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Agenda

01

Business Overview

Three high-tech businesses competing in attractive markets

Healthcare

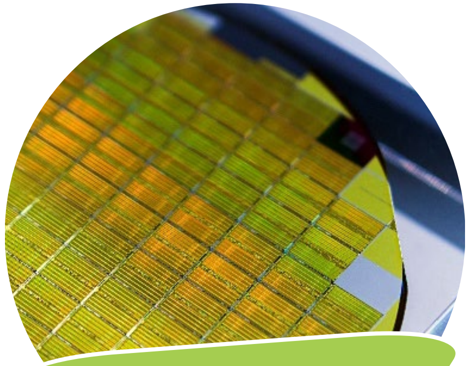
Leading in specialty pharma markets

- 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 and Allergopharma

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

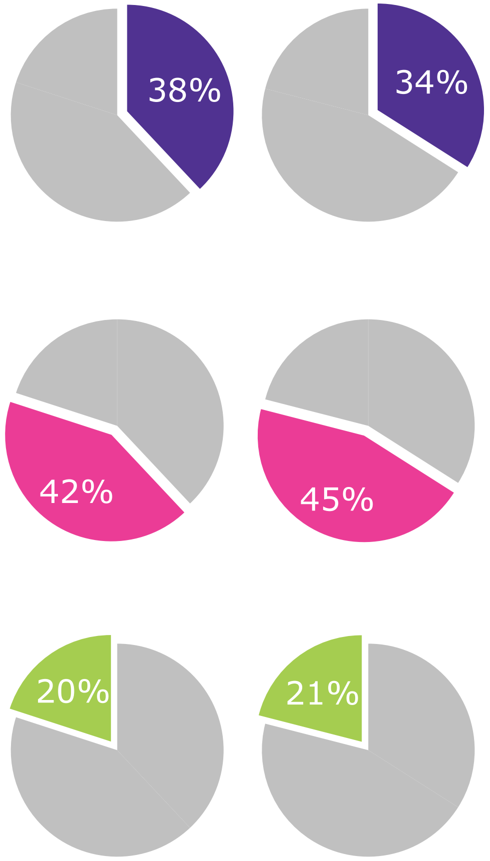
Leading company in high-tech solutions

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

Merck KGaA, Darmstadt, Germany, today – three strong pillars as basis for profitable growth

H1 2020 contribution to

Sales | EBITDA pre



1. Healthcare

Global specialty innovator poised for above-industry growth

- **Resilient core business** backed by excellent life cycle management
- **Strong growth** from new products, late-stage pipeline assets with blockbuster potential
- **Rigorous cost discipline** and value-maximizing pipeline prioritization

2. Life Science

Diversified industry leader poised for above-market growth

- **Portfolio advantage** and outperformance drive above-market growth
- **Strengthen core**: products (PS), chemistry (RS), lab water (AS)
- **Establish new pillars**: PS services, gene editing and novel modalities

3. Performance Materials

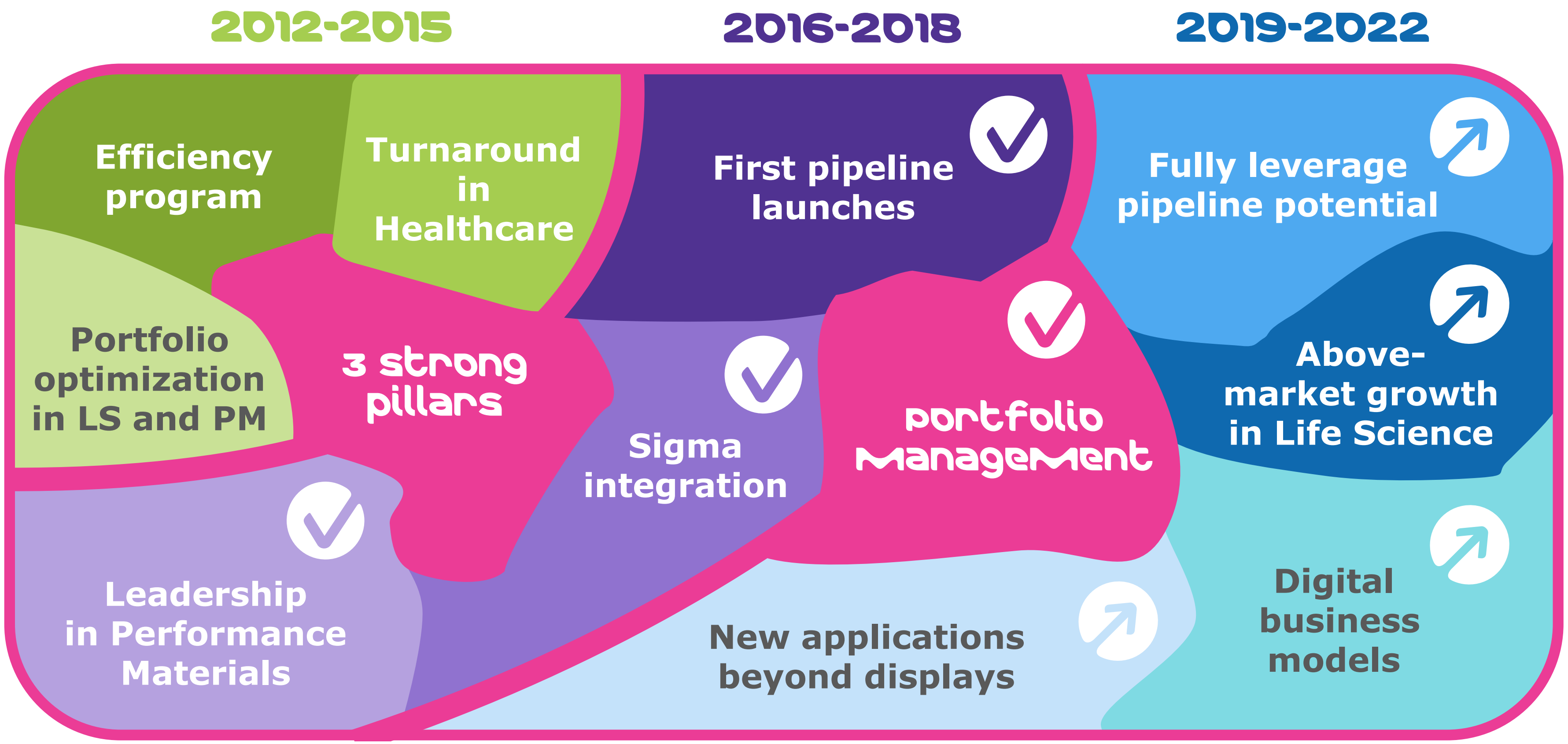
Leading electronics player poised for accelerating growth

- **Growing semiconductor share** as key driver for acceleration
- **More resilient growth** through rising diversification
- **Strict cost discipline** in maturing parts of the portfolio

Acronyms: PS = Process Solutions, RS = Research Solutions, AS = Applied Solutions

Group

The 2016 vision – a strategic agenda until 2022



Executing on the growth and expansion phase of the 2016-22 strategic agenda

= delivered; = well on track

2021 and beyond – poised for growth in a challenging environment

COVID -19

Trade Wars

World Economy

Group-wide: Profitable Growth & Cost Discipline

Healthcare

- Drive profitable growth through pipeline launches
- Execute on stringent cost discipline

China VBP

US Health Policy

Life Science

- Continue to outperform the market
- Sustain industry leading profitability

Industry Consolidation

Novel Modalities

Performance Materials

- Accelerate top-line growth
- Keep margins at attractive level

China Auto

Semicon Cyclicality

Staying on course in a potentially volatile environment

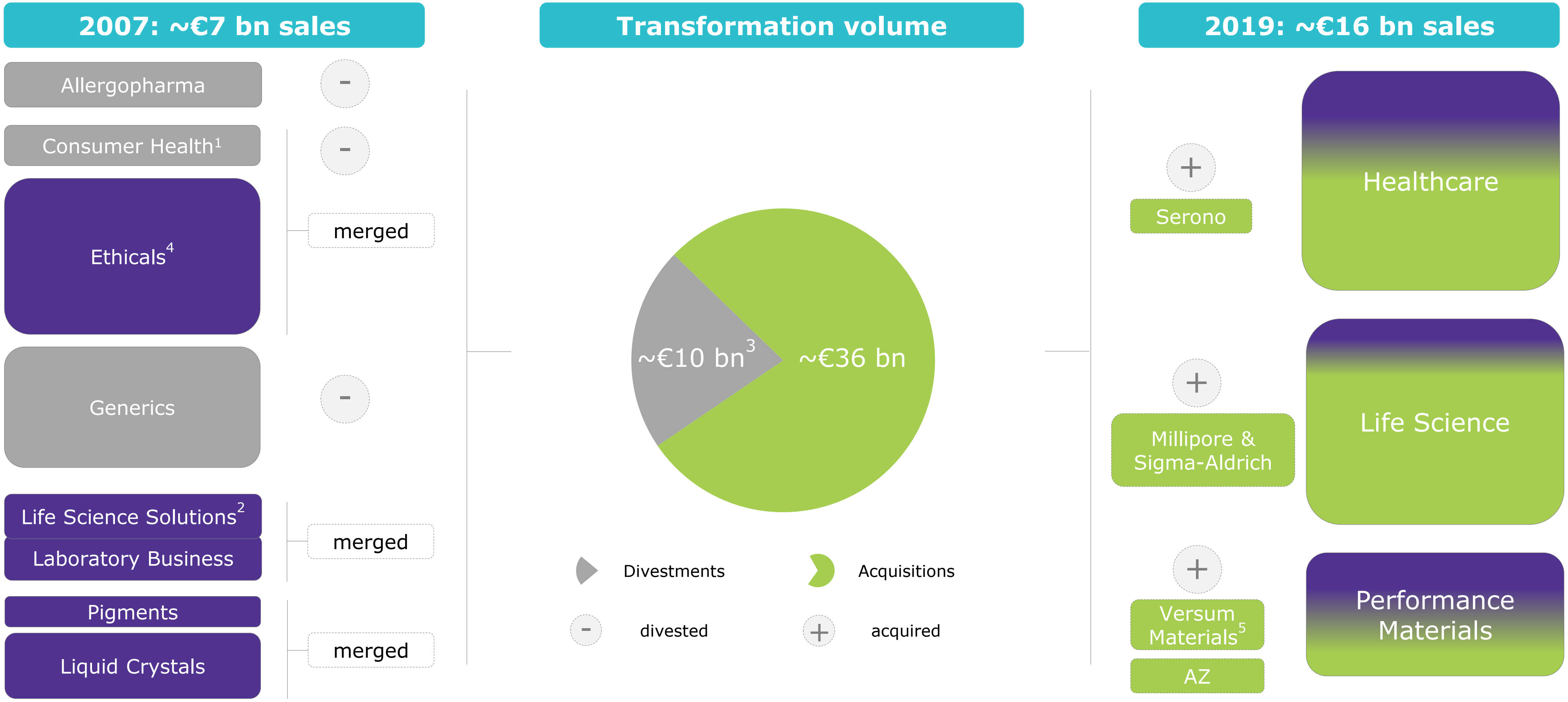
Acronym: VBP = volume based procurement

02

transforming the company

Group

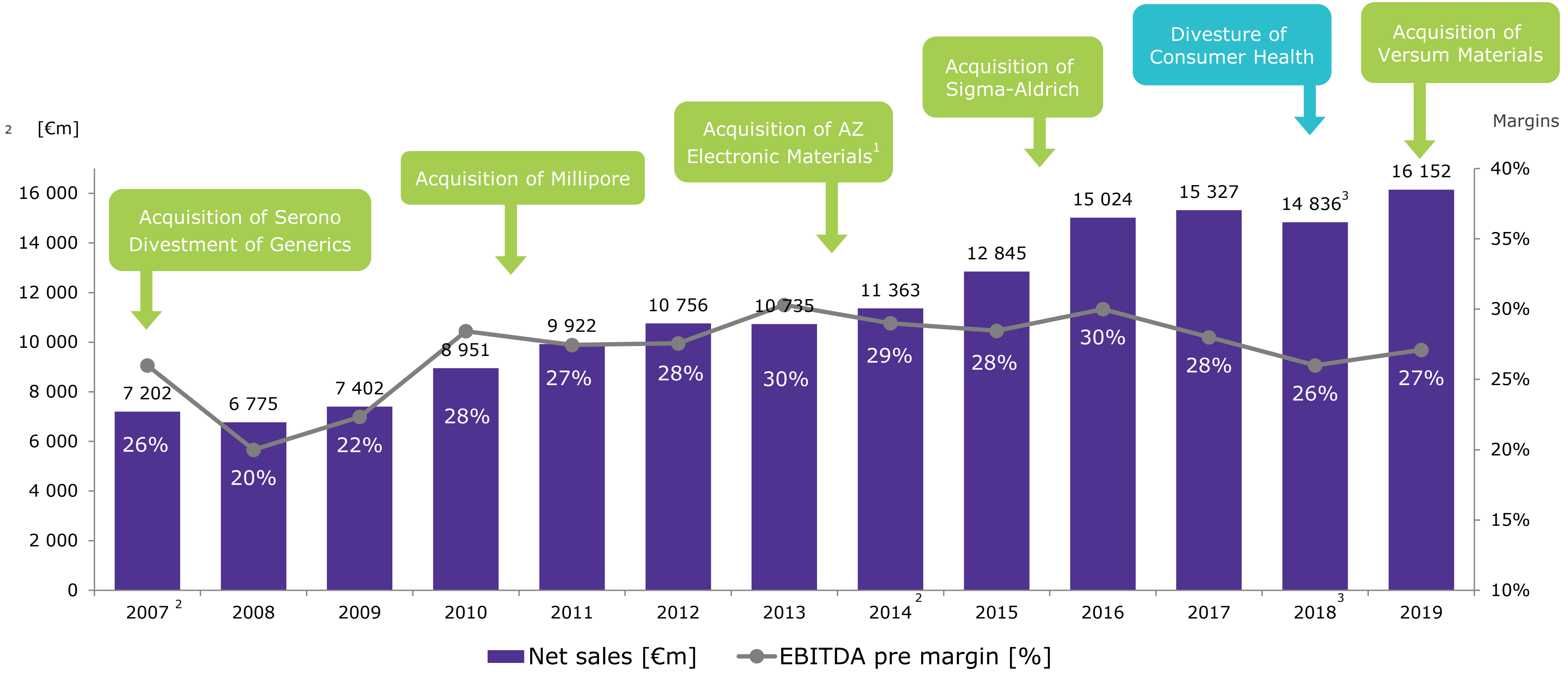
We have added scale and strengthened the attractiveness of our portfolio



[1]Closing of sale of Consumer Health at a cash purchase price of €3.4 bn completed as of December 1, 2018; [2]Excluding "Crop Bioscience", which was divested; [3]Profroma divestment volume includes cash proceeds for Consumer Health; [4]Excluding "Theramex", which was divested; [5]Closing of acquisition of Versum Materials at a purchase price of €5.8 bn completed as of October 7, 2019

Group

Continue to transform to a science and technology focused company



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

All three business sectors delivering on their strategic priorities

Healthcare

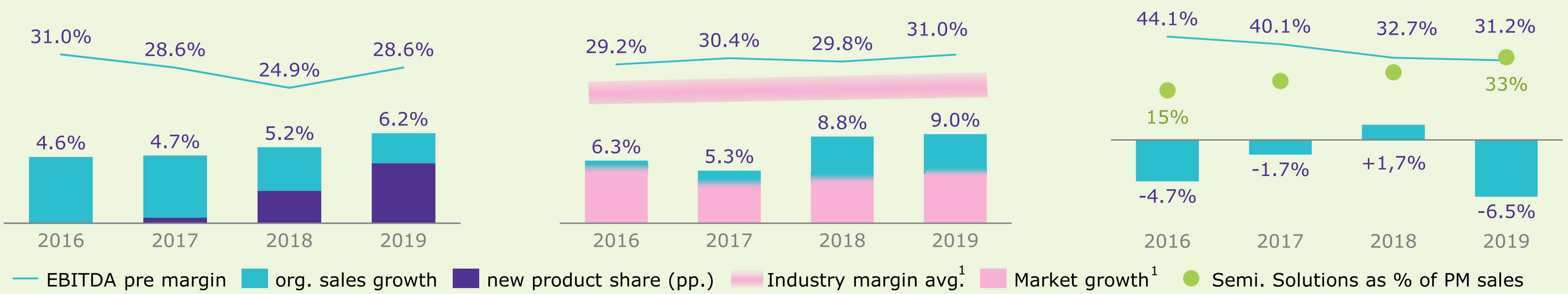
- **Accelerating organic growth** with rising contribution from launches (Mavenclad®, Bavencio®)
- **Margin trough behind**, **pipeline progressing** well

Life Science

- **Above-market organic growth** paired with **industry-leading margin**
- Significant **growth investments** (organic, inorganic & partnerships)

Performance Materials

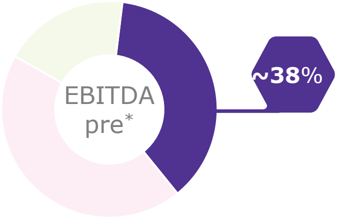
- Significant portfolio change **towards higher growth business** (Semi, OLED)
- **Margin stabilizing** at ~30% amid sound execution of Bright Future



[1] Company estimate based on industry data and reporting by peers

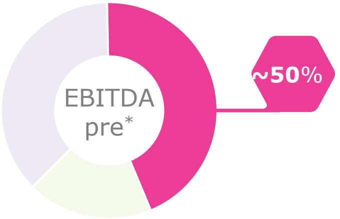
Clear set of priority goals

Healthcare



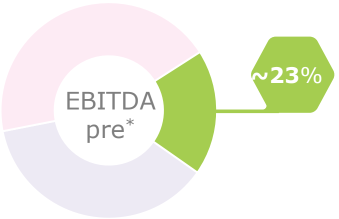
- Deliver on ambition to keep core business at least stable until 2022
- Transition from investment to earnings phase by 2019
- Foster successful Bavencio® and Mavenclad® ramp up
- Stringent pipeline execution

Life Science



- Strengthen position as differentiated player in a highly attractive market
- Maintain consistent above-market growth trajectory and superior profitability

Performance Materials



- Deliver ambition of 3-4% CAGR*
- Implement 5-year transformation program and focus on seamless integration of Versum and Intermolecular; to deliver financial ambition of around 30% margin
- Maintain strong cash generation and cash conversion

*based on H1 2020

Three-pillar structure – positioned to win in high-growth markets

Global economy[1]

Global GDP

~3% to 4%

End markets[1]

Global pharma industry
~4% to 5%

Global life science industry
~5% to 6%

Global electronics industry
~4%

Σ ~4% to 5%

Focus market areas[1]

Oncology: ~10%
Immunology: ~5% to 9%

Biologics: ~10% to 12%
Services: ~7% to 8%

Semi materials: ~4% to 6%

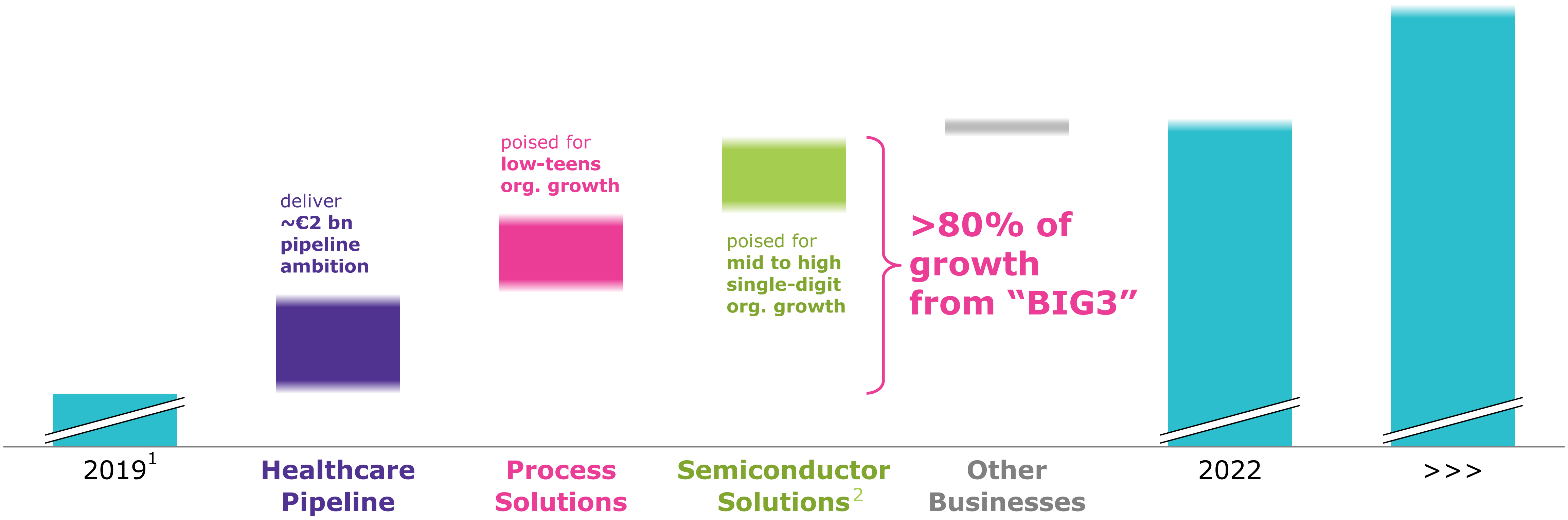
Σ 6%-plus

Purposefully positioned in attractive markets with secular growth above global GDP …further focusing investments on attractive sub-segments

[1] Company estimates of mid-term growth outlook based on industry forecasts and reports from public research institutes (e.g. IMF, IQVIA, EvaluatePharma, Prismark, etc.)

