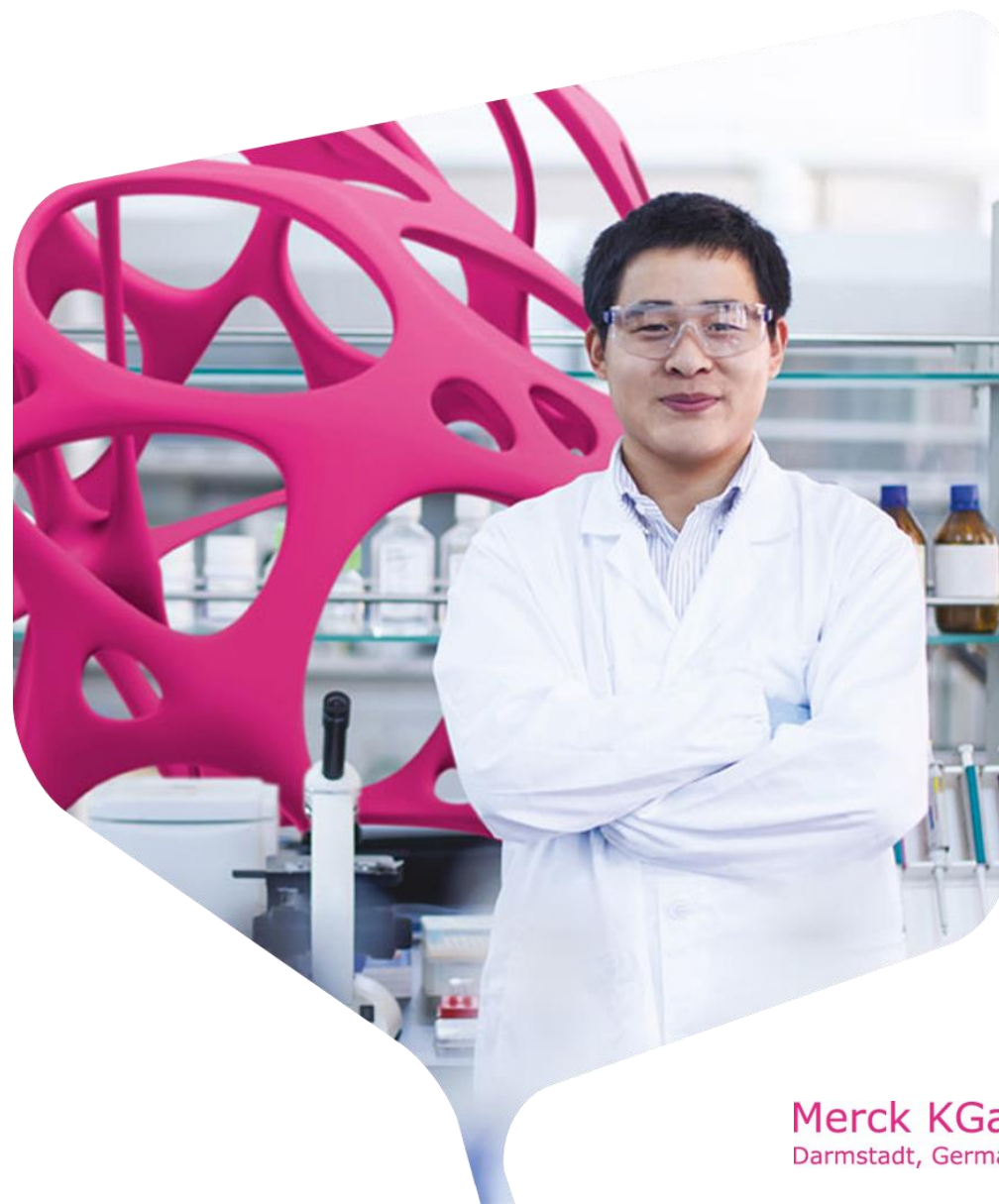
Adjustments in EBIT

[€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

Totals may not add up due to rounding

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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