Group

Three main drivers of growth to 2022 and beyond



Beyond 2022: further significant growth potential from "BIG3" and increasing contributions from other businesses

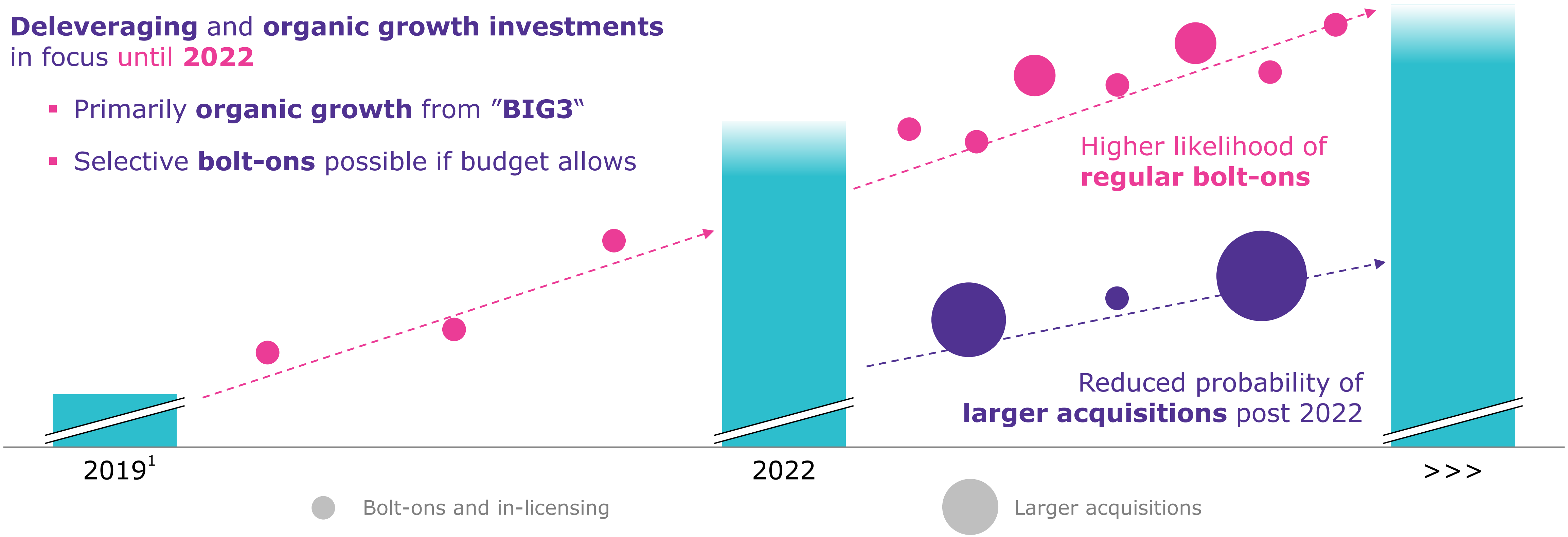
[1] 2019 Group sales of €16.2 bn; [2] Including Versum portfolio effect

Group

Portfolio strategy – from transformation to evolution

Deleveraging and **organic growth investments** in focus until **2022**

- Primarily **organic growth** from ”**BIG3**“
- Selective **bolt-ons** possible if budget allows



Strong portfolio: significant organic growth potential to 2022 and beyond …and higher likelihood of regular bolt-ons post 2022

[1] 2019 Group sales of €16.2 bn

03

Healthcare

Funding for success

Creating optionality through focused pipeline approach

Pipeline and launch progress supported by strong core

Pipeline quality

- Early stage pipeline fueled by **in-house innovation** ✓
- Potentially **transformative late-stage pipeline** assets (Evobrutinib, Bintrafusp alfa) ✓
- **Optimized risk profile** through strategic partnerships (Pfizer and GSK) and focused externalization ✓

Launch activity

- **Mavenclad®** approved in 80 countries including the U.S. ✓
- **Bavencio®** launched in MCC[1], RCC[2], and UC 1L/2L[3] ✓
- **Tepotinib** first-in-class approval of an oral MET inhibitor[4] ✓

Strong core business due to
excellent life cycle management

Mid-term outlook
Healthcare

~€2 bn
pipeline sales
& stable core business
until 2022
+
significant **growth potential**
beyond

More details at **R&D update call** on Sep 25

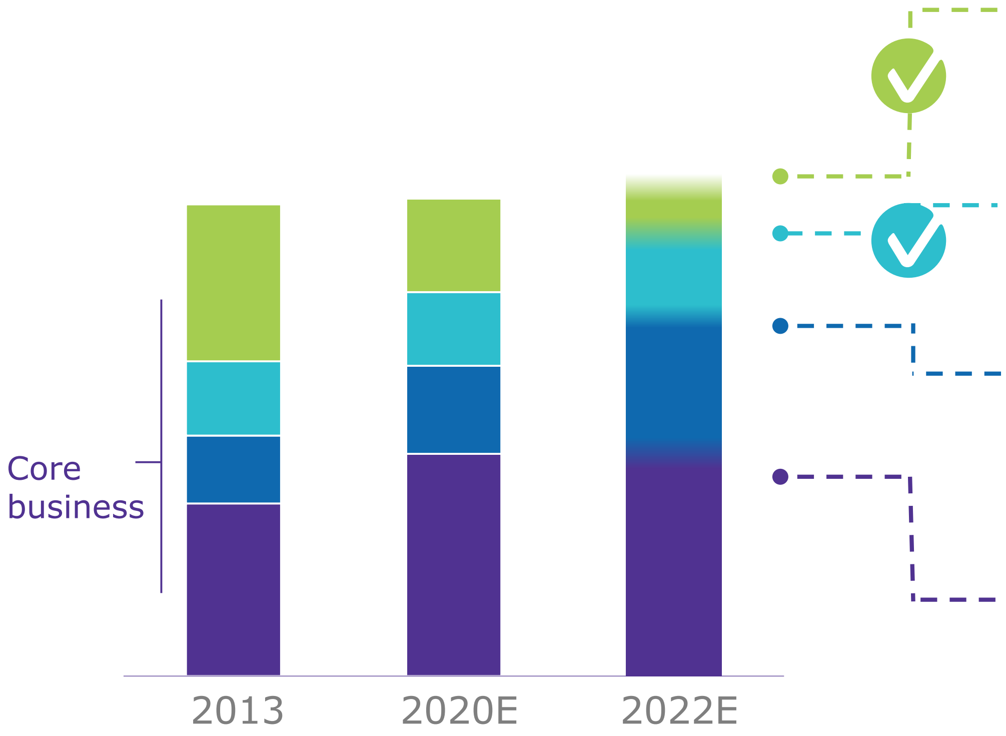
Confirming financial ambition of a **stable core business and ~€2 bn pipeline sales until 2022** with further significant **growth potential beyond**

[1] MCC = Merkel Cell Carcinoma, launched in all major jurisdictions; [2] RCC = Renal Cell Carcinoma, launched in all major jurisdictions; [3] UC = Urothelial Carcinoma, 1L = first line, 2L = second line, launched in the U.S., filed for approval in Europe and Japan; [4] approved in Japan for advanced NSCLC (non-small cell lung cancer), filed for approval in the U.S. under RTOR (Real-Time Oncology Review)

Healthcare

Confirming ambition to keep core business at least stable to 2022

Healthcare core business net sales until 2022



Rebif®
Decline in line with interferon market

- Maintain solid track record of patient retention
- Integrate into joint franchise with Mavenclad®
- Explore new treatment options (COVID-19)

Erbitux®
Stable to slightly growing

- Drive EM[1] growth and mitigate competitive / price pressure in EU by clear branding
- Expect continued inclusion in China's NRDL post update at the end of 2020

Fertility
Recovery as of mid 2020, mid single-digit growth beyond 2021

- Drug demand driven by emerging markets growth and demographics
- Leverage competitive strengths (e.g. broad and innovative portfolio, security of supply)
- Drive recovery after COVID-19

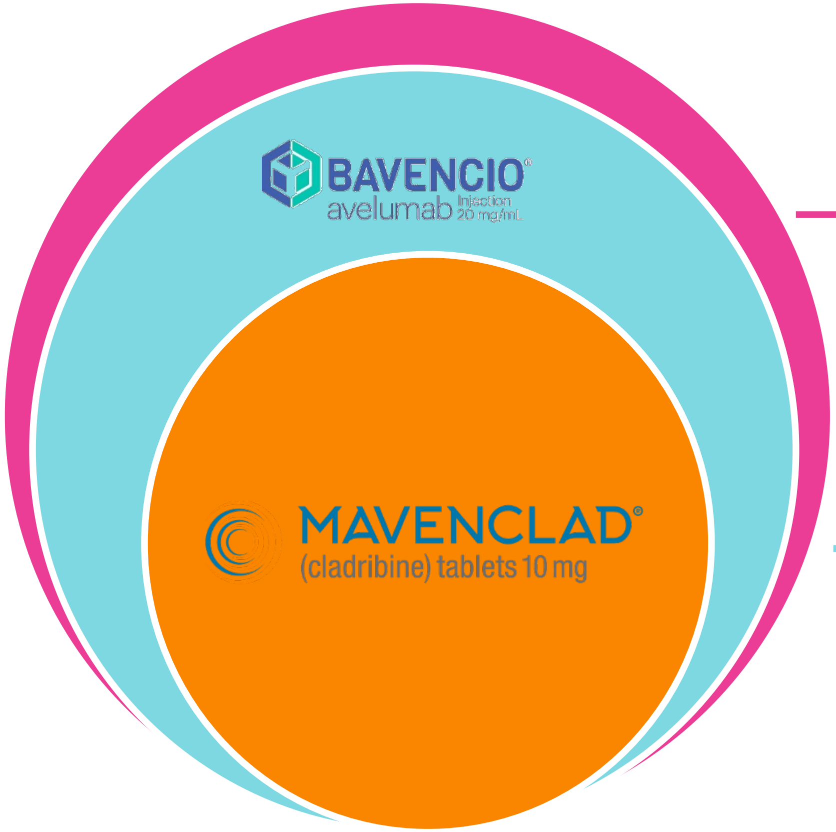
General Medicine[2]
Stable in 2021, mid to high single-digit growth beyond

- Increasing prevalence of diabetes and cardiovascular diseases
- Mitigate VBP pressure in China through EM growth, effective life cycle management, and portfolio expansion

Core business with **36 consecutive quarters of growth** (Q2 2011 – Q1 2020)
Growth to **pick up after COVID-19 impact** in Q2 2020, further **growth potential after 2022**

[1] EM: emerging markets; [2] includes General Medicine, CardioMetabolic Care (CMC) and Endocrinology

Mavenclad and Bavencio launches on track for ~€2 bn pipeline ambition in 2022



Tepotinib

- Approved in Japan on March 25, 2020 (Sakigake and ODD granted in 2018 & 2019)
- Filing accepted by US FDA on August 25, 2020 (granted priority review under RTOR)

Bintrafusp alfa

- Multiple potentially registrational studies across various tumor types ongoing
- First data read-outs expected in early 2021

Bavencio®

- Approved for aRCC (USA, EU, Japan), mMCC (50 countries incl. USA and EU), and UC 2L (USA, Canada, Israel)
- UC 1L: Approved by FDA on June 30, 2020; Application accepted by EMA and Japanese MHLW in June 2020
- Phase III read-out remaining: NSCLC 1L

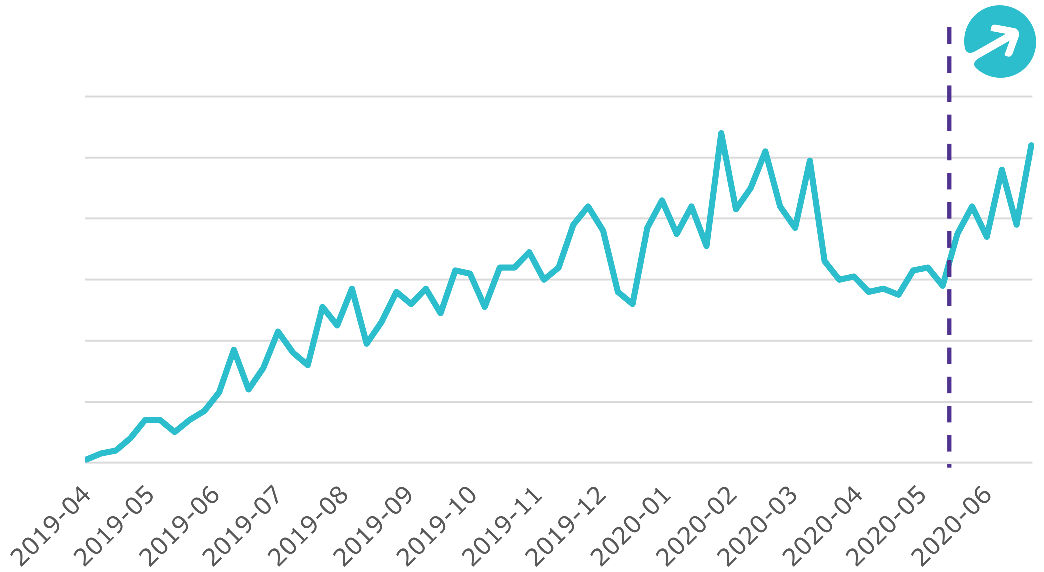
Mavenclad®

- Global peak sales: €1.0–1.4 bn
- Approved in 80 countries, including USA, EU, Canada and Australia
- Global launch continuing to make progress
- Recovery from peak COVID impact visible as of June

ILLUSTRATIVE - Not to scale;
Acronyms: BTD = Breakthrough Designation; ODD = Orphan Drug Designation; IA = Interim Analysis; RTOR = Real-Time Oncology Review; sBLA = Supplemental Biologics License Application

Mavenclad® – Global launch continues to make progress, with recovery of ramp-up from peak COVID impact visible starting in June 2020

US Mavenclad® TRx,
[IQVIA, NPA, weekly view]



- Approved in **80 countries**
- **Impact of COVID:**
  - **Restricted HCP access** and forced pivot to digital engagement only; **treatment guidelines** restricting use of products
  - Significant decline of patient consults with neurologists, leading to fewer treatment initiations and fewer treatment switches (**dynamic market temporarily depressed**)
- **Recovery:**
  - **US: Continuing to gain market share** in dynamic High Efficacy (6.7%) and dynamic Oral classes (9.7%)[1]
  - **Ex-US: Recovery as of June**, dynamic HE market share defended despite COVID 19, pre-COVID prescribers have reinitiated patients on Mavenclad®

1: Dynamic High Efficacy (HE) market describes share of patients starting on/switching to HE treatments; Source: IQVIA, 17th July 2020

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Catalysts – 2020 characterized by significant developmental progress across all therapeutic areas

Q2 2020	H2 2020 (R&D Update Call: September 25)	H1 2021
Tepotinib (c-Met–inhibitor)		
METex14: Filing accepted by US FDA in August (granted priority review under RTOR) ✓		
Bavencio® (Avelumab/Anti-PD-L1)		
1L UC: U.S. FDA approval on June 30, EMA validation of filing on June 22, & acceptance of supplemental new drug application by the Japanese MHLW ✓	• 1L UC: Subgroup analyses to be presented at ESMO (September 19) • 1L RCC: NICE recommendation published on July 31 ✓	• 1L UC: Expected regulatory feedback from EMA and Japanese MHLW • 1L NSCLC: Expected in-house availability of Ph III data
	Bintrafusp alfa (Anti-PD-L1/TGF-ß-Trap)	
	Initiation of additional studies beyond NSCLC: 2L UC (Ph Ib, monotherapy), solid tumors (Ph I, bintrafusp alfa + M6223 (TIGIT inhibitor)), 2L TNBC (Ph II, monotherapy) recently posted on ct.gov	
Evobrutinib (BTK-inhibitor)		2L BTC: Expected data read-out
RMS: Recruitment initiation (Ph III) ✓		
M5049 (TLR7/8 antagonist)		
Initiation of trial for severe symptoms of Covid-19 infection (Ph II) ✓	Results from Ph II expected end of 2020	

Oncology
Neurology
Immuno-Oncology
Immunology

Acronyms: BTC = Biliary Tract Cancer, BTD = Breakthrough Therapy Designation, EMA = European Medicines Agency, FDA = U.S. Food and Drug Administration, MHLW = Ministry of Health, Labour and Welfare, NEJM = New England Journal of Medicine, NICE = UK National Institute for Health and Care Excellence, NSCLC = Non-Small Cell Lung Cancer, RMS = Relapsing Multiple Sclerosis, RTOR = Real-Time Oncology Review, TGIT = T cell immunoreceptor with Ig and ITIM domains, UC = Urothelial Cancer

Life science

Focusing on profitable growth

04

Building growth momentum with focus on attractive market segments

Total Life Science Market[1]
~€170-180 bn; ~5-6% CAGR

Mid-term outlook
Life Science

	Research ~30%; ~2-3%	Process ~35%; ~8-9%	Applied ~35%; ~4-5%
Consumables ~55%; ~5-6%	strong	strong	strong
Instruments ~15%; ~4-5%	limited	strong	limited
Services ~30%; ~7-8%	limited	moderate	limited

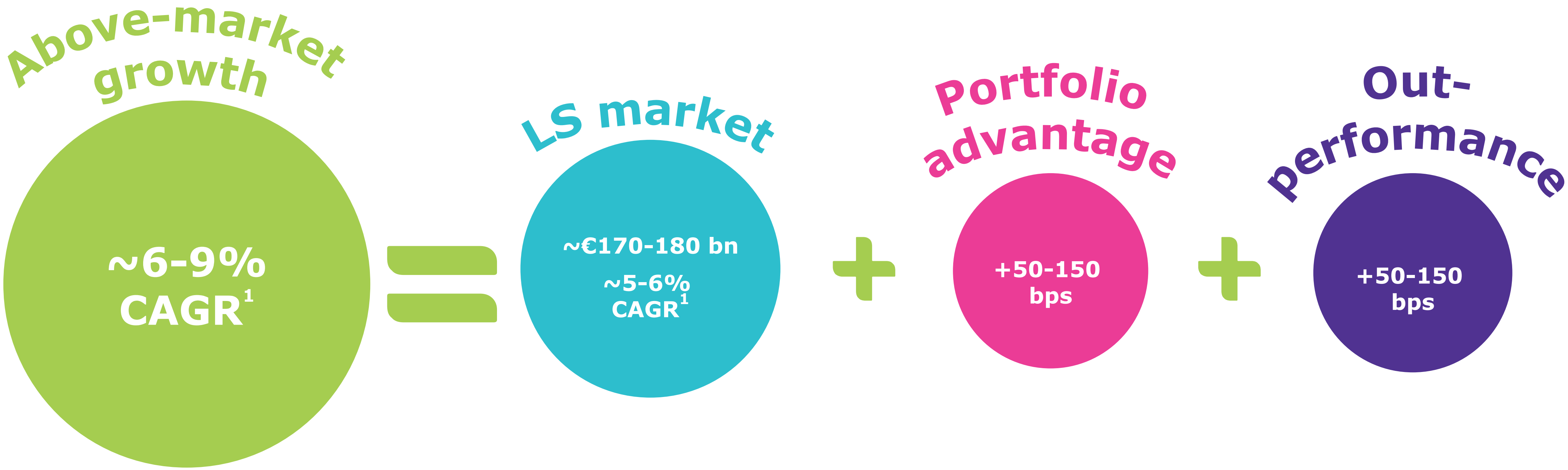
Groups's market presence: strong, moderate, limited

6-9%
Organic sales CAGR

Upgrading mid-term financial ambition **to 6-9% organic sales CAGR**

[1] Company estimate based on industry forecast over 5-year horizon

Improved mid-term outlook driven by market and portfolio focus

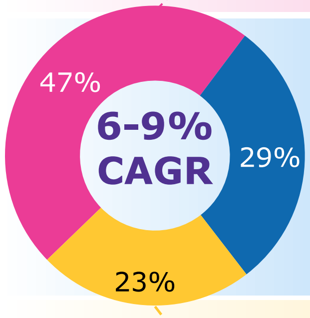


- **Market outlook improving** further, mainly due to **Process** segment
- **Above-market growth set to continue** due to **portfolio advantage** and **outperformance**

[1] Company estimate based on industry forecast over 5-year horizon

All business units contributing to above-market growth

Sales split[1]



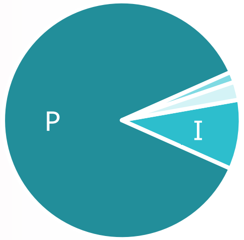
Mid-term outlook[2]

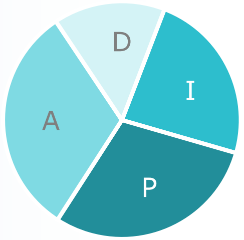
Process Solutions
Low-teens growth
vs. market of 8-9%

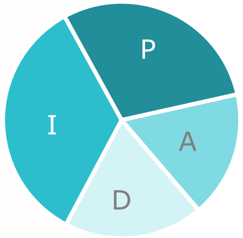
Research Solutions
Low single-digit growth
vs. market of 2-3%

Applied Solutions
Mid single-digit growth
vs. market of 4-5%

Customer Split[3]







Fundamental growth drivers

- **Biologics:** global mAbs[4] production growing by ~11-15% p.a. for 2020-2024[5] driven by new molecules and biosimilars
- **Diversification:** contribution by top 10 molecules will decline to ~30% until 2024 from ~50% in 2020[6]
- **Novel modalities:** cell & gene therapy market with >30% CAGR 2020-2024[5], complex delivery drives demand for services and viral vectors

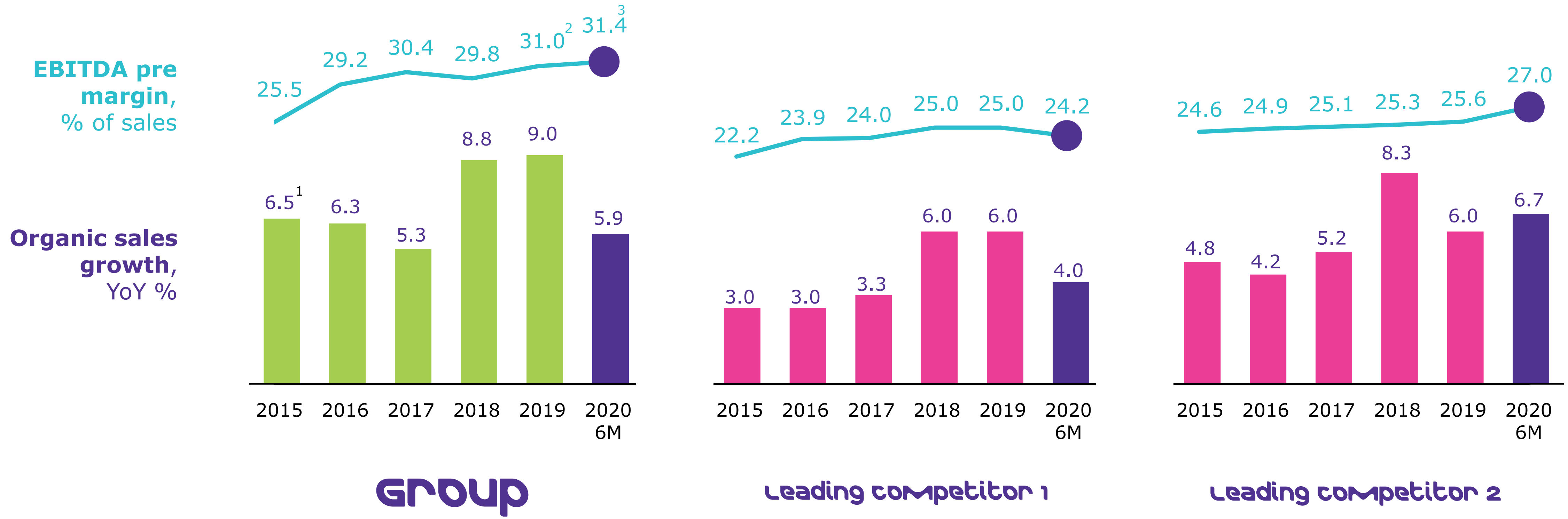
- **Research activity:** >9,000 pre-clinical projects in research pipelines[7]; rising number of experiments backs healthy growth in biotechs/CROs[8]
- **Public and private funding:** availability, access and predictability drive demand from academia and emerging biotechs
- **Emerging technologies:** high growth technologies for drug discovery and development, e.g. advanced cell culture and AI drug discovery

- **Regulation:** rise in quality standards and increasing 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

Customer Segments: P Pharma and Biotech | I Industrial and Testing | A Academia | D Diagnostics

[1] Based on H1 2020, CAGR is organic mid-term ambition; [2] growth rates are organic CAGRs; [3] indicative only; [4] mAbs = monoclonal antibodies; [5] Source: company estimate based on industry forecasts; [6] Source: EvaluatePharma; [7] Source: statista; [8] CRO = Contract Research Organization

Continuing to set the benchmark for industry performance

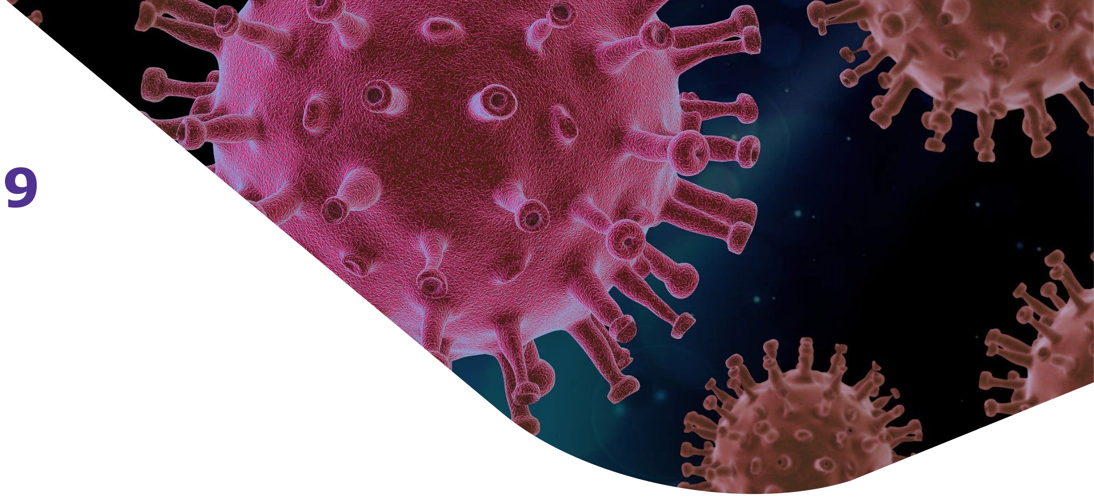


Objective

- Grow **above market**
- Sustain **leading market position**

[1] 6.5% for EMD Millipore; 6.0% for SIAL calculated from first 9 months of 2015; [2] including IFRS16 benefit of 80bps; [3] all margins excl. Corporate & Others

Critical offering in the fight against COVID-19



products feed into...

www.sigmaaldrich.com/covid-19

VIRUS **DETECTION**

- Leading critical component provider for Molecular and Serological diagnostic kits
- PCR reagents, kits and tools for all stages of assay development

VIRUS **CHARACTERIZATION**

- Offering is among largest biologic reagents and hardware portfolios
- Effective vaccines and therapies start with reliable virus characterization
- Highest quality reagents needed for understanding of viral attachment, genomics, or proteomics

VACCINE & THERAPY **PRODUCTION**

- Supporting global COVID-19 vaccine and therapy response effort:
  - Upstream and downstream research and scaling
  - End-to-End solutions
  - Biosafety Testing Services

05

performance materials

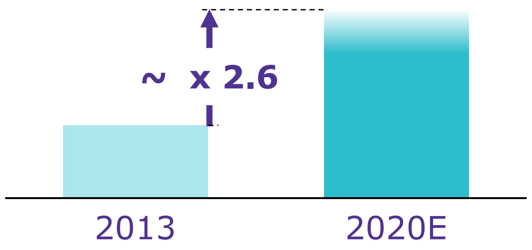
Maintaining leadership and innovation

Performance Materials

Electronics focus leads to greater resilience and accelerated growth

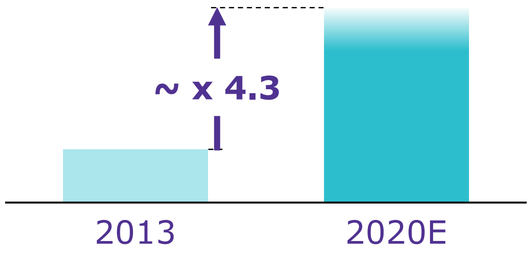
of customers

[that make up 80% of Sales]



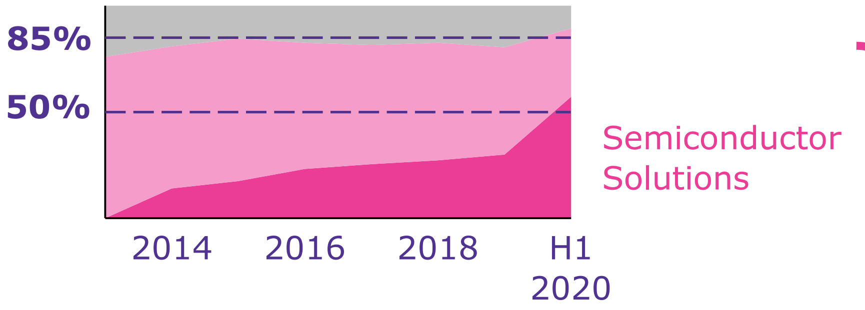
of product groups

[that make up 80% of Sales]



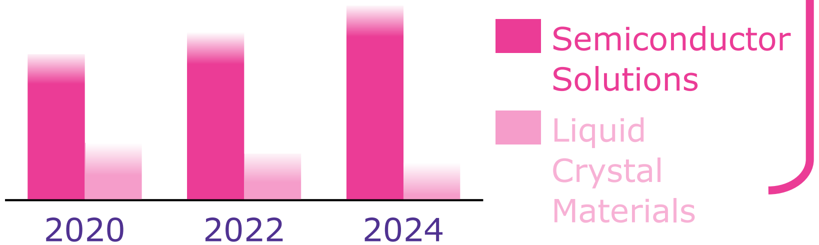
Performance Materials sales split

[% of total]



Semi vs. Liquid Crystals

[illustrative anticipated sales development]



Mid-term outlook

Performance Materials

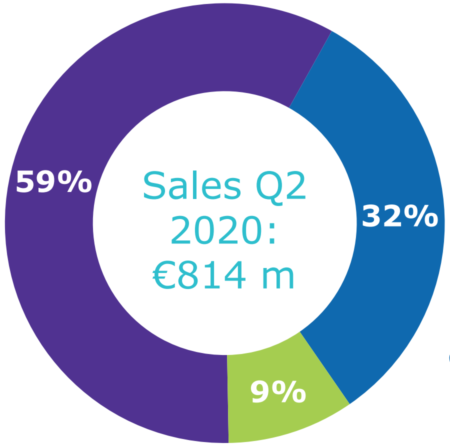
3-4%

organic sales

CAGR

Updating mid-term financial ambition **to 3-4% organic sales CAGR**

Performance Materials refocus on electronics drives mid-term guidance upgrade: 3 to 4% CAGR overall



Mid term outlook

Semiconductor solutions

Mid- to high single-digit growth

- Continued market growth due to technological advances (Artificial intelligence, 5G, Big Data and cloud, Internet of Things) serving customers in **Logic, Memory, Packaging and others**
- 4 to 6% market growth[1]
- 200 to 300bps above-market growth from share gains & better portfolio (incl. 100 to 150bps additional growth from integration top-line synergies)

Display solutions

Low single-digit decline

- Driven by trend to **bigger TV size, higher resolutions, more mobile devices**
- 3 to 4% growth of total LCD m² area[2], while price pressure continues
- 18 to 22% growth of total OLED m² area[2] with slight to moderate market share gains
- OLED material market to exceed LC material market by 2022[3]

Surface solutions

Low single-digit growth

- Well balanced exposure to **automotive** and **cosmetics** end market
- Drivers: rising living standards, higher disposable income in growing markets and increasing demand for high value products at reasonable prices
- Light vehicle production and relevant cosmetics end markets returning to growth in 2021 and reaching 2019 levels by 2022 and beyond[4]

[1]Source: Jan 2020 IC Insights 2018-2024 CAGR for wafer starts in million units; [2] Source: Omdia Display Market Outlook, Q1 2020; [3]Internal Business Intelligence; [4] Sources: LMC Automotive Light Vehicles Forecast, Aug 2020 & Euromonitor BPC (Beauty & Personal Care) Aug 2020

Performance Materials

5-year transformation program Bright Future is well on track

2018 | 2019 | 2020 | 2021 | 2022+

Back to organic growth → 3-4% CAGR[1]

Resource allocation & process excellence → ~30% Margin

- Site closures in Atsugi, Japan (2021) and Chilworth, UK (2019) announced
- Outsourcing progressing; reduction of LC production capacity in Darmstadt until 2022 announced
- Cost saving measures ahead of plan; target of approx. 500 FTE worldwide until 2022

Portfolio management

- Acquisition of Versum Materials and Intermolecular successfully closed

Cultural change

- Significant changes in composition of leadership team
- Cultural change addressed in three dedicated initiatives focused on customer centricity, market-driven innovation and corporate culture

[1] New mid-term CAGR guidance starting 2020

Performance Materials
Strategic roadmap materializing

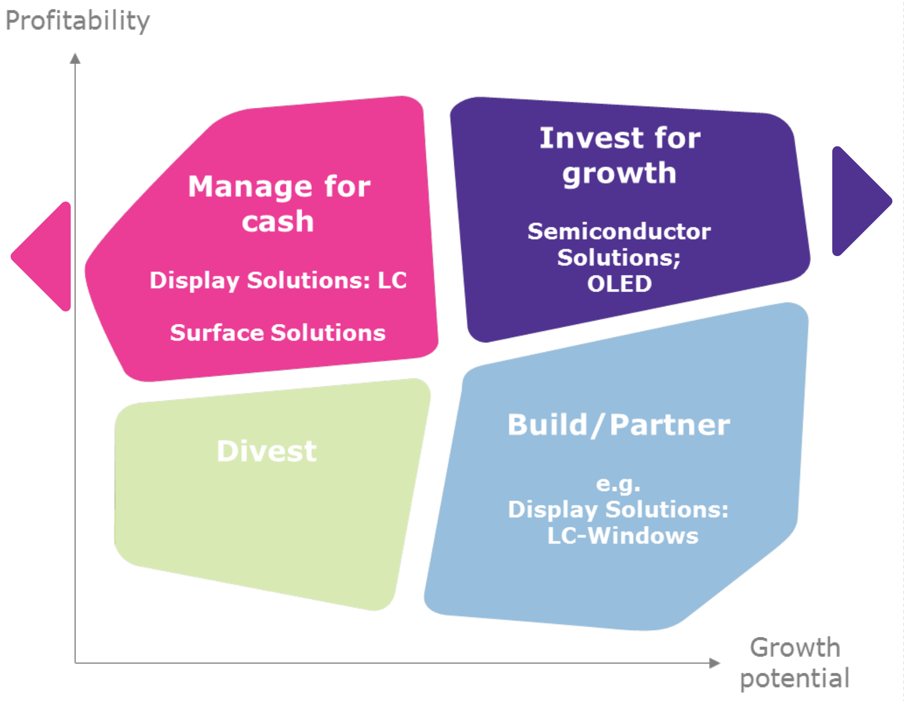
Measures for a bright future

Darmstadt
- In Darmstadt focus on R&D and production
- Immediate bottom line contribution from 2019 onwards
- Reduce the number of FTEs by ~15% = ~400 FTEs

Chilworth
- Chilworth site during September 2019 successfully closed

Atsugi
- Shut down of Performance Materials activities at Atsugi site started (to be completed during 2021)
- R&D and production activities in Atsugi transferred and consolidated in other PM locations in Asia
- Consolidation of site structure in Japan

Bottom-line management to support margin ambition of 30% in the long-term



VERSUM MATERIALS

- Leading supplier of high-purity process chemicals, gases and equipment serving semiconductor manufacturers
- Track record of accelerated growth and industry leading profitability
- ➢ Creating a **leading electronic materials player** with **attractive long-term prospect**

INTERMOLECULAR®

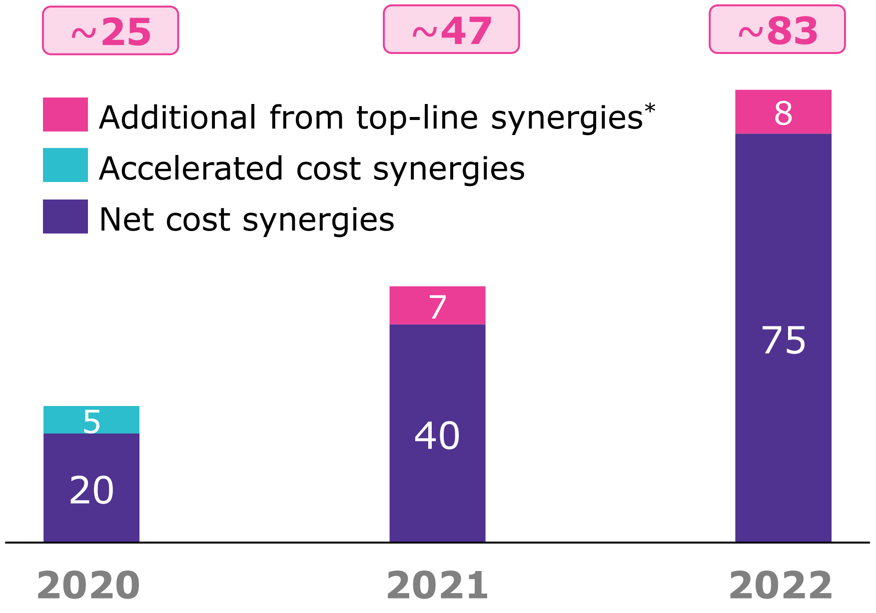
- Leading in advanced materials innovation
- Acquisition to strengthen semiconductor technology offering
- ➢ Application specific **materials expertise with** that **perfectly complement** Group's business and technology portfolio

Both transactions successfully closed

Performance Materials

Synergy upgrade driven by fast 2020 execution and top-line synergies

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



Synergy upgrade of ~10% confirms strong integration capabilities

Sources of synergies

Business optimization

- Transform country setup
- Streamline duplicate structures

Procurement and supply chain

- Optimize production and supply chain network
- Achieve savings through joint procurement

Corporate and administrative functions

- Integrate corporate & administrative functions
- Cost savings due to U.S. company delistings

*Top-line synergies from cross-selling, new products introductions and overarching initiatives

06

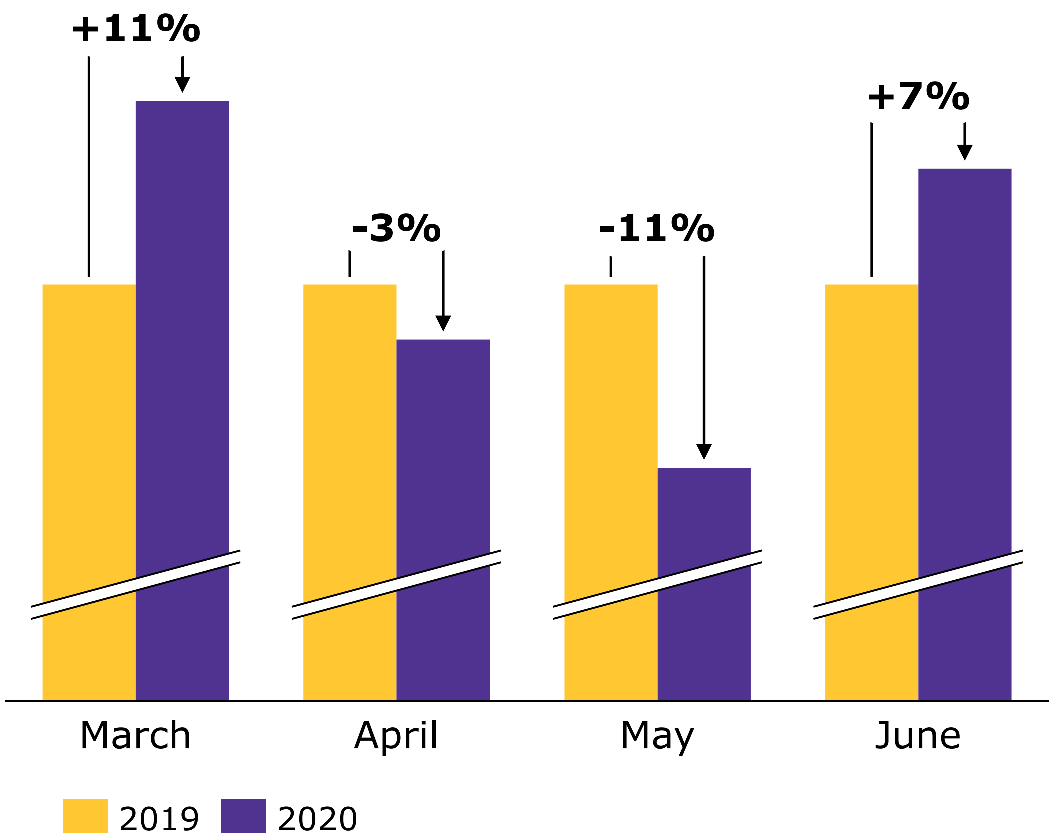
executive summary and guidance

Our assumptions on the development of the COVID-19 pandemic have remained largely the same since May

Previous assumptions (communicated in May)	Current assumptions (communicated in August)
Impact **across all regions**	✓ Impact **across all regions**
Cases expected to **peak in Q2** Situation **eases in H2** Pandemic crisis **lasts for FY**	✓ **Recovery progressing** during H2
Stressed health systems Some countries have **less effective** response than China	✓ Some countries **struggle to contain** virus resulting in stressed health systems Effective **vaccines** not broadly available
However, **no major resurgences**	✓ Additional flares, but **not triggering new widespread lockdowns**

Active crisis management and resilient product portfolio allowed quick 8-week recovery time

Organic sales growth - Group



Increased visibility of COVID-19 impact

- Strongest correlation with mandatory **workplace closures**
  - **Fertility**: closure of clinics
  - **N&I**: closure of practices, limited visits
  - **Research Solution**: closure of research labs
  - **Display Solutions**: closure of electronic retail
- **Merck KGaA, Darmstadt, Germany, well positioned in essential industries:**
  - Governments moved from mandatory **workplace closures** to mandatory **workplace measures**
  - Immediate restoration of business
- Other changes of a longer-lasting nature (Display or Automotive end markets)

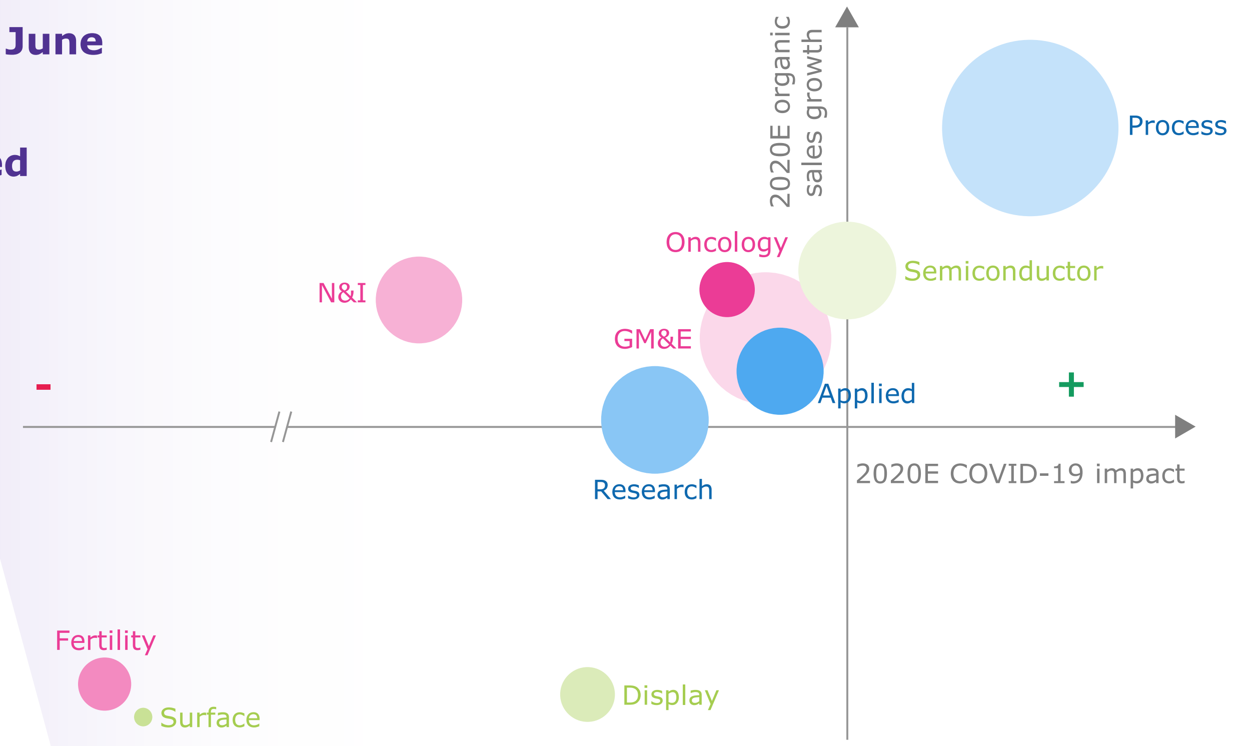
2020 – strong resilience in times of global crisis

- **2020 guidance confirmed; recovery started in June**
- **Most businesses growing** despite COVID-19
- **Largest business** growing and **positively affected**
- Smallest businesses with biggest impact

Delivery on priorities during crisis

- ✓ **Health & safety of employees**
- ✓ **Business continuity**
- ✓ **Contributions to public health and society**
- ✓ **Sustainability aspects further enforced**

Growth and COVID-19 impact by business[1]



CMD 2019

Merck KGaA, Darmstadt, Germany - steady earnings growth with high margins and a low risk profile

[1] Indicative only and based on guidance from August 6: slight to moderate organic sales and EBITDA pre growth, COVID-19 with up to a mid single-digit impact on sales of which 50-60% hitting EBITDA pre

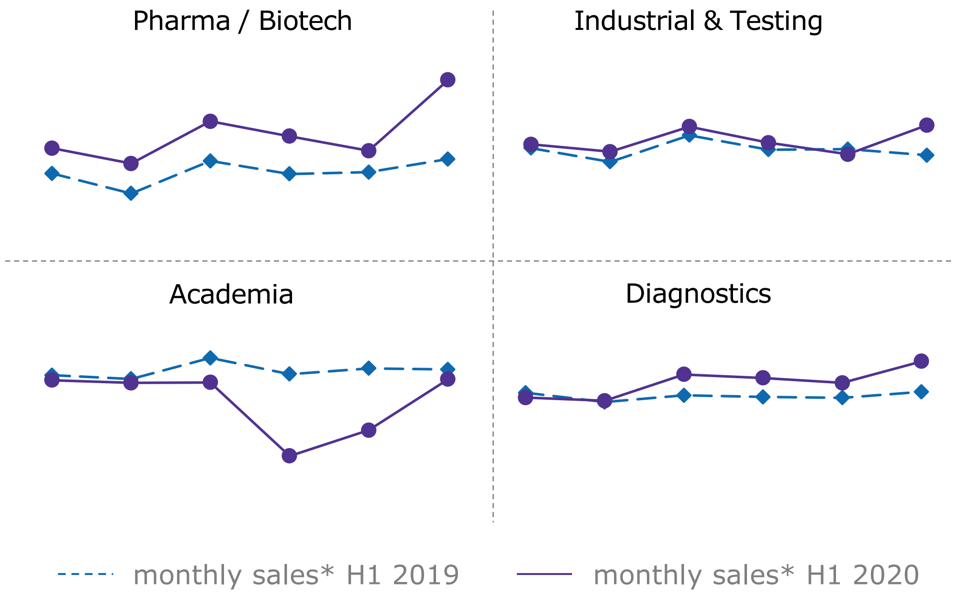
Life Science highly resilient and well positioned to participate in potential mid-term upside from COVID-19

2020 heatmap of COVID-19 impact by customer segment

	Pharma/ Biotech	Industrial & Testing	Academia	Diagnostics
Process Solutions	+ + + −	COVID-19 insensitive	COVID-19 insensitive	COVID-19 insensitive
Research Solutions	+	COVID-19 insensitive	− − −	+ + −
Applied Solutions	+ −	+ −	− −	+

\+ upsides from COVID-19 − downsides from COVID-19

H1 2020 monthly sales* by customer segment



* llustrative;
to scale only within each customer segment

- Mid-term: **downsides to fade**, some **upsides to stay**, recovery started in June
- Order book for Process Solutions **up by >40%,** capacity expansion underway

COVID-19 guidance given in May overall accurate, improved visibility warrants slight upgrade

Group:

- **Up to** mid single-digit percentage sales impact full year
- **Countermeasures in place:** confirm 50 to 60% of net sales impact to hit EBITDA pre
- **Recovery visible** in June, **expected to continue** in Q3 and Q4

Healthcare assumptions:

- Biggest impact in Fertility behind, as **clinics are opening up again**
- Mavenclad® **recovery visible in June**
- Other businesses **normalizing**

Life Science assumptions:

- **Net upside** from COVID-19-related demand in Process Solutions
- **Recovery as of June** in Applied Solutions
- **Research** showed **largest impact**, recovering in June as well

Performance Materials assumptions:

- **Strong growth** in Semiconductor expected to continue despite COVID-19
- Some **ease of impact** from COVID-19 in Display **versus Q2**
- Slight **ease on Surface's end markets** expected **versus Q2**

Group

Full-year 2020 guidance

Net sales:
Slight to moderate organic growth, Versum growth contribution in mid single-digit percentage range;
FX between 0% to -2% YoY;
~€16.9 – 17.7 bn

EBITDA pre:
Slight to moderate organic growth, mid single-digit percentage range growth from Versum;
FX headwinds of -2% to -4% YoY;
~€4,450 – 4,850 m

EPS pre:
~€5.60 – 6.25

executive summary

steady earnings growth with high margins and a low risk profile

group

Successfully driving **transformation into a leading science and technology company**

setup

Three-pillar structure strengthened further as a resilient basis; COVID-19 crisis as another proof point

growth engines

Healthcare pipeline, Process Solutions and Semiconductor Solutions will be key drivers of growth to 2022 and beyond

execution

Delivery on strategic priorities ensures profitable growth; regaining financial flexibility with higher likelihood of regular bolt-ons post 2022

Group

2020 business sector guidance[1]

Healthcare

Net sales

- Slight organic growth
- COVID-19 significantly impacting Fertility performance
- Sustained performance of new products

EBITDA pre

- Organically about stable
- Significant adverse FX impact

Life Science

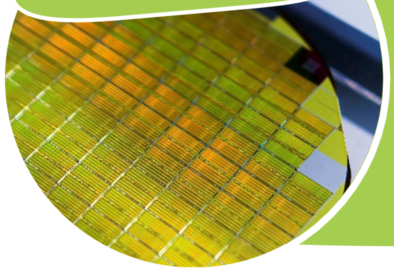
Net sales

- Strong organic growth
- Process Solutions trend offsetting slowdown in Research and Applied Solutions

EBITDA pre

- Strong organic growth
- Moderate adverse FX impact

Performance Materials



Net sales

- Moderate to strong organic decline
- Semiconductor Solutions growing strongly, while COVID-19 weighing on Display and Surface
- Mid-thirties percentage contribution from Versum

EBITDA pre

- Organic decline in the low-teens %
- Slight support from FX
- Mid-thirties percentage contribution from Versum

[1]Business Sector guidances are only support to the Group guidance and do not have to add up

Additional financial guidance 2020

Further financial details

Corporate & Other EBITDA pre	**slightly lower than last year**
Interest result	**~-280 to -310 m**
Effective tax rate	**~24% to 26%**
Capex on PPE	**~1.1 bn to 1.2 bn**
Hedging/USD assumption	**FY 2020 hedge ratio ~65% at EUR/USD ~1.16**
2020 Ø EUR/USD assumption	**~1.09 to 1.13**

Group

Key earnings drivers to remember for 2021

EBITDA pre - supporting factors	EBITDA pre - reducing factors
Increasing Mavenclad® & Bavencio® contribution	Glucophage impacted by VBP in China
Ongoing strength in Life Science with above-market organic sales growth	Continued decline of liquid crystals and Rebif®
Continued strong outlook in Semiconductor Solutions with above-market organic sales growth	
High level of cost consciousness (e.g. M&S and R&D in Healthcare to further decrease as % of sales)	
Potential milestone payments (e.g. Bavencio®)	

Discipline and prioritization will be key ingredients to deliver

Focus on organic growth and deleveraging to 2022

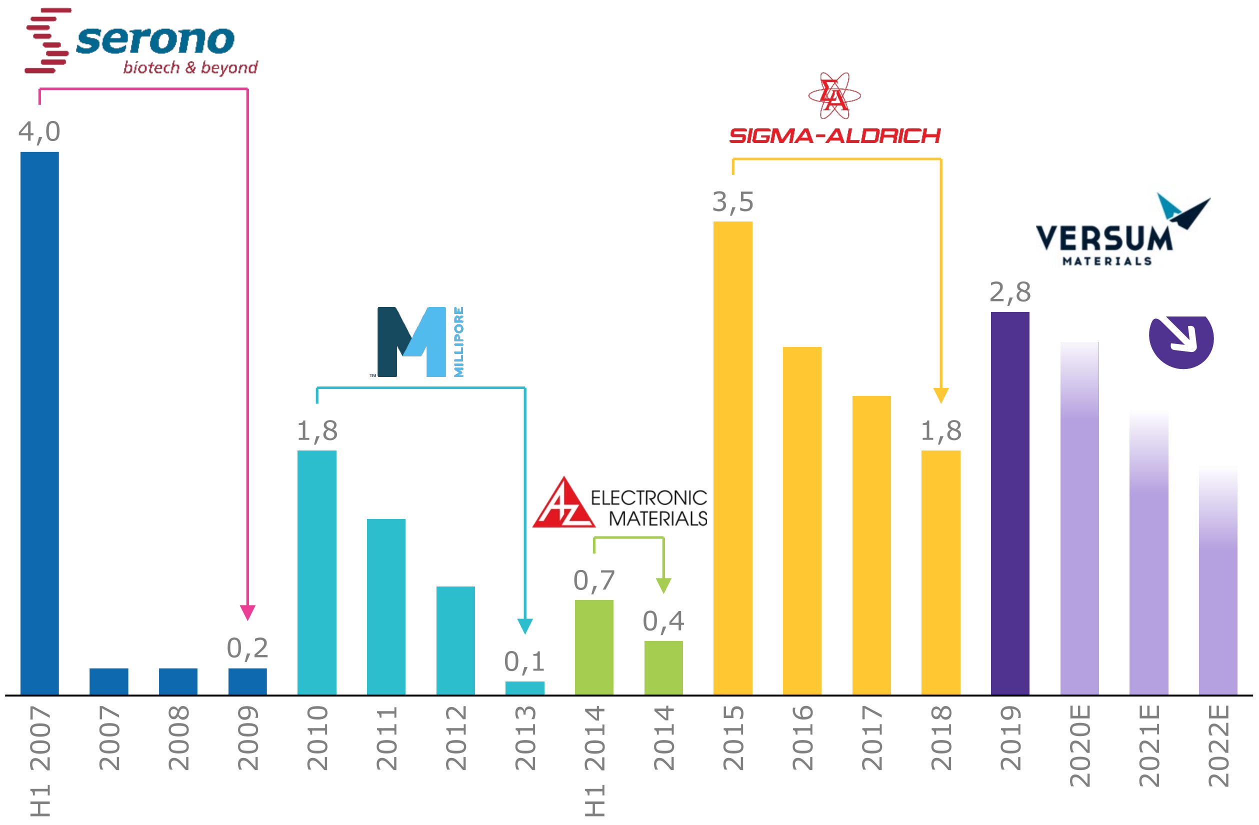
Proven swift deleveraging
after major acquisitions

UPDATE

- **Deleverage to <2x** net debt/EBITDA pre in 2022
- **M&A on hold until 2022**; only smaller deals to be realized if budget available
- New mid-term capex ceiling of ~€1.3 bn reflects **increased focus on organic investment** and Versum consolidation

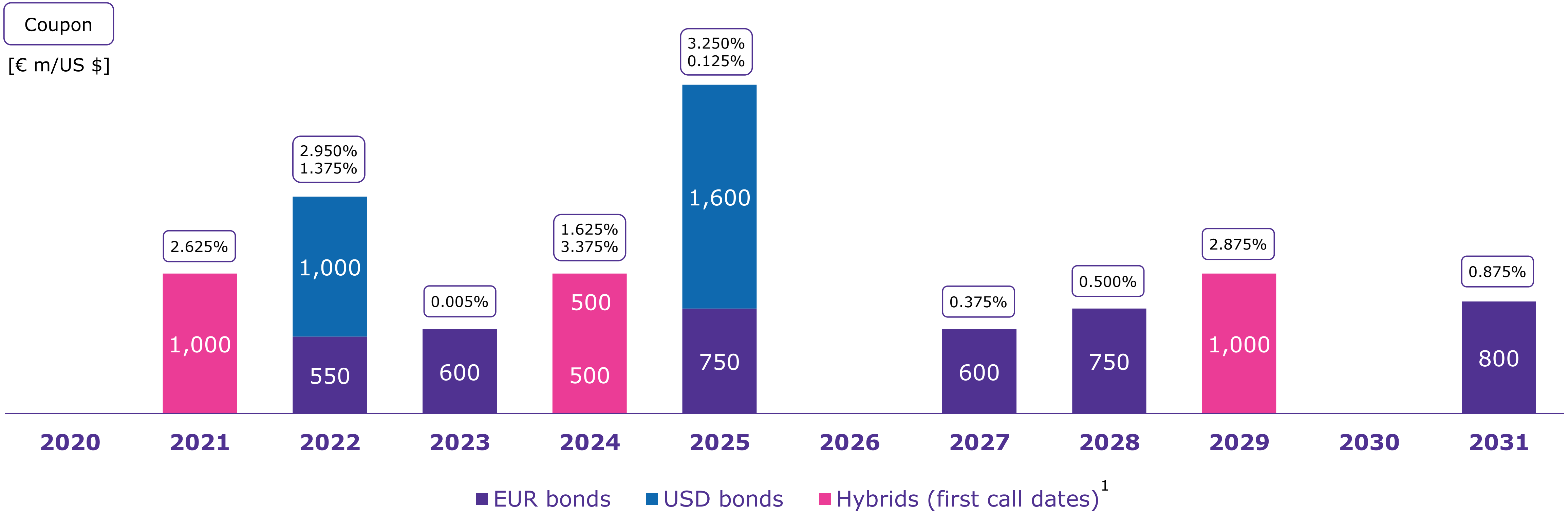
- Dividend policy mirrors **sustainable earnings trend**

Net debt / EBITDA pre track record & outlook



Maturity profile reflects Sigma-Aldrich and Versum financing transactions

Maturity profile as of June 30, 2020



Balanced maturity profile in upcoming years avoids refinancing risks; Merck KGaA, Darmstadt, Germany, will become a more frequent issuer

1 - No decision on call rights taken yet
Totals may not add up due to rounding

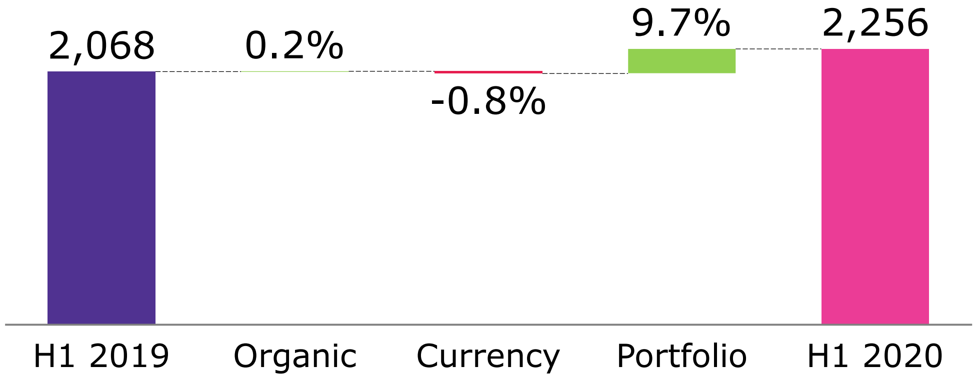
A strong Q1 and double-digit Q2 growth in Process Solutions and Semiconductor Solutions allow for overall organic growth in H1

H1 YoY Net Sales

	Organic	Currency	Portfolio	Total
Healthcare	3.2%	-1.4%	-0.5%	1.3%
Life Science	5.9%	0.2%	0.0%	6.2%
Performance Materials	-9.5%	2.1%	51.1%	43.7%
Group	**2.4%**	**-0.2%**	**7.7%**	**10.0%**

- Healthcare growing organically in H1 on the basis of a strong Q1 supported by resilient Oncology and General Medicine portfolio in Q2, overall June visibly stronger than May and April
- Accelerating Process Solutions growth is overcompensating flat Applied Solutions and declining Research Solutions where demand was impacted by COVID-19 related lockdowns
- Semiconductor Solutions organic growth accelerated from Q1 to Q2 – however, COVID-19 impact on Display and Surface Solutions results in overall organic decline

H1 YoY EBITDA pre



- EBITDA pre growing slower than sales organically, largely due to non-recurring Healthcare income (~€185 m higher in H1 2019)
- Margin accretive Versum portfolio effect
- FX tailwinds from U.S. and Taiwan dollar did not fully offset currency headwinds from some emerging markets

Totals may not add up due to rounding

H1 2020: Overview

Key figures

[€m]	H1 2019	H1 2020	Δ
Net sales	7,717	**8,489**	10.0%
EBITDA pre	2,068	**2,256**	9.1%
Margin (in % of net sales)	*26.8%*	***26.6%***	-0.2pp
EPS pre	2.67	**2.80**	4.9%
Operating cash flow	1,235	**1,019**	-17.5%

[€m]	Dec. 31, 2019	June 30, 2020	Δ
Net financial debt	12,363	**12,560**	1.6%
Working capital	3,944	**4,474**	13.4%
Employees	57,071	**57,523**	0.8%

Comments

- A strong Q1, Versum portfolio effect and accelerating growth in Process and Semiconductor Solutions drive sales above last year, despite materializing COVID-19 impact in Q2
- EBITDA pre growing despite lower non-recurring income components and fixed cost under-absorption due to lower sales amid COVID-19 impact
- EPS pre growing slower than EBITDA pre driven by a lower financial result
- Lower operating cash flow driven foremost by GSK upfront payment in 2019 and higher working capital in 2020

Totals may not add up due to rounding

Reported figures

Reported results

[€m]	H1 2019	H1 2020	Δ
EBIT	997	**1,207**	21.0%
Financial result	-174	**-201**	15.6%
Profit before tax	824	**1,006**	22.2%
Income tax	-203	**-259**	27.5%
Effective tax rate (%)	24.7%	**25.8%**	1.1pp
Net income	659	**746**	13.1%
EPS (€)	1.52	**1.72**	13.2%

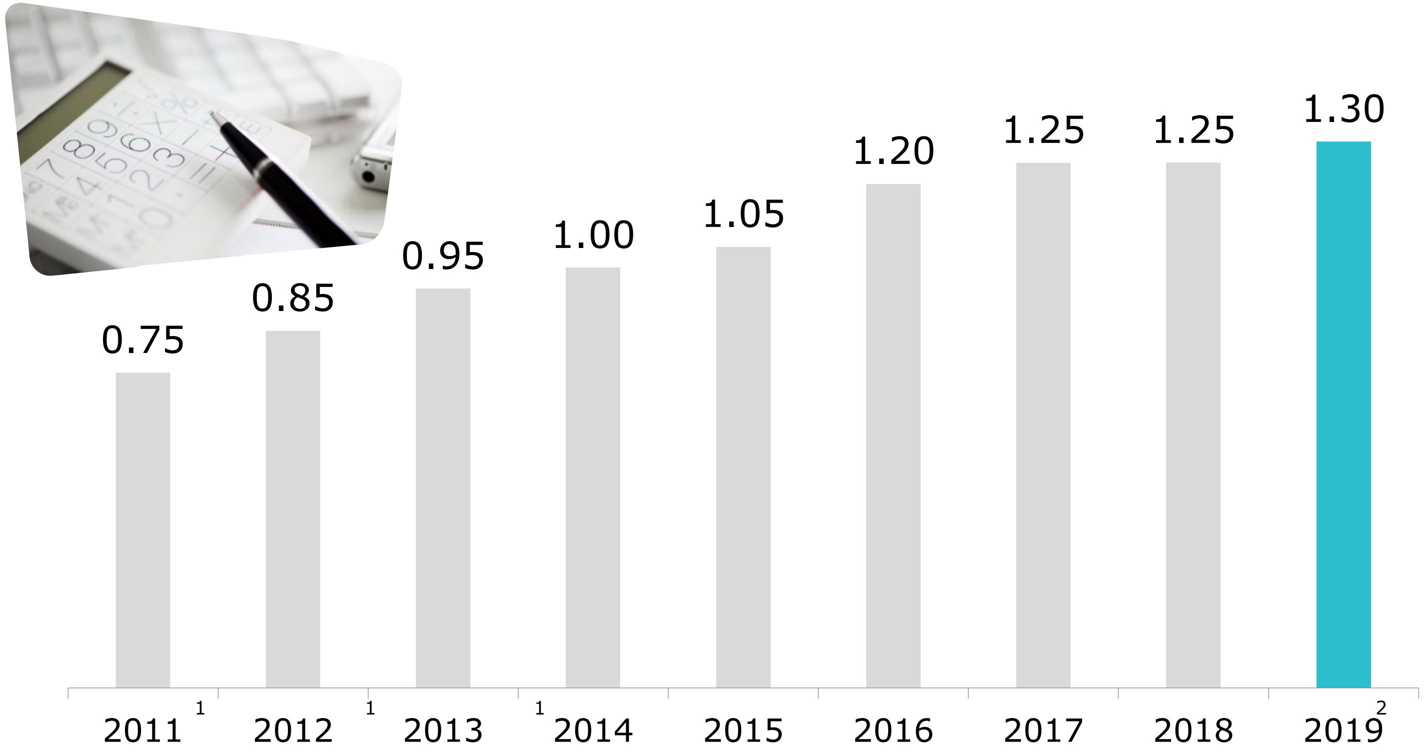
Comments

- EBIT increase driven by Versum portfolio effect and Life Science growth, partially offset by lower non-recurring income, higher depreciation & amortization from Versum PPA and impairments in Performance Materials
- Financial result impacted by LTIP and higher interest expenses related to Versum financing
- Effective tax rate within guidance range of ~24-26%
- Higher net income and EPS reflect higher EBIT

Totals may not add up due to rounding

Sustainable dividend growth

Dividend[1] development 2011-2019



2019 dividend

- Dividend of €1.30 (+4% YoY) per share proposed[2] for 2019
- Payout ratio of 23.4% of EPS pre in 2019; we aim at 20–25% of EPS pre
- Dividend yield[3] of 1.2%

[1]Adjusted for share split, which has been effective since June 30, 2014; [2]Final decision is subject to Annual General Meeting approval;
[3]Calculated with 2019 year-end share price of € 105.35 per share.

Healthcare Pipeline

July 31, 2020

Phase I

berzosertib (M6620)
ATR inhibitor
Solid tumors

peposertib (M3814)
DNA-PK inhibitor
Solid tumors[1]

M1774
ATR inhibitor
Solid tumors

M3258
LMP7 inhibitor
Multiple myeloma

M4344
ATR inhibitor
Solid tumors

M8891
MetAP2 inhibitor
Solid tumors

bintrafusp alfa
TGFbeta trap/anti-PD-L1
Solid tumors

M9241 (NHS-IL12)
Cancer immunotherapy
Solid tumors[1]

M5049
TLR7/8 antagonist
Immunology

M6495
anti-ADAMTS-5 nanobody
Osteoarthritis

M5717
PeEF2 inhibitor
Malaria

Phase II

peposertib (M3814)
DNA-PK inhibitor
Rectal cancer

tepotinib
MET kinase inhibitor
Non-small cell lung cancer

bintrafusp alfa
TGFbeta trap/anti-PD-L1
Non-small cell lung cancer 1L

bintrafusp alfa
TGFbeta trap/anti-PD-L1
Non-small cell lung cancer 1L/2L

bintrafusp alfa
TGFbeta trap/anti-PD-L1
Locally advanced non-small cell lung cancer

bintrafusp alfa
TGFbeta trap/anti-PD-L1
Biliary tract cancer 1L

bintrafusp alfa
TGFbeta trap/anti-PD-L1
Biliary tract cancer 2L

bintrafusp alfa
TGFbeta trap/anti-PD-L1
Cervical cancer 2L

avelumab
anti-PD-L1 mAb
Solid tumors[2]

avelumab
anti-PD-L1 mAb
Non-small cell lung cancer[2]

avelumab
anti-PD-L1 mAb
Urothelial cancer[2]

M5049
TLR7/8 antagonist
Covid-19 pneumonia

atacicept
anti-BlyS/APRIL fusion protein
Systemic lupus erythematosus

atacicept
anti-BlyS/APRIL fusion protein
IgA nephropathy

sprifermin
fibroblast growth factor 18
Osteoarthritis

M1095 (ALX-0761)[3]
anti-IL-17 A/F nanobody
Psoriasis

Phase III

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

evobrutinib
BTK inhibitor
Multiple sclerosis

Registration

tepotinib
MET kinase inhibitor
Non-small cell lung cancer, *MET*ex14 skipping[4]

avelumab
anti-PD-L1 mAb
Urothelial cancer 1L-M[5]

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

1L, first-line treatment; 1L-M, first-line maintenance treatment; 2L, second-line treatment.

[1] Includes studies in combination with avelumab. [2] Avelumab combination studies with talazoparib, axitinib, ALK inhibitors, cetuximab, or chemotherapy. [3] 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. [4] As announced on March 25 2020, tepotinib was approved in Japan for the treatment of patients with non-small cell lung cancer harboring *MET*ex14 skipping. [5] As announced on June 30, 2020, Avelumab was approved in US for maintenance treatment of patients with locally advanced or metastatic urothelial carcinoma (UC) that has not progressed with first-line platinum-containing chemotherapy.

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.

Tepotinib: Significant unmet need

Tepotinib is a highly selective oral, once daily, MET TKI that blocks MET-mediated signaling pathways

- Preclinical and clinical evidence support MET activation as a **primary oncogenic driver** in **lung cancer subsets** and as a **secondary driver** of acquired resistance to targeted therapy in other lung cancer subsets[1]
- Higher **prevalence of MET alterations amongst elderly patients in Lung** (median age of patients with METex14: 72.5 years)
- Evidence exists to support the **role of MET in cancers and resistance settings other than lung cancer**

Adressable Patient Population

Total global NSCLC patients
(2 million new cases/year)[2]

- METex14: ~3%
- METamp: ~2%
  → ~3-5% of total NSCLC population → VISION Trial (NCT02864992)
- EGFRm+: US/EU: ~12% Asia: ~35%
  → 15 – 20% with METamp → 2-5% of total NSCLC population → INSIGHT 2 Trial (NCT03940703)
- Other genetic alterations

Key Achievements

- **SAKIGAKE designation** awarded in Japan, **Breakthrough designation** awarded by US FDA
- **METex14:** Tepmetko approved in Japan in March, USA filing on track under RTOR
- **EGFRm+/METamp:** INSIGHT 2 program started in 2019, study design adapted in 2020 to align with current treatment landscape

[1]Drilon A et al., J Thoracic Oncol. 2016; [2]Bray F, et al. CA Cancer J Clin. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. 2018;68(6):394–424. https://doi.org/10.3322/caac.21492 PMID:30207593

Tepotinib: Program overview
Development focused on biomarker enriched patient populations

	2017	2018	2019	2020	2021	2022	Est. primary completion[1]
NSCLC	NSCLC MET Exon 14 Skipping Alterations (VISION study)		Jun + follow-up[2]				• Clinical activity demonstrated Planned enrollment: 120 (est.) – liquid and tissue; **enrollment completed** • **Enrollment in cohort C ongoing** • Pr. endpoint: Confirmed ORR (Independent)
	LBx MET Amp. (VISION – Cohort B)						
	NSCLC 2L EGFRm (with Gefitinib, INSIGHT 1 study)	Dec 2017 (18-month data presented at WCLC 19)					**NSCLC 2L EGFRm (with Gefitinib):** • Enrollment: 70 (act.) • Comparator: Pemetrexed + Cisplatin/ Carboplatin • Pr. endpoint: PFS (Investigator) • 18 month follow-up to be presented in Q3 2019
		NSCLC 2L EGFRm (with Osimertinib[3], INSIGHT 2 study)				Nov	**NSCLC EGFRm (with Osimertinib[3]):** • Enrollment: 120 (est.), two-arm • Pr. endpoint: Objective response rate by independent review, Dose limiting toxicity (safety run-in only)
HCC	HCC 1L		Oct				• **Primary endpoint met** • Enrollment: 90 (act.) • Pr. endpoint: TTP (Independent)
	HCC 2L		Feb				• **Primary endpoint met** • Enrollment: 49 (act.; failed sorafenib) • Pr. endpoint: PFS status 12 weeks (Investigator)

Primary data from fully enrolled cohort A presented at ASCO 2020

Updated design

[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; [3]brand name: Tagrisso®

Tepotinib: Updated data presented at ASCO 2020
9-months follow-up from the VISION study highlights durable clinical activity of Tepotinib[1]

Patients

- As of 01 January 2020, **152 patients received tepotinib (safety population)** and **99 patients comprised the primary efficacy population** with ≥9 months' follow-up data
- 60/152 and 22/99 patients were still receiving tepotinib at data cut-off

Clinical response in the primary efficacy population

- **Objective response rate by independent review (primary endpoint)** was 46.5–50.0% and **by investigator assessment was 55.6–61.7%**

	Liquid-biopsy group[†] (n=66)		Tissue-biopsy group[‡] (n=60)		Combined[*] (n=99)	
	IRC	INV	IRC	INV	IRC	INV
Objective response rate, % (95% CI)	48.5 (36.0, 61.1)	56.1 (43.3, 68.3)	50.0 (36.8, 63.2)	61.7 (48.2, 73.9)	46.5 (36.4, 56.8)	55.6 (45.2, 65.5)
Duration of response, median months (95% CI)	9.9 (7.2, ne)	14.0 (7.3, ne)	15.7 (9.7, ne)	16.4 (9.7, ne)	11.1 (7.2, ne)	14.0 (9.7, 18.3)
Disease control rate, % (95% CI)	65.2 (52.4, 76.5)	69.7 (57.1, 80.4)	68.3 (55.0, 79.7)	78.3 (65.8, 87.9)	65.7 (55.4, 74.9)	72.7 (62.9, 81.2)

[†]Two patients were liquid-biopsy positive only. [‡]25 patients were tissue-biopsy positive only; objective response rate by independent review was 40.0% (95% CI: 21.1, 61.3) and 48.0 (95% CI: 27.8, 68.7) by investigator assessment. [*]Combined = liquid-biopsy positive and/or tissue-biopsy positive.
INV, investigator assessment; IRC, independent review committee; ne, not estimable; CI, confidence interval.

Manageable tolerability profile (n=152)

- Grade ≥3 treatment-related adverse events reported in 27.6% of patients
- **Few adverse events** leading to discontinuation (permanent discontinuations in 11.2% of patients)
- **No grade 5** TRAEs, few grade 4 (2%)

Activity in patients with brain metastases

- **Outcomes in patients with baseline brain metastases** (n=11), all of which were nontarget lesions, were **comparable to the overall population**

May 29, 2020: Updated data published in **The New England Journal of Medicine (NEJM)[2]**


ORIGINAL ARTICLE

Tepotinib in Non–Small-Cell Lung Cancer with MET Exon 14 Skipping Mutations

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[1]Le et al., Primary efficacy and biomarker analyses from the VISION study of tepotinib in patients with NSCLC with MET exon 14 skipping, presented at ASCO 2020 (Abstract #9556), [2] Paik et al., Tepotinib in Non–Small-Cell Lung Cancer with MET Exon 14 Skipping Mutations, New England Journal of Medicine, 29/05/2020, DOI: 10.1056/NEJMoa2004407

Tepotinib: Clinical Efficacy in Met-amp EGFR-mutant Population
INSIGHT 2 study follows from encouraging INSIGHT 1 data

Data from INSIGHT 1 study (18-months follow-up presented at WCLC 2019)[1]

- **MET-amp population:**

Endpoint	Tepotinib + gefitinib	Chemotherapy
Primary - PFS (HR 0.13 [90% CI 0.04, 0.43])	16.6 m	4.2 m
Secondary - ORR (OR 2.67 [90% CI 0.37, 19.56])	66.7%	42.9%
Secondary - OS (HR 0.09 [CI 0.01, 0.54])	37.3 m	13.1 m

- **METamplification** can be considered a **suitable biomarker for treatment with tepotinib**
- **Safety:** generally well-tolerated, most AEs mild to moderate
- Enrollment halted due to low recruitment

INSIGHT 2 study

Recently updated to reflect evolved standard of care

Study Design:
- Two-arm study, open label, N = 120
- Enrollment restricted to participants whose disease has progressed following first-line treatment with osimertinib[2]
- MET Amplification Determined Centrally by Fluorescence in situ Hybridization (FISH); explorative LBx testing

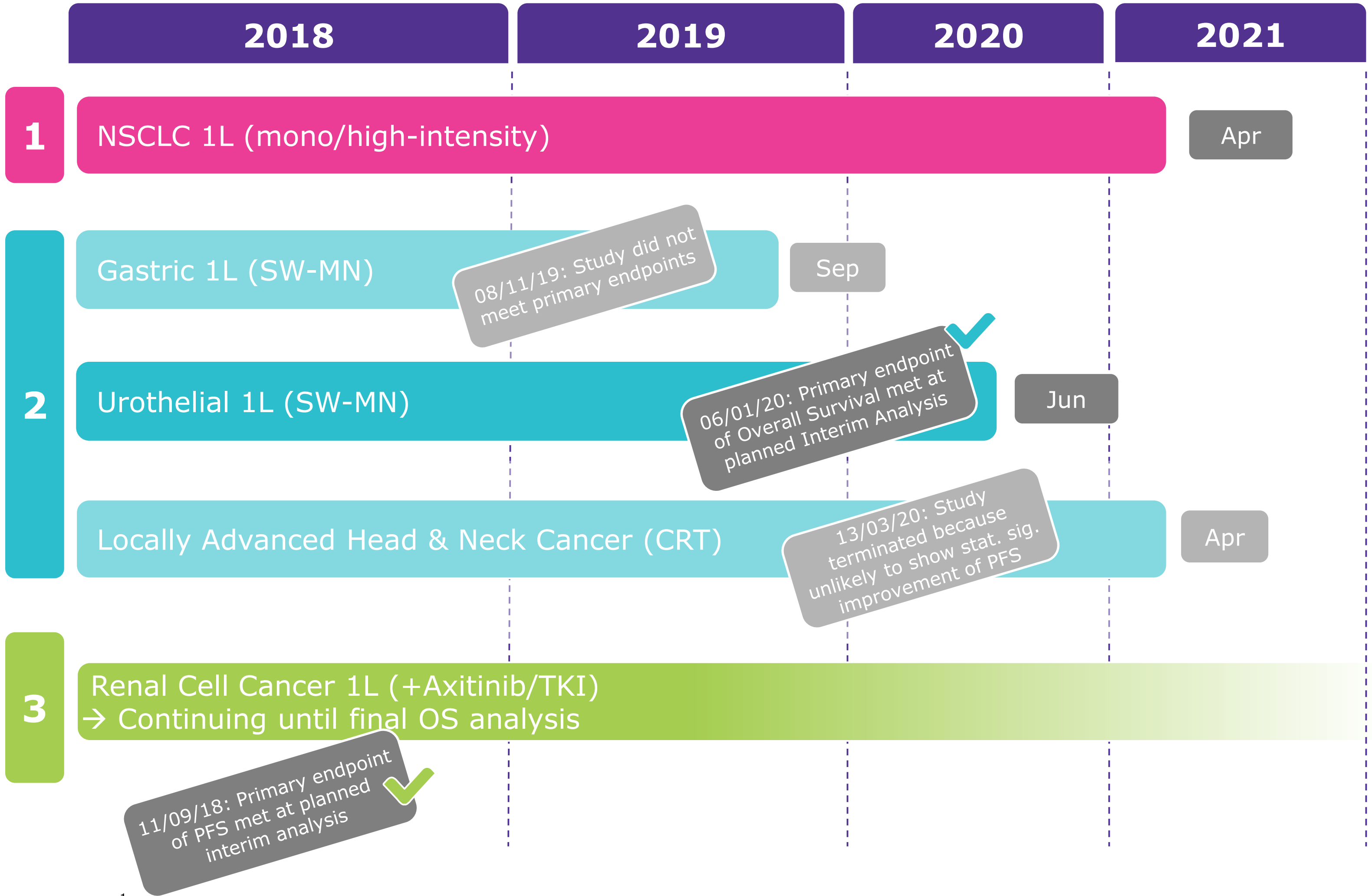
Arms & Interventions:
1. Tepotinib 500mg QD + Osimertinib 80mg QD
2. Tepotinib 500mg QD

Primary endpoints:
- Objective response rate by independent review
- Number of participants experiencing dose limiting toxicities

[1]Yi Long Wu et al., Long term outcomes to tepotinib plus gefitinib in patients with EGFR mutant NSCLC and MET dysregulation: 18 month follow up, presented at WCLC 2019; [2]brand name: Tagrisso®

Avelumab: Program overview

Ongoing studies – JAVELIN Bladder 100 data (UC 1L) presented at ASCO 2020 plenary session



Est. primary completion[1]

Leverage potential of unique molecular characteristics (ADCC)

Investigate potential of immunogenic priming (incl. combination and sequencing with CT/CRT)

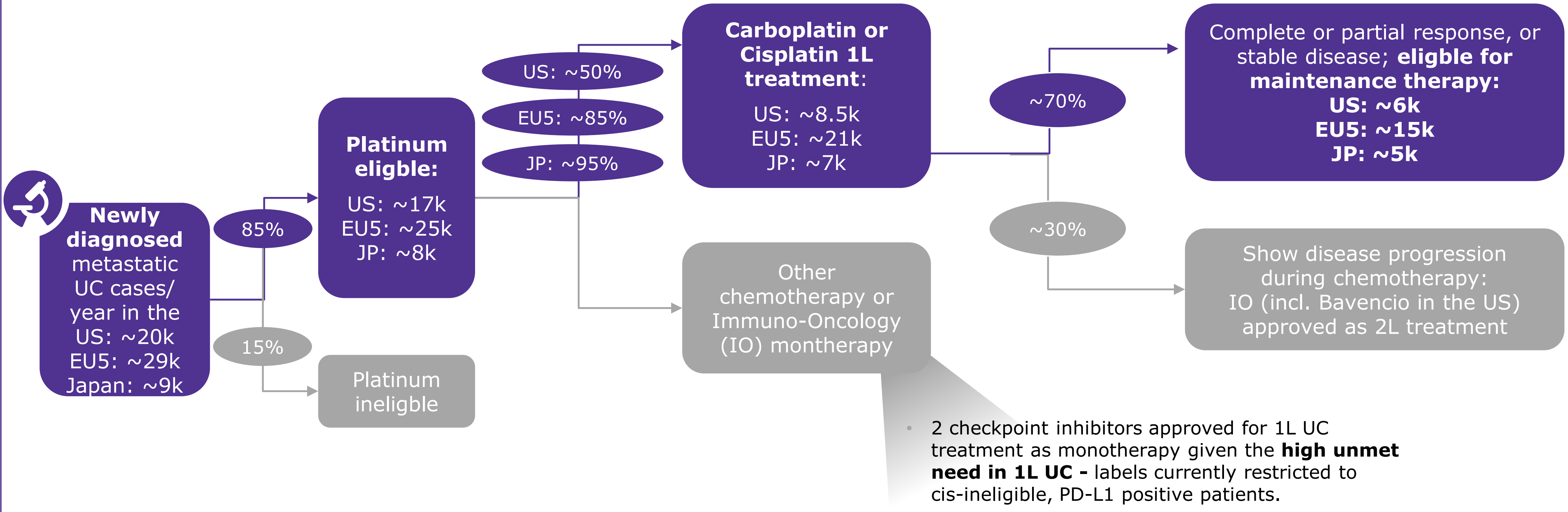
Proprietary combinations

[1]Estimated primary completion date according to clinicaltrials.gov as of August 4, 2020, timelines are event-driven and may be subject to change; Acronyms: NSCLC = Non-small Cell Lung Cancer, CT = Chemotherapy, CRT = Chemoradiotherapy, DMC = Data Monitoring Committee (DMC), MN = Maintenance, PFS = Progression-Free Survival, SW = Switch, TKi = Tyrosine Kinase inhibitor

Avelumab: UC 1L / JAVELIN Bladder 100

There is an urgent need for a 1L treatment strategy that maintains and reinforces the initial benefit of induction chemotherapy

Durable responses to standard of care (1L chemotherapy) are rare with most patients experiencing progression within 9 months of treatment[1]



1: Kantar Health Patient Metrics & Kantar Health Treatment Architecture for epidemiological data; IMS Claims, Kantar and IPSOS for triangulation of market shares

Avelumab: UC 1L / JAVELIN Bladder 100

First & only immunotherapy to significantly improve OS as a 1L treatment for locally advanced or metastatic urothelial cancer in a Phase III study

JAVELIN Bladder 100 Study Design – Switch-Maintenance[1]

Endpoints measured from randomization (post-chemo)

Treatment until confirmed disease progression, unacceptable toxicity, or other protocol-defined criteria for withdrawal

Locally advanced or metastatic UC not progressed (CR, PR, or SD) with 1L chemo[2]

N=700

R 1:1

Avelumab 10 mg/kg 1h IV Q2W + BSC[3]

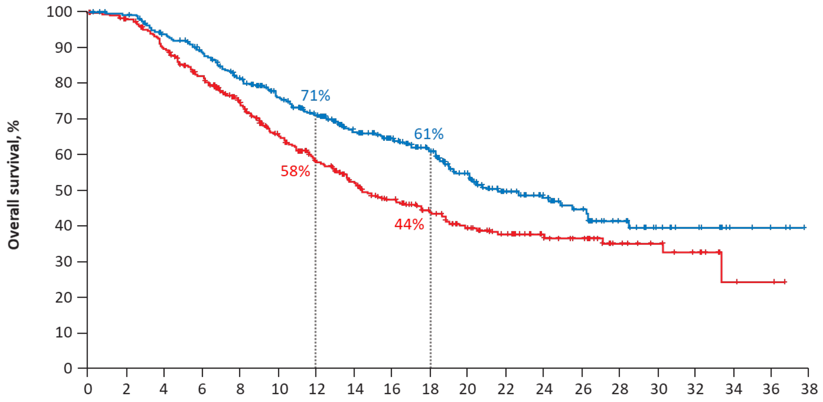
Best Supportive Care (BSC) alone[3]

Primary endpoint: OS

Secondary endpoints:
PFS and objective response per RECIST 1.1, safety & tolerability, PROs

Transformative OS data of "historic significance" featured at the ASCO 2020 plenary session[4]

- **31% reduction in risk of death** and **an increase of 7 months in the median overall survival** (21.4 months for Bavencio® + best supportive care (BSC) versus 14.3 months for BSC alone



Median duration of treatment[5]:
Avelumab + BSC arm: 24.9 weeks (~5.8 mths)
BSC alone arm: 13.1 weeks

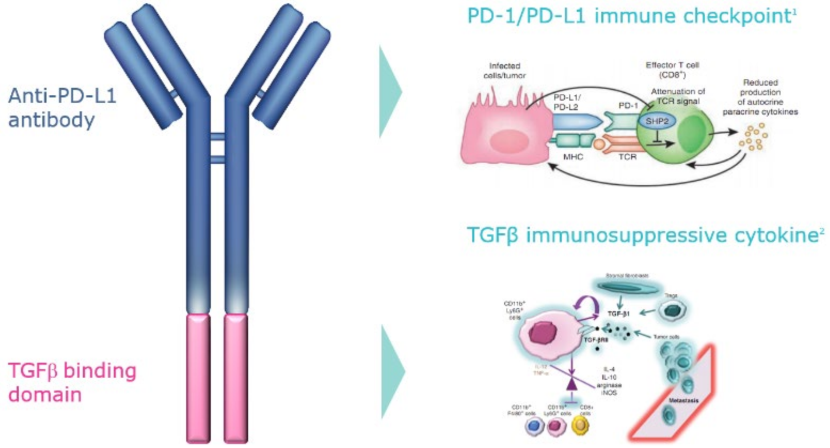
- **OS improvements consistent across pre-specified subgroups**, regardless of the type of platinum-based chemotherapy received and patients' PD-L1 status
- **No new safety signals** were identified, and the safety profile was consistent with previous studies of Bavencio® monotherapy

1: NCT02603432; 2: 4-6 cycles of standard 1L chemotherapy: gemcitabine + cisplatin or gemcitabine + carboplatin; 3: BSC administered as deemed appropriate by the treating physician, and could include treatment with antibiotics, nutritional support, correction of metabolic disorders, optimal symptom control and pain management etc.; 4: Powles T, et al. Avelumab as First-Line Maintenance Therapy for Locally Advanced or Metastatic Urothelial Carcinoma. Presented at ASCO 2020; 5: Mean duration of treatment (DoT) accounts for the substantial number of patients who remain progression free beyond 12 months, this is higher than the median DoT; Acronyms: BSC = best supportive care, CR = complete response, PR = partial response, PRO = patient reported outcome, Q2W = every two weeks, SD = stable disease

Bintrafusp alfa[1] (M7824)
An innovative first-in-class bifunctional fusion protein discovered in-house leading the TGF-β 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-β signaling)
- Demonstrated **superior anti-tumor activity in pre-clinical study** compared to anti-PD-L1 alone, and anti-PD-L1 and TGF-β given in combination as separate agents
- **Great excitement in IO community** about M7824 uniquely addressing TGF-ß 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

- **Multiple high priority immuno-oncology clinical development studies** ongoing or expected to commence shortly, including **studies in non-small cell lung and biliary tract cancers with registrational intent** and most recently **advanced, unresectable cervical cancer**
- Further plans to be communicated at a later stage

[1]proposed International Nonproprietary Name (INN)
Acronyms: NSCLC = Non-small Cell Lung Cancer, IO = Immuno-Oncology

Bintrafusp alfa[1] (M7824): Strategic Alliance with GlaxoSmithKline (GSK)
Attractive payment terms rewarding developmental success

Effective as of March 27, 2019

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-U.S.

[1] proposed International Nonproprietary Name (INN)

Bintrafusp alfa: Development Strategy

Program overview: Five pivotal studies on track, several safety and signal finding studies recently initiated or in planning

Timeline: 2019 | 2020 | 2021 | 2022 | 2023 | 2024

Type	Study	Est. primary completion[1]
Pivotal	**Lung 037:** NSCLC 1L mono vs Pembrolizumab (in PD-L1 high)	Q2
Pivotal	**Lung 005:** Unresectable Stage III NSCLC (+ cCRT) vs Durvalumab	Q1
Signal finding	**Lung 024:** NSCLC 1L (+ chemotherapy)	Q4
Pivotal	**BTC 047:** BTC 2L mono	Q4
Pivotal	**BTC 055:** BTC 1L (+chemotherapy)	Q4
Pivotal NEW	**Cervical 017:** Cervical Cancer 2L (monotherapy)	Q2
Signal finding	**Urothelial Cancer 2L** (monotherapy)	Q2
NEW	**Solid tumors** (M6223/anti-TIGIT mono and Bintrafusp alfa combo)	Q3
NEW	**TNBC 020:** TNBC 2L mono	Q1

Leverage strong signal observed in 2L NSCLC PD-L1 high patients cohort

Investigate potential of immunogenic priming in NSCLC (incl. combination with CT/CRT)

Confirm signal from 2L BTC cohort where no SOC is approved

Confirm efficacy in HPV+ cancer with significant unmet need

Phase Ib Trial to Evaluate Efficacy and Safety

[1] Estimated primary completion date according to clinicaltrials.gov as of August 4, 2020, 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: Developmental Progress
2L Biliary Tract Cancer (BTC) monotherapy trial recently initiated

M7824 BTC data presented at ESMO 2018

- **Need:** Few available treatment options (no 2L standard of care)[1]
- **Results: Encouraging activity[2]** in 30 Asian patients with pretreated biliary tract cancer
- **ORR[2]:** 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[1])
- Responses observed **irrespective of PD-L1 expression levels[2]**
- **Orphan Drug Designation** granted by FDA in December 2018

Leading PDx data presented at ASCO 2019[3]

- **ORR:** 5.8% (PhII, 2L); 13.0% (PhI)
- **OS:** 7.4 months (PhII, 2L); 6.2 months (PhI)

INTR@PID BTC 047

INTR@PID CLINICAL TRIALS
BTC 047

Locally advanced or metastatic BTC 2L
N = 141
→ M7824 1200 mg IV, Q2W, up to 24 months

Endpoints

Primary endpoint: ORR

Secondary endpoints: DOR, DRR ,PFS, OS, Safety

Biomarker endpoints: PDL1 expression MSI status, comprehensive genomic profiles

[1]Lamarca A, et al. Ann Oncol. 2014;25(12):2328–2338; [2]Yoo et al., Poster presented at the 43rd European Society for Medical Oncology Annual Meeting, Munich, October 19–23, 2018; [3]Bang et al., "Pembrolizumab (pembro) for advanced biliary adenocarcinoma: Results from the KEYNOTE-028 (KN028) and KEYNOTE-158 (KN158) basket studies", presented at ASCO 2019; Acronyms: DoR = Duration of Response, NSCLC = Non-small Cell Lung Cancer, NR = Not Relevant, MSI = Microsatellite Instability Status , OS = Overall Survival, PFS = Progression-Free Survival

Bintrafusp alfa: Developmental Progress
NSCLC Stage III cCRT Combo trial recently initiated

NSCLC 2L data presented at ESMO 2018

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

Pre-clinical data on M7824 + RT combo[5]

- M7824 and RT combination therapy **enhances antitumor activity relative to mono-therapies** in mouse models
- EMT, VEGF, and RT-induced fibrosis gene signatures are decreased with M7824 and combination therapy, and **M7824 reduces RT-induced fibrosis**
- Results **support evaluation of M7824 + RT in the clinic**

INTR@PID LUNG 005

INTR@PID CLINICAL TRIALS
LUNG 005

Stage III unresectable NSCLC n=350

→ Experimental Arm: M7824 Q2W 1200mg + cCRT[4] → M7824 (up to 1 year after cCRT until acceptable toxicity)

→ Active Comparator Arm: Placebo Q2W + cCRT[4] → Durvalumab (up to 1 year after cCRT until acceptable toxicity)

Endpoints

Primary endpoint: PFS

Main secondary endpoints: OS, Safety, Pulmonary function, Association of PD-L1 expression at base line and efficacy

[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); [4]Cisplatin/Etoposide or Carboplatin/Paclitaxel or Cisplatin/Pemetrexed concomitant with Intensity Modulated Radiation Therapy (IMRT); [5]Lan et al., Combination of M7824 and radiation therapy enhances antitumor activity, increases immune response, and modulates radiation-induced fibrosis in cancer models, 2018

Bintrafusp alfa: Developmental Progress
Data shown at AACR 2019 highlights opportunity in HPV-related cancers

Efficacy variable	HPV-associated cancer (n=43)	HPV+* (n=36)
Confirmed BOR, n (%)		
CR	2 (4.7%)	2 (5.6%)
PR	10 (23.3%)	9 (25%)
SD	6 (14.0%)	5 (13.9%)
PD	20 (46.5%)	17 (47.2%)
Not evaluable	5 (11.6%)	3 (8.3%)
Delayed PR†	3 (7.0%)	3 (8.3%)
ORR per RECIST v1.1, n (%) [95% CI]	12 **(27.9%)** [15.3–43.7]	11 **(30.6%)** [16.3–48.1]
Total clinical response rate†, n (%)	15 **(34.9%)**	14 **(38.9%)**
DCR, n (%)	18 (41.9%)	44.4%

Prevalence: >630,000 new cases of HPV-related cancer are reported worldwide annually[1]

Response Rates:

- Bintrasfusp alfa response rates **compared favorably to those with anti–PD-1 inhibitors** (ORRs of 13%–24%)[1-7]
- **ORR was 27.9% and 30.6% in HPV-associated and HPV+ cancers, respectively**
- Including three additional patients with delayed PRs after initial PD: **Total response rate was 34.9% and 38.9% in HPV-associated and HPV+ cancers, respectively**

Long-term Benefit:

- **Most responses durable** with 4 responses having DoR >18 months and 11/15 responses ongoing at the data cutoff
- Responses to bintrafusp alfa occurred **irrespective of tumor type** or PD-L1 expression
- **Safety profile was similar to anti–PD-(L)1 therapy[1,5]** except for SCC/KAs and low grade mucosal bleeding which are anticipated AEs with TGF-β inhibition[8,9]

Cervical Cancer 2L study recently posted on ct.gov NEW

†Due to confirmed PD before onset of response, these patients did not meet response criteria by RECIST v1.1; *HPV status was determined from prior documentation, or by using cobas® 4800 HPV Test (Roche) in the dose escalation phase or RNA sequencing (RNASeq) in the expansion phase. [1]Bauml J, et al. J Clin Oncol. 2017;35:1542–49; [2]Ott PA, et al. Ann Oncol. 2017;28:1036–41; [3]Hollebecque A, et al. J Clin Oncol. 2017;35(Suppl):Abstract 5504; [4]Chung HC, et al. J Clin Oncol. 2018;36(Suppl):Abstract 5522; [5]Ferris RL, et al. N Engl J Med. 2016;375:1856–67; [6]Mehra R, et al. Br J Cancer. 2018;119:153–59; [7]Morris VK, et al. Lancet Oncol. 2017;18:446–53; [8]Lacouture ME, et al. Cancer Immunol Immunother. 2015;64:437–46; [9]Trachtman H, et al. Kidney Int. 2011;79:1236–43

DNA Damage Response (DDR)
Leadership in next generation assets beyond PARP

DNA Damage Response

A Core Research Innovation Cluster

- DDR defects are an **"achilles heel" of cancer cells**
- **ATR, ATM and DNA-PK are the trinity of targets** that orchestrate cellular response DNA damage and replication stress
- **Leading clinical portfolio** with 6 assets (in Phases 1 and 2) targeting ATR, ATM and DNA-PK
- Rich pre-clinical and translational science driving **biological innovation and patient selection**
- Ideally placed to drive **novel combinations within DDR portfolio and broader immuno-oncology portfolio**
- Multiple **early signal finding studies** allow for **evidence-based decision making** & **focus** in future development

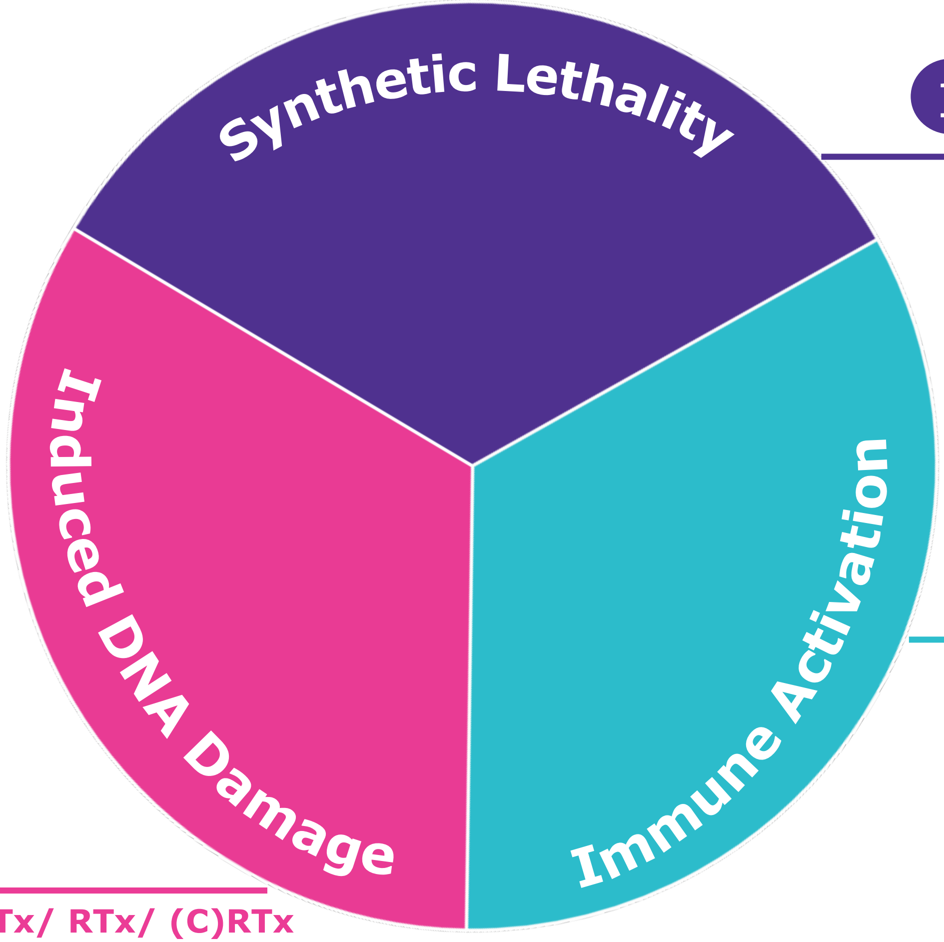
Acronyms: ATM = Ataxia-Telangiectasia Mutated, ATR = Ataxia Telangiectasia and Rad3, DNA-PK = DNA-dependent Protein Kinase, PARP = Poly ADP Ribose Polymerase

DNA Damage Response (DDR)
Development is focused on three foundations

Differentiating aspects of cancer DDR that can be targeted therapeutically[1]:

- **Loss of one or more DDR pathways**
- **Increased levels of replication stress**
- **Increased levels of endogenous DNA damage**

Increased Immunogenicity



1
Monotherapy
DDRi + DDRi (incl. PARP)
Grow the DDR class, building on PARPs

2
DDRi + IO
Differentiate future IO treatments

3
DDRi + CTx/ RTx/ (C)RTx
Improve efficacy in post-IO landscape

[1]Adapted from M. O'Connor, Targeting the DNA Damage Response in Cancer, *Molecular Cell Review*, November 2015;
Acronyms: IO = Immuno-Oncology, CT = Chemotherapy, DDRi = DNA Damage Response inhibitor, RT = Radiotherapy, (C)RT = Chemo-radiotherapy

DNA Damage Response (DDR)

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

... 2017 | 2018 | 2019 | 2020 | 2021 | ...

Pathway	Compound	Estimated primary completion[1]	Status
ATR-i	M6620 (Berzosertib)		M6620 CT combinations in various settings; data from Ovarian cancer study recently published in the *Lancet Oncology*
ATR-i	M4344	Nov	Phase I dose escalation ongoing for mono- and combination therapy (with CT)
ATR-i	M1774 (New)	Sep	Phase I dose escalation in metastatic or locally advanced unresectable solid tumors
DNA-PK-i	M3814 (Peposertib)	Dec	One study completed (mono), one study ongoing (Phase I + Ib expansion, combination with RT/ CRT)
DNA-PK-i	M3814 (Peposertib) +Avelumab	Jul	Phase I dose escalation initiated (+Avelumab with/without palliative RT), advanced solid tumors
DNA-PK-i	M3814 (Peposertib)	Aug	Phase I/II study initiated for locally advanced rectal cancer (with CRT)
ATM-i	M3541	Sep	Development stopped, focus shifted to M4076 (clinical candidate ATM-i, chemical structure first disclosed at AACR 2019)

[1] Estimated primary completion date according to clinicaltrials.gov as of August 4, 2020, and internal estimates for upcoming studies; timelines are event-driven and may be subject to change

China's VBP: Recently announced round 3 includes metformin, as anticipated, with implementation expected to follow in Q4 2020

Round 1 | Round 2 | Round 3

2019 | 2020 | 2021

March: 4+7 pilot initiated in 4 municipalities[1] and 7 key cities in other provinces[2]

June/July: Provincial expansion to Fujian & Hebei provinces

September: remaining 25 provinces added to "4+7"

December: Official announcement of Round 2 (incl. Concor®)

As of April: Gradual implementation of Round 2, 2 winners granted exclusive access to 60% of total hospital market[3], non-winners (incl. Concor) retain access to remaining 40% of hospital market at a gradient price cut[4] + can freely compete in non-hospital/ retail market

July: Official announcement of Round 3 (incl. Metformin IR and XR), tender parameters: up to 8 winners granted up to 80% of hospital market[3], all manufacturers requested to comply with NMPA guidance on NDMA testing

August: Bidding scheduled for August 20, gradual implementation anticipated as of Q4 2020, in line with company expectations

- ✓ **Growing market:** Chinese metformin market to grow >10% p.a. over the next 5 years
- ✓ **„up to" 80% access and up to 8 winners only a guidance**, to be finalized post-bidding
- ✓ Non-hospital/retail market **not subjected to gradient price cut**
- ✓ Company following a **carefully crafted bidding strategy**

Sustained confidence in **at least stable base business** until 2022

1: Beijing, Shanghai, Chongqing, Tianjin; 2: together encompasses ~1/3 of Chinese drug market; 3: hospital market for bisoprolol and metformin makes up ~70% of total market, this includes urban hospitals, rural hospitals, and community health centers; 4: Concor® price cut in the high single digit %;Acronyms: NMPA = National Medical Products Administration, VBP = Volume-Based Procurement, NDMA = N-nitrosodimethylamine, also known as nitrosamine

Broad portfolio positions Merck KGaA, Darmstadt, Germany, as a growing Multiple Sclerosis player

core portfolio	launch	development
Rebif®	MAVENCLAD® (cladribine) tablets 10 mg	Evobrutinib (BTK-inhibitor)

Core portfolio – Rebif®

- **Stable market share:** within declining interferon class
- **Renewed HCP interest:** driven by updated pregnancy & lactation label
- **Continued blockbuster status in 2020**

Launch – MAVENCLAD®

- **Growth:** Continued growth within the high efficacy and oral class dyamic share
- **Focused execution:** Driving depth and 2nd year returns
- **Global peak sales: €1 - 1.4 bn**

Development – Evobrutinib

- **Advancing on benefit-risk in high efficacy oral category**
- **Blockbuster potential**

Acronyms: HCP = Healthcare Professional

Mavenclad

Mavenclad could change the MS treatment paradigm

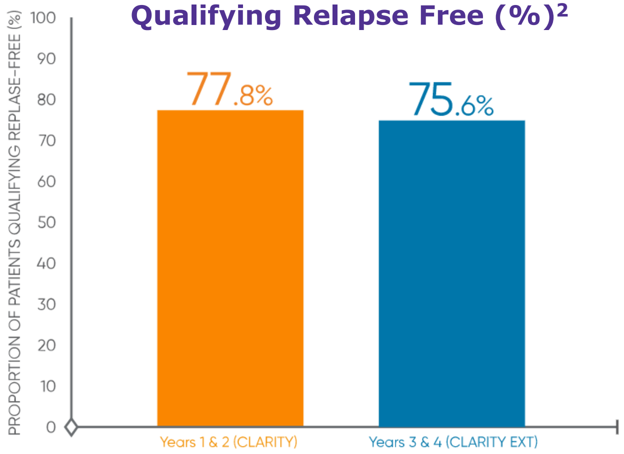
MAVENCLAD® (cladribine) tablets 10 mg

Consistent efficacy: High efficacy[1] across all relevant clinical and radiological endpoints

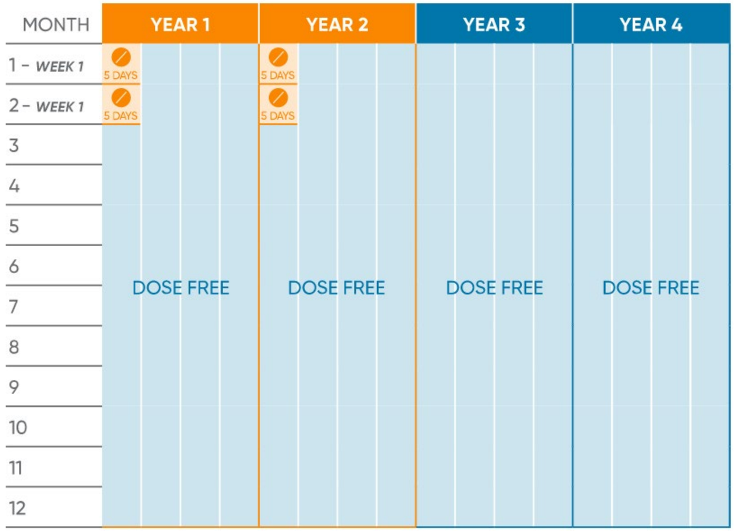
Durability : Relapse-free for 4 years with no treatment in years 3 and 4[2]

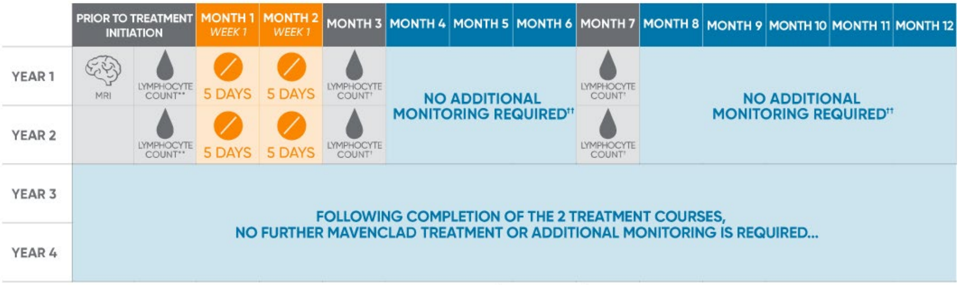
- 58% reduction in annualized relapse rate[2]
- 47% reduction in 6-month confirmed disability progression[3]
- 86% reduction in T1 Gd+ lesions[2]
- 73% reduction in T2 lesions[2]

Proportion of Patients Qualifying Relapse Free (%)[2]



No evidence of disease activity →





Unique posology: Weight-based, max. 20 days of oral treatment[2,3]

Lowest monitoring requirements across all currently approved high-efficacy DMDs in a 4-year horizon

[1]Vs. placebo. The term 'high efficacy' is generally accepted in MS literature; [2]Giovannoni G et al. N Engl J Med 2010; 362:416–426. [3]Cook S et al. AAN 2016; [P3.058].
[3]MAVENCLAD SmPC, 2018

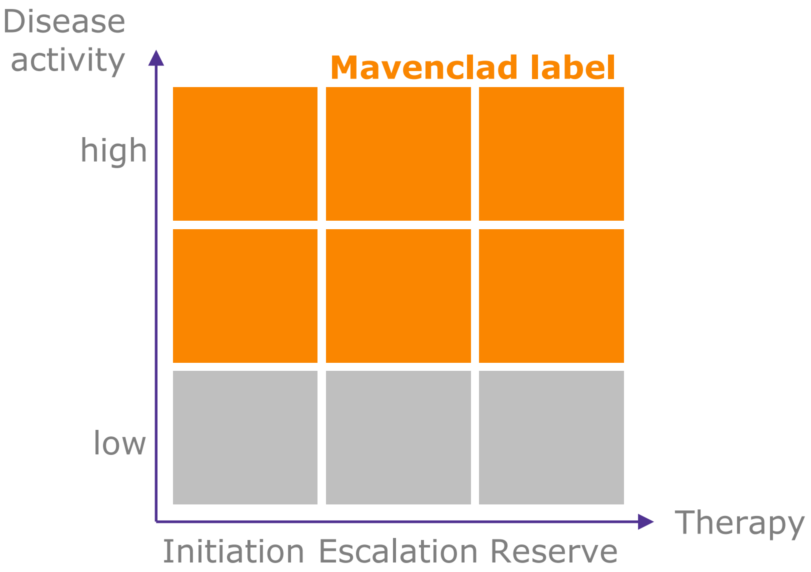
Merck KGaA
Darmstadt, Germany

MAVENCLAD® (cladribine) tablets 10 mg

Mavenclad's attractive label in Europe supports integrated franchise strategy

Mavenclad label covers 60-70% of patients with RRMS[1] within the MS[1] patient population in Europe

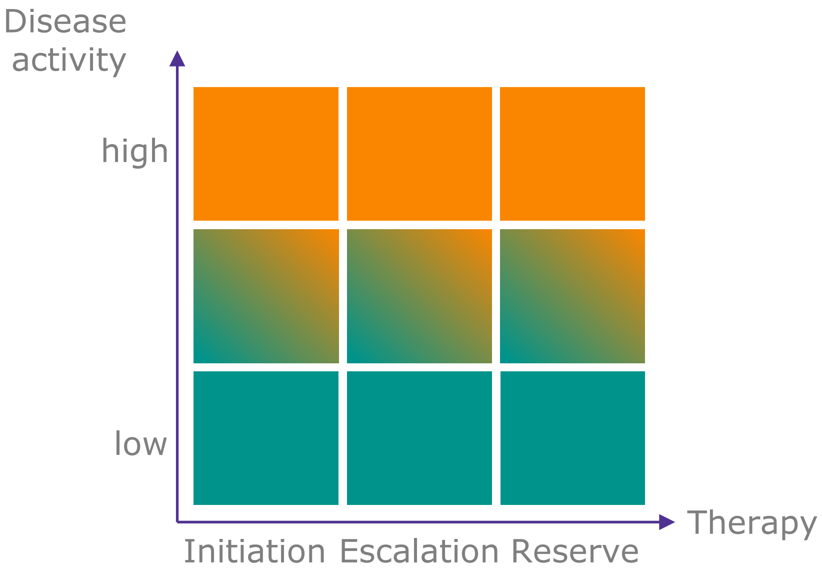
MS patient population[2]



Not covered by label

Groups's overall NDD franchise will cover a broad MS patient pool

RRMS patients, EU-5[3]



Prioritized for MAVENCLAD® (cladribine) tablets 10 mg

Prioritized for Rebif®

Integrated franchise strategy

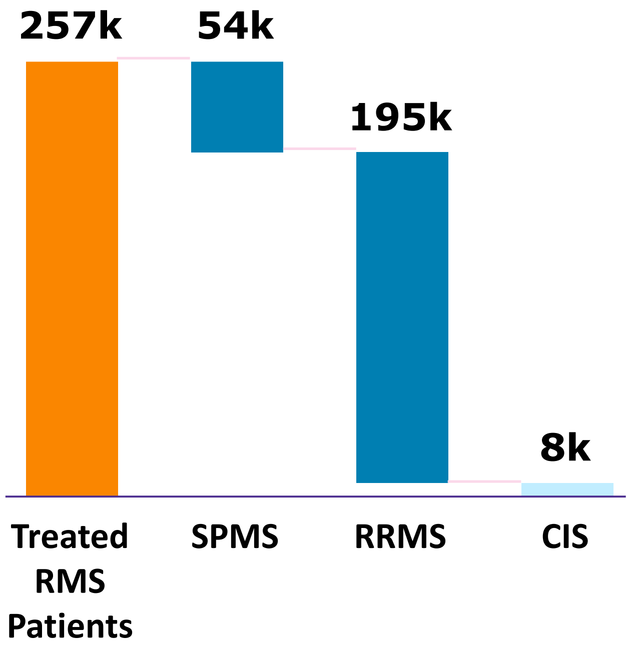
- At patient level: Rebif and Mavenclad are **highly complementary**
- At physician level: High overlap
- Franchise infrastructure investment benefits both brands

[1]Approved by EMA for treatment of highly active relapsing multiple sclerosis; Abbreviations: RRMS = Relapsing-Remitting Multiple Sclerosis; [2]Source: Merck KGaA, Darmstadt, Germany [3]Source: Merck KGaA, Darmstadt, Germany, Ipsos; As of May 2019, Mavenclad was approved in 55 countries globally and reimbursed in half

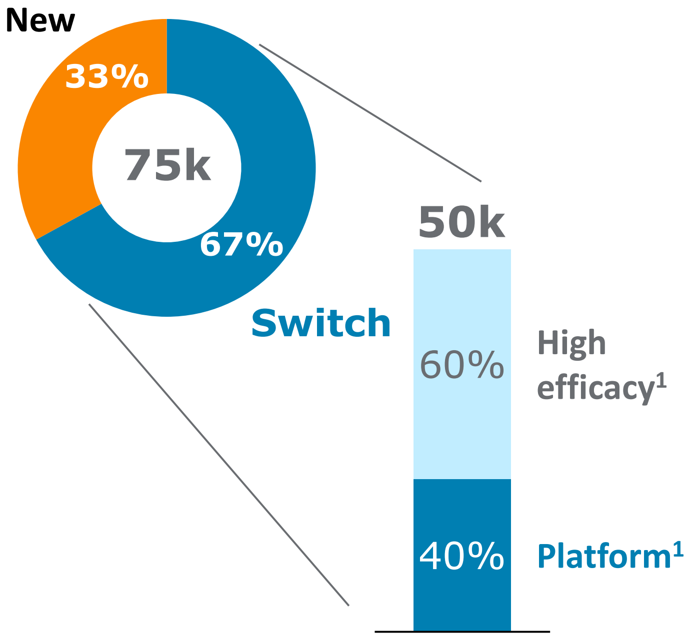
MAVENCLAD® (cladribine) tablets 10 mg

On March 29, the FDA approved Mavenclad for the treatment of adults with relapsing-remitting (RRMS) and active secondary progressive disease (SPMS)

Treated RMS patients in US



Dynamic RMS treated patients



Mavenclad addresses clear medical needs

- **Previously treated** patients represent the vast majority of the dynamic patient pool
- **Lack of efficacy** is the predominant driver of switching, hence observed "high-efficacy" share of switches
- **Intolerance** also drives switching, though to a lesser degree, and results in switches between classes

→ Novel mechanism and unique oral short-course regimen of **Mavenclad addresses these needs**

Source: Decision Resource Group, MS Epidemiology Overview, October 2017; [1]High efficacy includes Ocrevus, Tysabri, Lemtrada, Gilenya – platform includes all other approved agents

Mavenclad

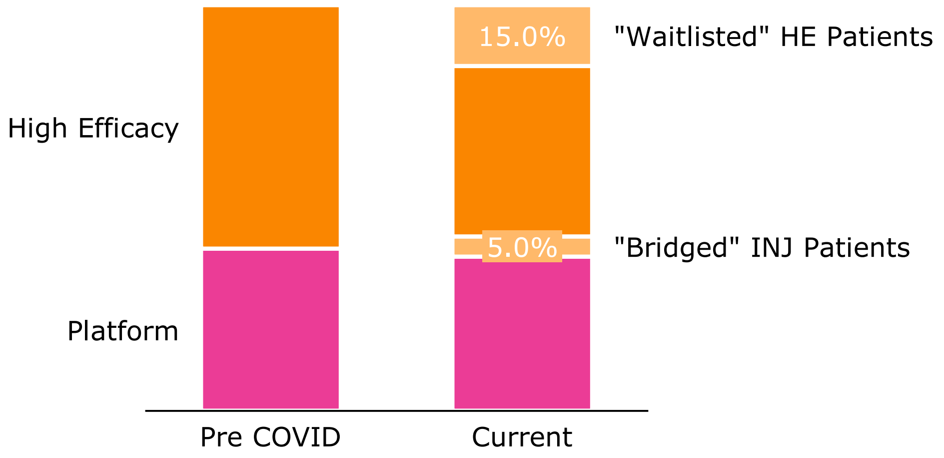
Aiming to capitalize on “waitlisted” patient opportunity amid COVID-19 pandemic

MAVENCLAD® (cladribine) tablets 10 mg

HE MS market: Significant opportunity for rebound in H2

- Diverse guidelines published – KOL debate ongoing
- **Infection risk number 1 choice driver**
- 15% of HE patient starts put on hold and a further 5% “bridged” to platform therapies[1]

US dynamic market[2]:



Mavenclad® : Profile suited to evolved choice drivers

- **Lack of continuous immunosuppression[3]**
- **Transient preferential targeting** of B and T lymphocytes[4]
- Specifically important for viral defense …
  - **Moderate T cell reduction** with lower impact on CD8+[4]
  - **Minimal impact on innate immunity[5-7]**
- Mavenclad® is **easy to use**, with **short-course at-home oral dosing** and a **low monitoring burden[3]**
- **High efficacy that is sustained** beyond total lymphocyte recovery[3]

1: “Monitoring the Impact of COVID-19 on the Pharmaceutical Market”, IQVIA; 2: IQVIA weekly data; 3: Mavenclad® EU SmPC, 2020; 4: Comi G, et al. Mult Scler Relat Disord. 2019;29:168–174; 5: Rieckmann P, et al. ECTRIMS 2009 [P816]; 6: Sorensen PS et al. ECTRIMS-ACTRIMS 2017 [P1141]; 7: Giovannoni G et al. N Engl J Med 2010;362:416–26 (and suppl. info).;
Acronyms: HE = High Efficacy, INJ = Injectables, KOL = Key Opinion Leader

Evobrutinib

Comprehensive development plan across immune-mediated diseases

Phase I/ Iia safety data-set	Robust phase II program to enable differentiated phase III	Est. primary completion
SLE (Ib) – **Safety** • **24 patients** • Double-blind, Randomized, Placebo-controlled Study	**RMS** • Randomized, double-blind, placebo-controlled study in **patients with RMS** • **267 patients** • **5 arms study:** placebo vs. 3 drugs-arms (low, mid, high dose) incl. **active control reference arm** (Dimethyl fumarate)	• **48 wks data** presented at AAN 2019 ✓ • **~96 weeks data** presented at **Evobrutinib Strategy Update** call in February 2020 ✓ • **Start of recruitment** in modified studies ✓ • **Detailed cinical data from 2+ years (RMS)** to be shared at a future scientific conference ✓ 108 week data presented at EAN 2020
	SLE • Randomized, double-blind, placebo-controlled **dose-ranging study** in subjects with SLE • **451 patients** • **4 arms study:** placebo vs. 3 drugs-arms (low, mid, high dose)	• **Study completed** ✓ Primary efficacy endpoint not met, development deprioritized • Data to be shared at a future conference
RA (IIa) – **Signal Finding** • **65 patients** • Randomized, double-blind, placebo-controlled trial in subjects with RA on stable Methotrexate therapy	**RA** • Randomized, double-blind, placebo-controlled **dose-ranging study** in subjects with RA • **360 patients** • **4 arms study:** placebo vs. 3 drugs-arms (low, mid, high dose)	• **Study completed** ✓ Primary efficacy endpoint not met, development deprioritized • Data to be shared at a future conference

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

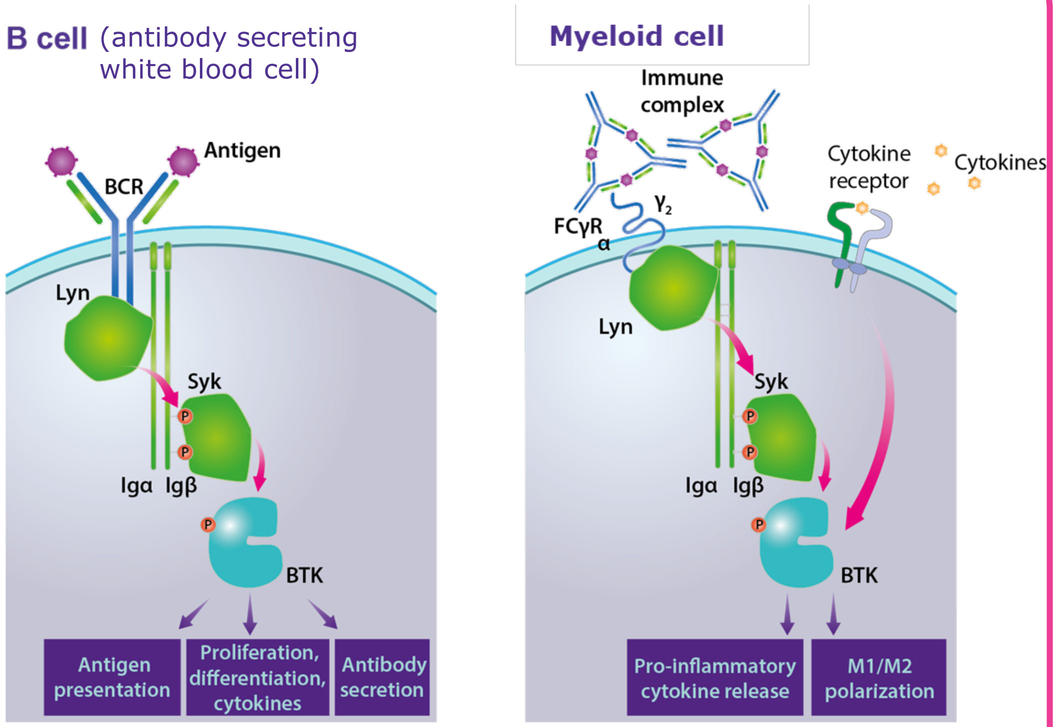
Evobrutinib

BTK inhibitor with a dual mode of action

Dual Mechanism of Action

- **Bruton's tyrosine kinase inhibitors (BTKi's)** are traditionally used in oncology but are now also **being evaluated in immunology**
- B-cell depletion studies have shown that antibody-independent **B-cell functions play an important role in MS pathogenesis** (development)[1-3]
- An **altered innate immune system contributes to progression in MS**[4,5]
- **Evobrutinib has a dual mode of action**, impacting on B-cells, macrophages and pathways involved in inflammation in MS; this has been confirmed in animal models[6-11]

Involvement of BTK in immune cell function



[1] Bar-Or A, et al. Ann Neurol 2010; [2] Fraussen J, et al. Autoimmun Rev 2016; [3] Jelcic I, et al. Cell 2018; [4] Rawji KS, et al. Front Cell Dev Biol 2016; [5] Vogel DY, et al. J Neuroinflammation 2013; [6] Data on file: EMD Serono M2951 Investigator's Brochure July 2015; [7] Haselmayer P, et al. EULAR 2016; [8] Data on file: EMD Serono Internal Study Report Aug 2012; [9] Alankus YB, et al. ECTRIMS 2018; [10] Torke S, et al. ECTRIMS 2018; [11] Boschert U, et al. ECTRIMS 2017

Evobrutinib (BTK-inhibitor)

Evobrutinib in RMS

Significant unmet medical need remains in RMS

Unmet needs in RMS ...	... addressed by Evobrutinib in RMS

Need for new mechanisms to control disease

- **Approx. 50% of patients with RMS continue to have ongoing disease activity** over 2 years even when treated with the most effective agents[1]
- Therapies addressing adaptive and innate pathobiology **peripherally and in the CNS**

Need for higher efficacy oral therapies

- 5 approved therapeutic classes considered "higher efficacy"[2], **only 2 of which are oral**
- No approved oral therapy with **efficacy on progression vs. an active control**

Opportunity to advance on benefit-risk

- **Systemic side effects** of therapies limit patient acceptance and compliance
- All approved higher efficacy therapies **associated with elevated risk of infection**

Well Tolerated, **no new safety signals** identified up to ~96 weeks

Long term exposure of Evobrutinib did **not result in increase of serious infections nor lymphopenia**, consistent with Evobrutinib's mechanism of action

Evobrutinib is **not associated with systemic side effects** (e.g. GI disturbances)

LFT elevations in a minority of patients restricted to first 6 months enabling patient management through appropriate monitoring

Comprehensive safety characterization based on exposure to Evobrutinib across RMS, RA and SLE studies

21,200 patient data base

2 years+ in RMS

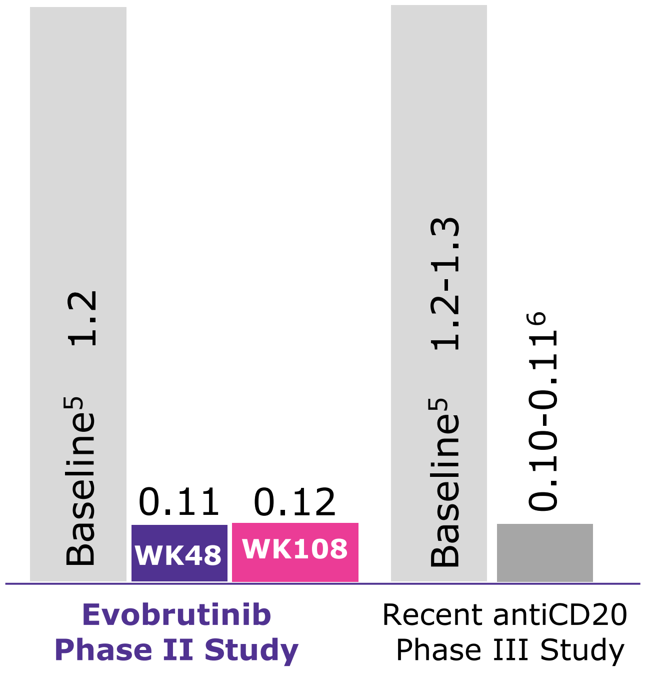
[1]Disease activity based on NEDA/No Evidence of Disease Activity; [2]5 Higher efficacy classes: VLA-4 (Natalizumab, IV), CD52 (Alemtuzumab, IV), CD-20 (Ocrelizumab, IV), S1PR (Fingolimod & Siponimod, Oral), Cd-ATP (Cladribine tablets, Oral); Acronyms: CNS = Central Nervous System, RMS = Relapsing Multiple Sclerosis

Merck KGaA
Darmstadt, Germany

108 weeks data from Phase II, presented at EAN 2020, confirms potential for mAb like efficacy with a rapid onset of action

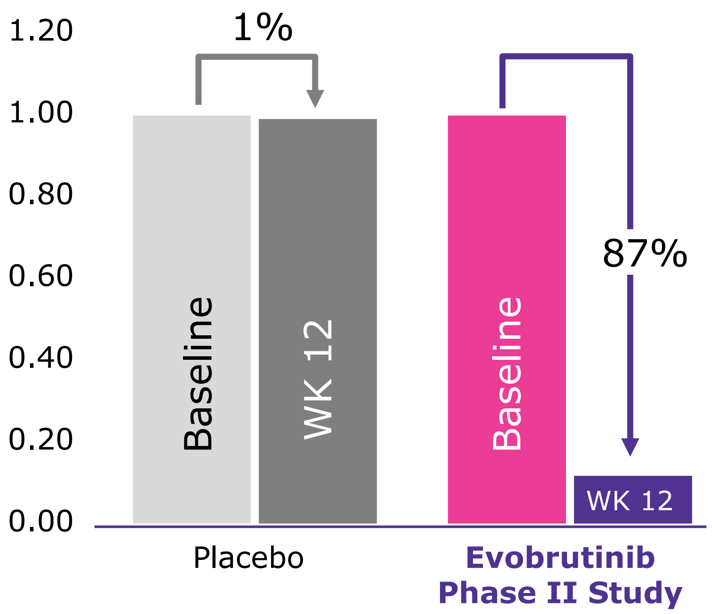
UPDATED DATA

"mAb like" Efficacy[4]



Annualized Relapse Rate

Rapid Onset of Action



Mean Number of T1 Gd+ lesions by visit[2] (Week 12 Indexed vs. Baseline)

Direct CNS and Peripheral Effects

- **Impacts B-Cells and Myeloid Cells,** which play a key role in the pathophysiology of MS
- **Crosses the blood-brain barrier[1]**
- Achieves **Brain BTKi occupancy[3]**
- **Potential to impact CNS** resident innate immunity as well as peripheral immune components

[1]Experiment in Healthy Mice (Data on file); [2]Exploratory analysis; [3]Boschert U et al. ECTRIMS 2017 [P678]; [4]Aspirational indirect comparison, no H2H studies performed; [5]Mean number of relapses in last 12 months; [6]Flexible duration, maximum duration for up to 30 months; Acronyms: BTKi = Bruton's Tyrosine Kinase inhibitor, CNS = Central Nervous System, mAb = monoclonal Antibody, EAN = European Academy of Neurology, Gd+ = Gadolinium Enhancing Lesions, WK = Weeks

Evobrutinib

mAb like efficacy data drives modification of Phase III study design

Initial Design

- Evobrutinib 48 wk data
- No data from H2H studies vs. Aubagio®

Modified Design

- Evobrutinib ~96 wk data
- Data from 2 H2H studies vs. Aubagio®

CIS + RRMS + aSPMS

Evobrutinib

Avonex®

Treatment period 96 Weeks

2 x Ph III

CIS + RRMS + aSPMS

Evobrutinib

Aubagio®

Treatment period 96 Weeks

2 x Ph III

Impact

- Studies vs Avonex® will be replaced by **2 new studies vs Aubagio®**
- **Fundamentally unchanged study design**, POS, and cost
- **Broad network of sites selected** for study vs. Avonex® ready to pivot to modified design
- Goal is to have **Phase III RMS data in-house in Q4 2023, and filing shortly thereafter**

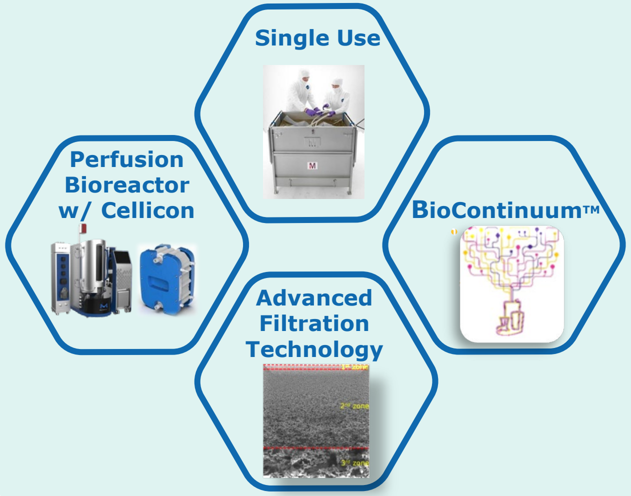
Acronyms: aSPMS = active Secondary Progressive Multiple Sclerosis, CIS = Clinically Isolated Syndrome, H2H = head-to-head, mAb = monoclonal Antibody, wk = weeks, POS = Probability Of Success, RRMS = Relapsing-Remitting Multiple Sclerosis; Avonex® is a registered trademark of Biogen; Aubagio® is a registered trademark of Sanofi

Strategic direction – innovate and invest today to continue above market growth in the future

	Traditional	All	Novel
Modality	TRADITIONAL	ALL	NOVEL
Revenue driver	Near term	Mid term	Long term
Offering	Products	Services	Products

Portfolio

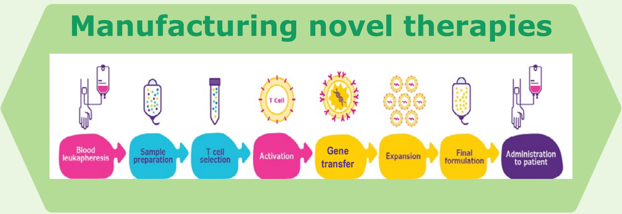
Traditional



All

- ✓ Contract development & manufacturing organization
- ✓ Contract testing organization
- ✓ Product characterization

Novel



- ✓ Templated viral manufacturing consumables and reagents
- ✓ Autologous manufacturing system

Capitalizing on three key life science trends

1 COMPLEX BIOLOGICS

Single Use / End to End
Opened Wuxi site in 2018, and expanded Danvers facility

Viral Vectors
Expanded Carlsbad viral vector manufacturing site in 2016; further doubling of capacity planned for 2021

Antibody Drug Conjugates (ADC)
Launched ADC Express™ for the rapid production of ADCs

2 DIGITAL UNIVERSE

#1 eCommerce site in Life Science[1]

- >90% of Millipore products on eCommerce platform
- x2 net sales growth of eCommerce vs. non-eCommerce[2]

3 ASIA

Manufacturing/Distribution
Nantong, Wuxi Single use

Commercial expansion
Tier 2 cities

eCommerce partnership
Alibaba Group 阿里巴巴集团

[1]measured by traffic, rated by external service SimilarWeb; [2]by business segment within Life Science

COVID-19 demands align with our strengths but increase supply chain pressure

unit operations		GE PALL	Thermo Fisher Scientific	SARTORIUS
Cell culture media	A leading player	A leading player	A leading player	Significant presence
Biopharm materials	A leading player	No offering	A leading player	No offering
Chromatography	A leading player	A leading player	Significant presence	Significant presence
Hardware	A leading player	A leading player	Significant presence	A leading player
Single use	Significant presence	A leading player	A leading player	A leading player
Sterile	A leading player	A leading player	No offering	A leading player
Virus	A leading player	A leading player	No offering	Significant presence
Clarification	A leading player	A leading player	No offering	Significant presence
Tangential flow filtration	A leading player	A leading player	No offering	A leading player

● = A leading player ● = Significant presence ● = No offering

Sources: press releases, company reports, and internal assessments

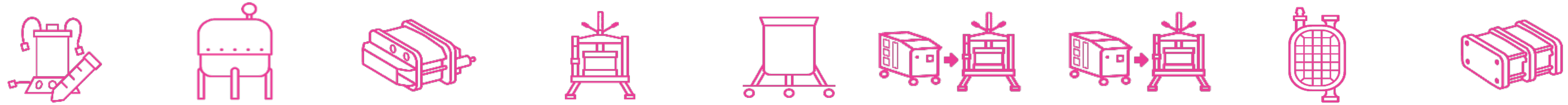
COVID-19 Outlook

Type		Implications
mAb	**65** programs **Bind and block** virus from entering cells	• Universal templates • A leading position for 8 out of 9 unit ops
Vaccine	**199** programs Protective **immune response**	• Multiple templates • Leveraging Single Use
Nucleic Acid	**43** programs Leveraging **human factory**	• Emerging manufacturing processes • Lipids are critical

Process Solutions

Next-generation bioprocessing on the cards

Today's process & portfolio



Launched 2018

Launched 2018

CHOZN Cell Line

Ex-Cell® Advanced™ media

Mobius® bioreactor

Clarisolve® Depth Filters

Eshmuno® Chrom. resin

Viresolve® Pro Solution

ProSep® Ultra Plus Resin

Opticap® Filters

Pellicon® Ultrafiltration Cassettes

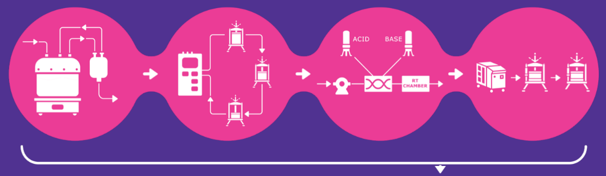
Durapore® Filtration

Millipak® Final Fill Filter

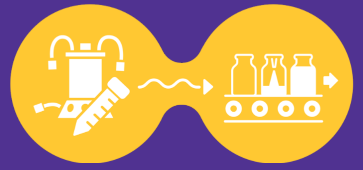
BioReliance ® | **cGMP SOLUTIONS & SERVICES** | **EMPROVE®**

Tomorrow's process

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

Process Solutions

Our single-use technologies drive flexibility in modern bioprocessing

30,000 l stain-less steel tank

500 l single-use tank

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 m²**

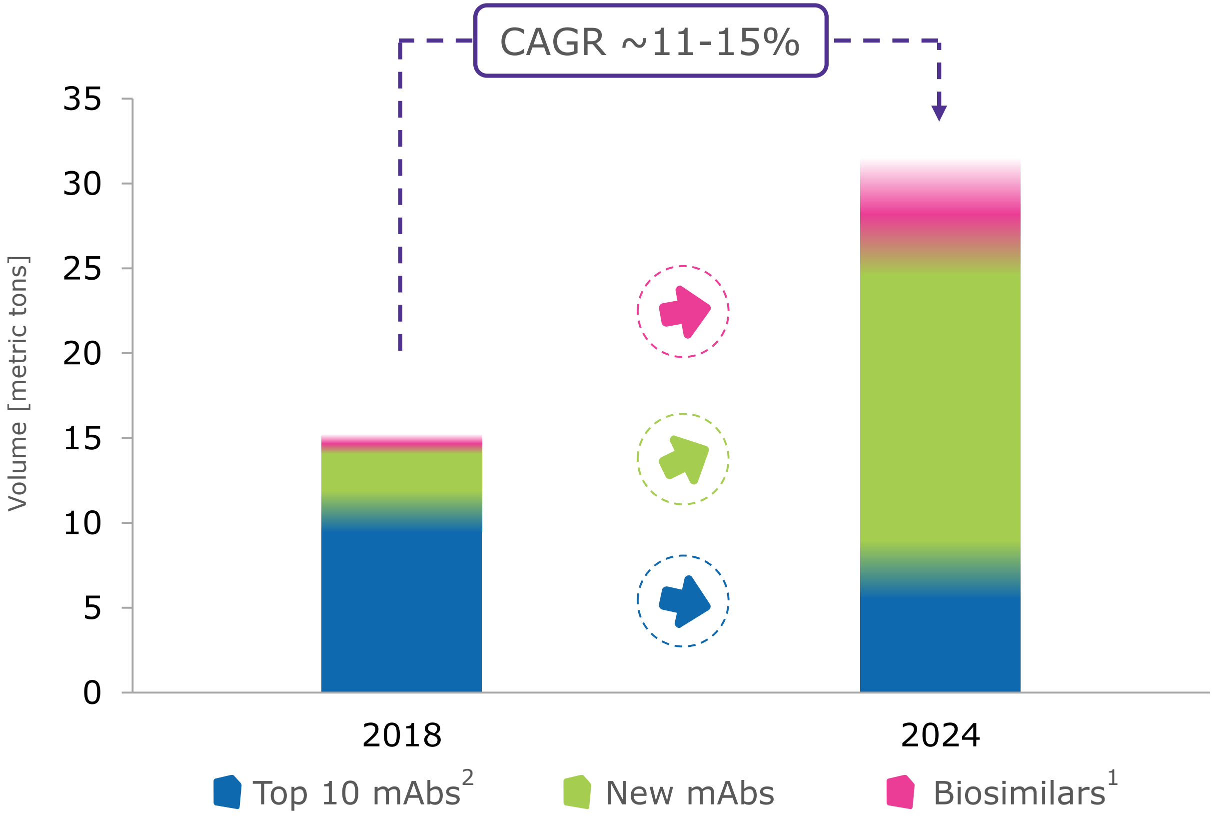
Innovative single-use facility	
CAPEX required	**$20 m to $100 m**
Time to construct	**1.5 years**
Change over time	**0.5 days**
Footprint	**~11,000 m²**

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



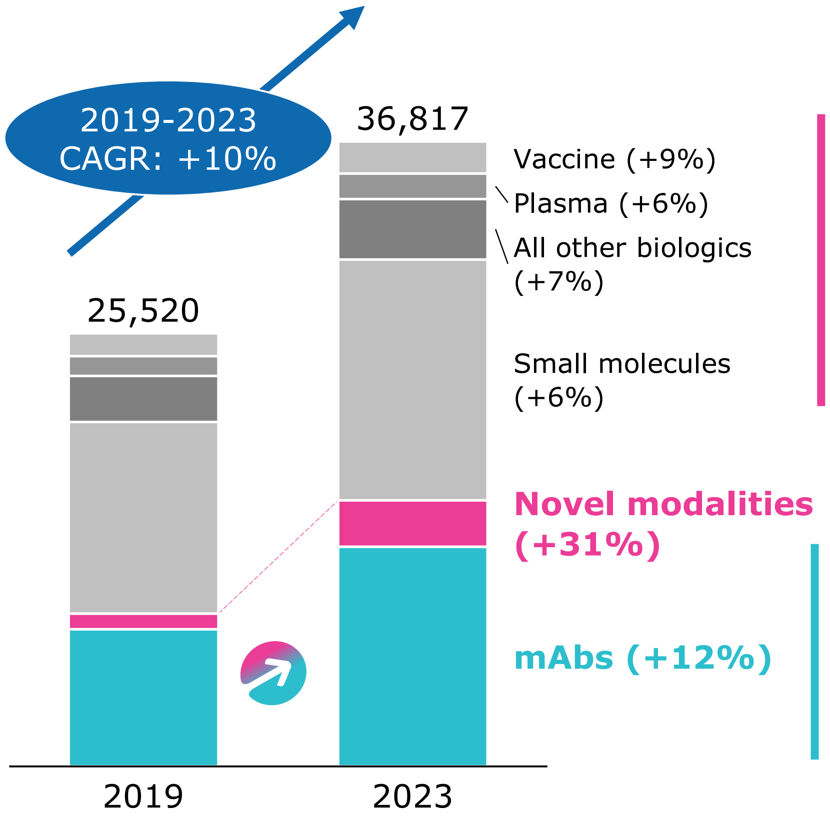
Market development

- 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

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

Proccess Solutions: Growth opportunities beyond mAbs

Growth potential by segment
Accessible market [€m], 2019-2023 CAGR[1]



- **Diversifying products and services** in line with the new modalities coming to the market: fusion biologics, viral and gene therapies, cellular therapies
- **Leading technologies:** investments over 15 years, 26 granted CRISPR patents
- **Services:** investments in CDMO capacity for Viral Vector Manufacturing, and HP-API

- **Leading technologies:** Single Use and BioContinuum™ for intensified and continuous bioprocessing
- **Services:** Contract manufacturing for biotechs at 3 global sites

Growth market - China

- **Half of world-wide early stage mAb market** by 2022
- **A leading country** in clinical trials

- **Increased investments** into **Nantong and Wuxi manufacturing sites**
- **China's first BioReliance® End-to-End Biodevelopment Center** opened in Shanghai in 2017

[1]Evaluate Pharma market research; Novel modalities include VGT, Cell Therapy and Stem Therapy; Acronyms: CDMO = Contract Development and Manufacturing Organization, CRISPR = Clustered Regularly Interspaced Short Palindromic Repeats, HP-API = Highly Potent Active Pharmaceutical Ingredients
ased on internal Life Science market research; TFF = tangential flow filtration

Applied Solutions

Broad offering across the dynamic cell and gene therapy value chain

understand

prove

deliver

Group 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

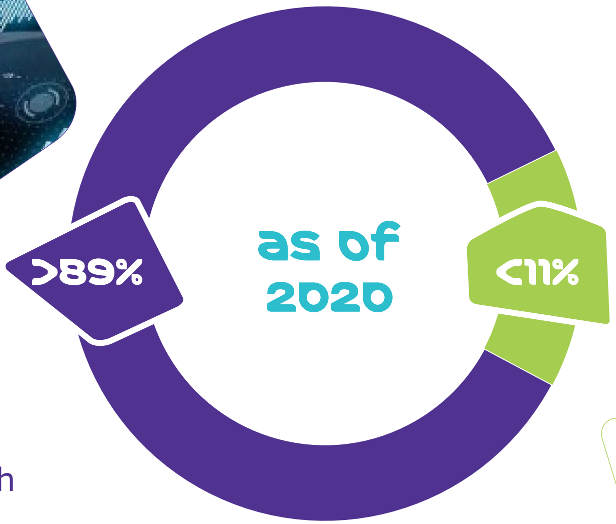
Merck KGaA, Darmstadt, Germany, is a supplier of novel products and services with a strong IP portfolio to meet the rapidly growing demand for novel therapies

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

Performance Materials targets attractive markets – especially in the electronics space

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

Performance Materials sales by end market



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

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

Performance Materials

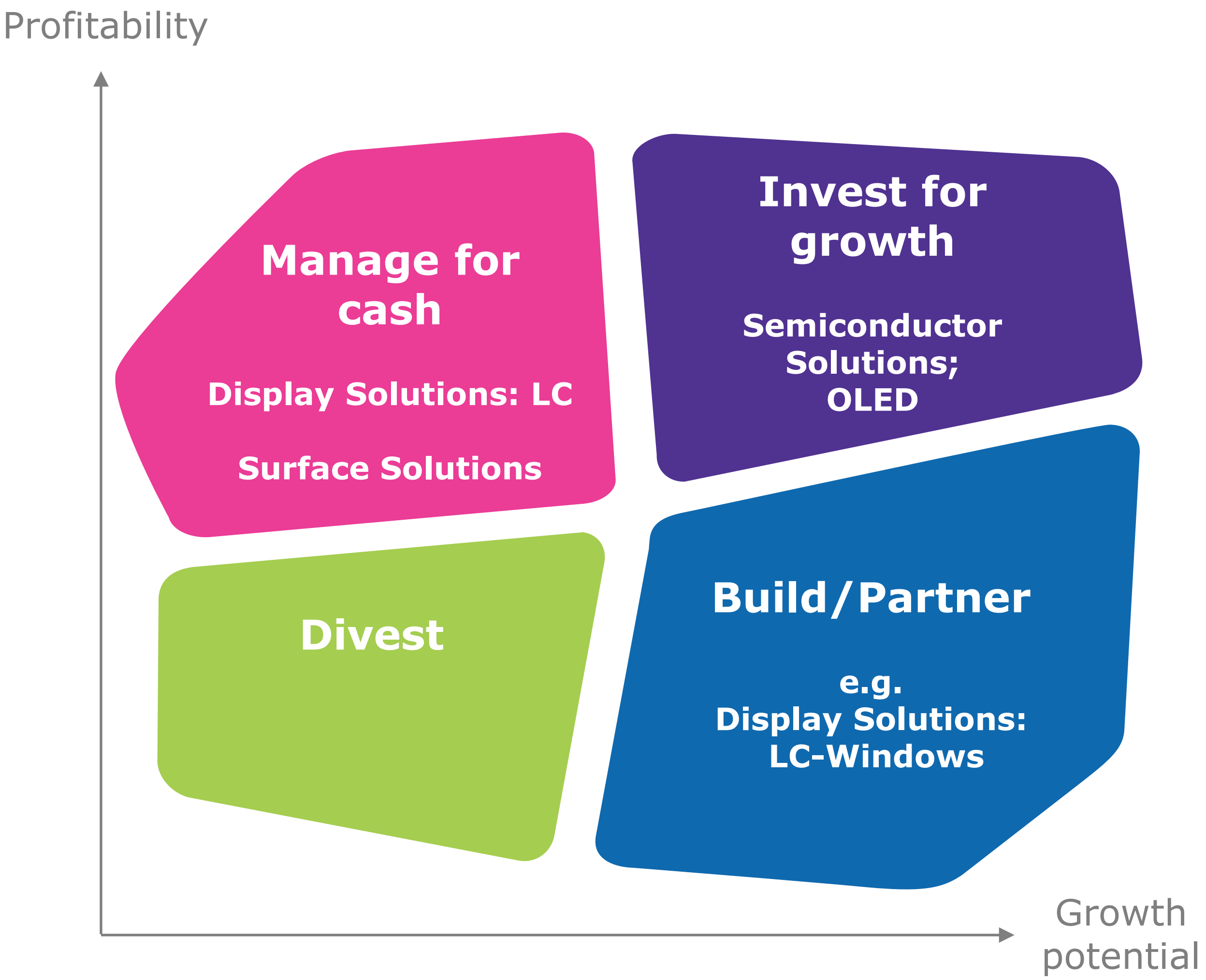
Three high-tech pillars serving a diverse customer base

Business allocation within Performance Materials	% of sales[1]	Products
		• Dielectrics, colloidal silica, lithography materials, yield enhancers, edge-bead removers • Polyimide raw materials, printing materials and specialty gases • Delivery equipment for gas, chemicals and CMP slurries, installation services and parts & support
		• Liquid crystals (LC) and photoresists for TVs, smartphones and tablet computers • Other display and non-display applications (e.g. LC Windows) • Organic and inorganic light emitting diodes
		• Effect pigments and functional materials for coatings, plastics, printing and cosmetics • Functional materials for cosmetics & special applications • Functional materials for electronics and energy solutions

[1] based on H1 2020

Performance Materials

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

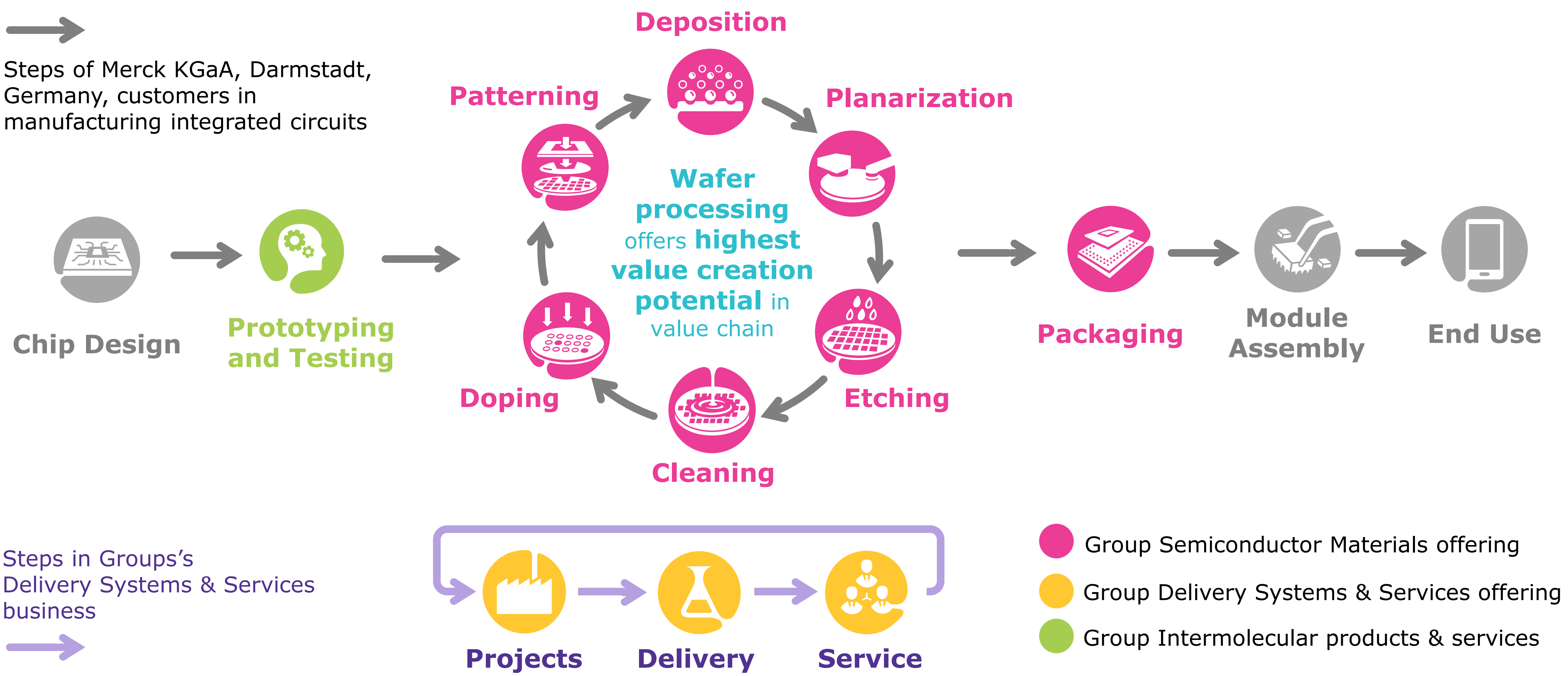
Build or Partner

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

Divest

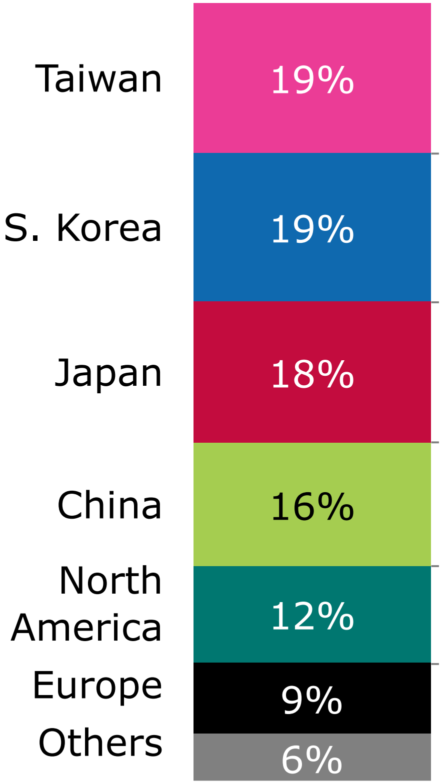
- Regular review for better strategic owner

Unique comprehensive products and services portfolio offers end-to-end solutions, well-placed in high growth segments



Beyond a comprehensive portfolio Semiconductor Solutions also has an industry spanning customer base, supplying various end markets

2019 wafer capacity by region[1]



Selected customers per region[2]

- Taiwan: TSMC, UMC
- S. Korea: Samsung Electronics, SK hynix
- Japan: KIOXIA, SONY
- China: SMIC, Yangtze Memory
- North America: intel, Micron
- Europe: ST life.augmented, Infineon

Semiconductor Solutions has

over 100 customers

supplying all top 10 chip makers and virtually all of the top 100[3]

- Focus on logic chips
- Focus on memory chips
- Focus on other chips

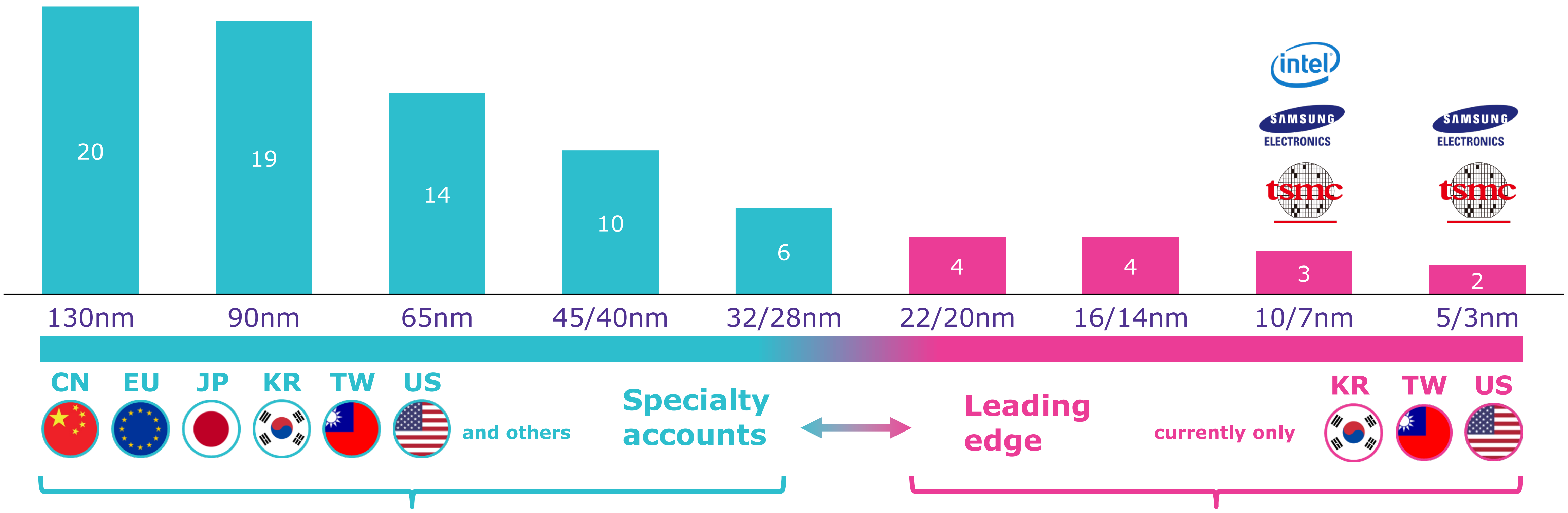
[1]SEMI World Fab Forecast Q3 2020 - Dec 2019 capacity,

[2]Representative, non-exclusive list, not based on any underlying criteria

[3]Based on H1 2020 Sales

Only three companies are currently running volume production <7nm
These companies have the largest market shares across all nodes

Number of companies currently running volume production per logic chip node[1]



Primary focus on operation efficiency

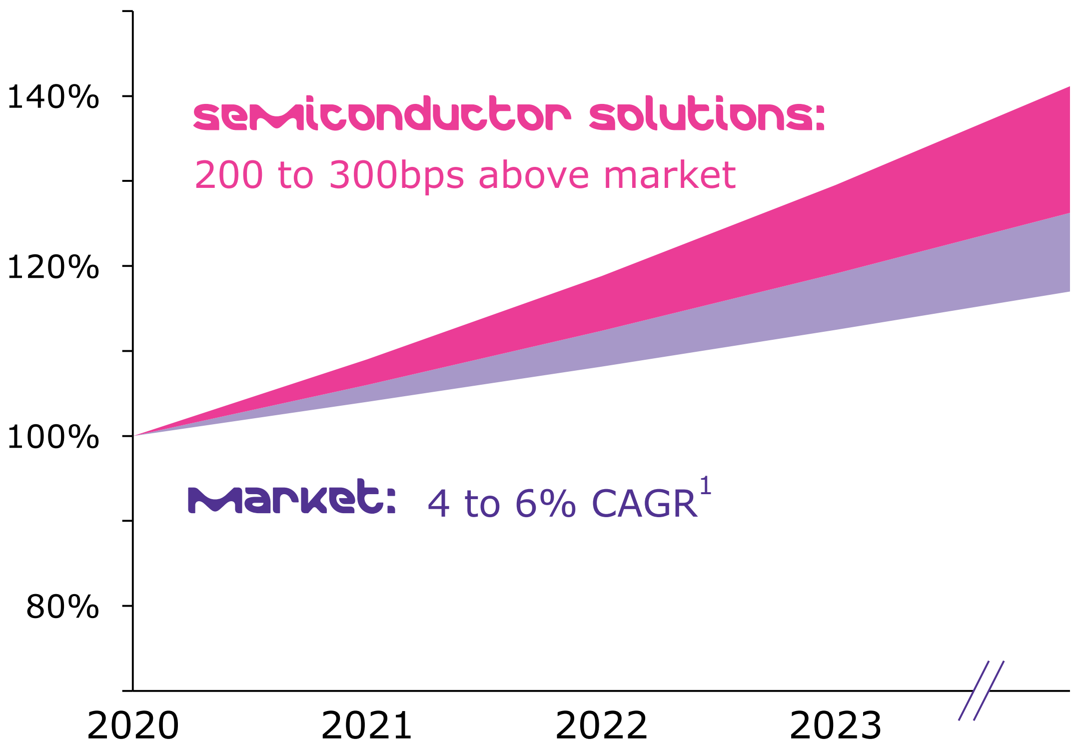
Primary focus on innovation efficiency

[1] Source: Wikichip.org and own data; volume production as of Sep 2020; countries are listed in alphabetical order

Semiconductor Materials

Set to outgrow highly attractive semiconductor materials market

Semiconductor Solutions sales guidance vs. market
[Indexed 2020 = 100%]



[1]Source: Jan 2020 IC Insights 2018-2024 CAGR for wafer starts in million units

market

- Technological trends inevitably drive **exponential data growth**
- More data requires **more chips** and **higher complexity of chips**
- **Rising materials value added** per wafer

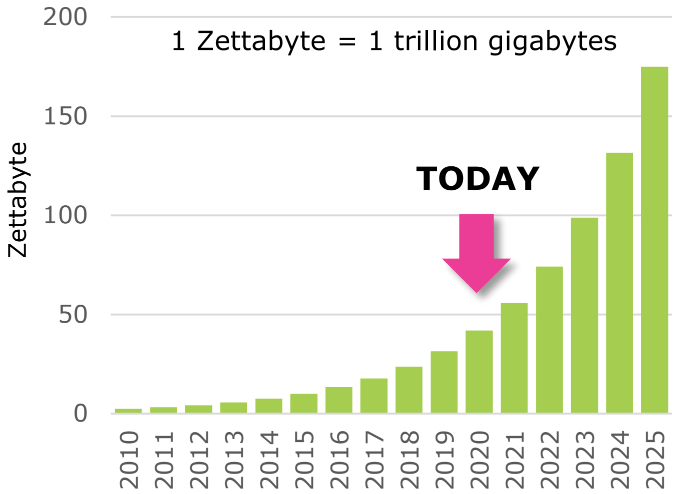
semiconductor solutions

- **Comprehensive offering** focusing on **attractive materials categories**
- Integration **topline synergies**
- **Critical mass** and deep **customer centricity**
  - ➢ Better customer understanding: know-how exchange and collaboration across **DS&S and Semiconductor Materials**
  - ➢ Cutting-edge innovation and **R&D capabilities**

Technology trends inevitably drive exponential data growth… …more chips needed to generate, transfer, process & store data

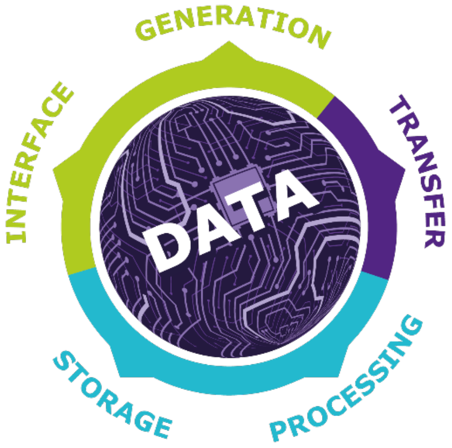
Data created worldwide is growing +30% annually

Size of global data sphere



Source: IDC DataAge 2025 Whitepaper

All segments of data application are affected by global data growth



Technology trends strongly impact relevance of data application segments

Technology market growth - examples

5G Technology[1]
>122% CAGR

Artificial Intelligence[2]
>33% CAGR

IoT Sensors[3]
>24% CAGR

Data Center Services[4]
>13% CAGR

Autonomous Driving[5]
>18% CAGR

Semiconductor Solutions supports growth trend as part of "**the company behind the companies**, advancing digital living"

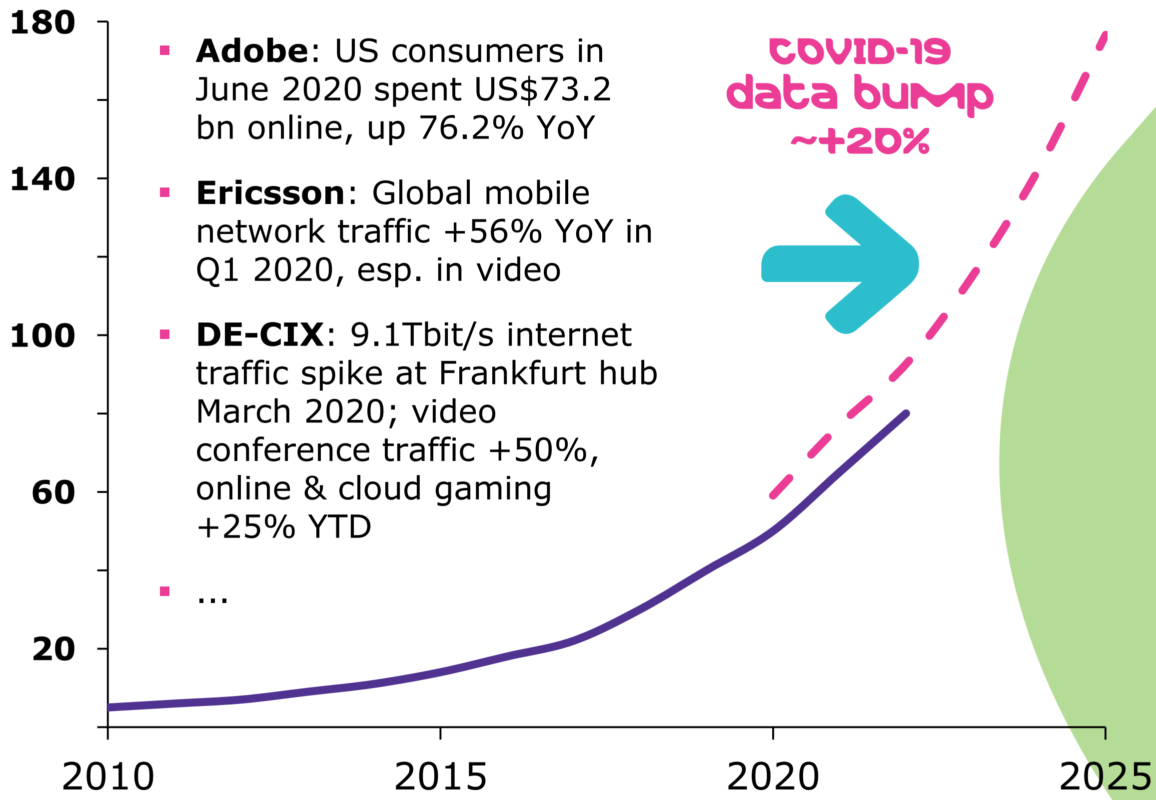
1) alliedmarketresearch.com, Prismark 2020, CAGR 2021-2026; 2) fortunebusinessinsights.com, post-gazette.com, CAGR 2018-2026; 3) mordorintelligence.com, computerweekly.com, CAGR 2020-2025; 4) mordorintelligence.com, Prismark 2020; CAGR 2020-2025; 5G = 5th-generation cellular wireless; IoT = Internet of Things 5) mordorintelligence.com, autonomous car market value CAGR 2020-2025

Semiconductor Solutions

COVID-19 has vaulted the "digital transformation" by ~5 years[1]

Expected COVID-19 impact on global datasphere[2]

[zetabytes]



- **Adobe**: US consumers in June 2020 spent US$73.2 bn online, up 76.2% YoY
- **Ericsson**: Global mobile network traffic +56% YoY in Q1 2020, esp. in video
- **DE-CIX**: 9.1Tbit/s internet traffic spike at Frankfurt hub March 2020; video conference traffic +50%, online & cloud gaming +25% YTD
- ...

COVID-19 impact on data growth expected to be positive

1
- Work-from-home/stay-at-home economy
- Significant increase in video conferences, online shopping, online gaming, streaming

2
- Change in consumers' and enterprises' digital behavior expected to be long-lasting

3
- Need for more, faster & more reliable data processing, storage and bandwidth
- Acceleration of semiconductor demand

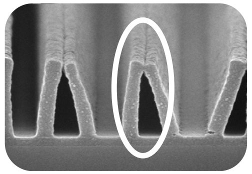
Semiconductor Solutions stands ready to support increased demand

[1] Source: McKinsey May 2020 "The COVID-19 recovery will be digital: A plan for the first 90 days";
[2] Source: Seagate, IDC April 2020, Merck KGaA, Darmstadt, Germany.

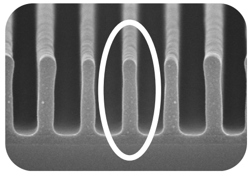
MERCK

Expanding the limits of how small you can go

Pattern collapse

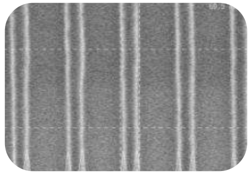


AZ® rinse materials

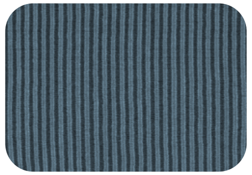


As lines get narrower and closer together in advanced chip generation, lines tend to “stick” due to surface tension.

Lithography limitation

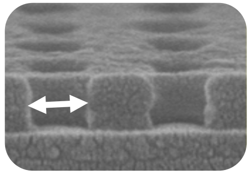


Directed self-assembly (DSA)

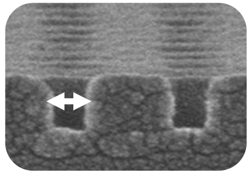


Block copolymer can generate small lines or contact holes by self-assembly. This allows miniaturization without expensive new equipment.

Wide features



AZ® shrink materials



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

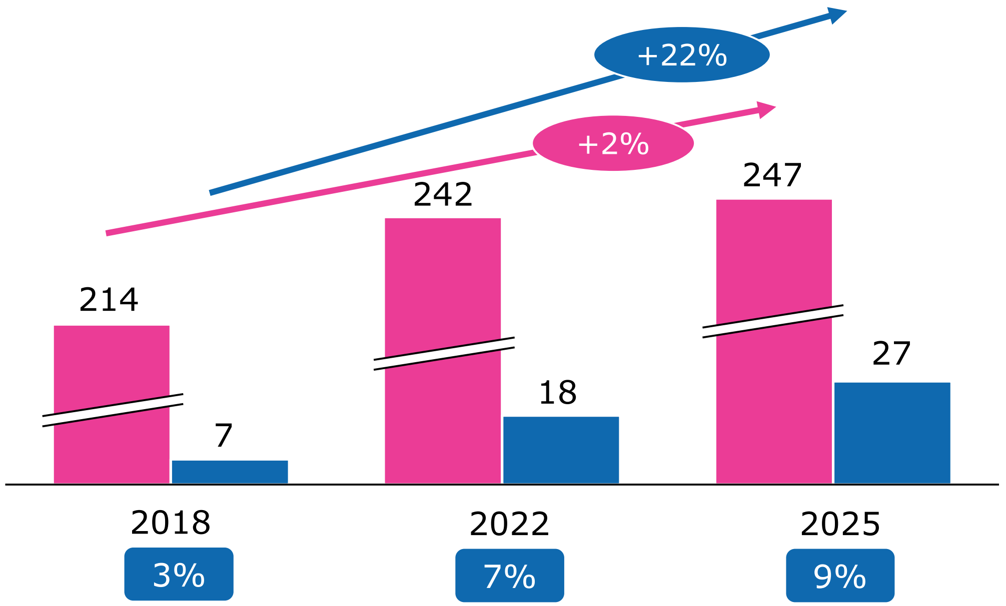
Merck KGaA, Darmstadt, Germany, delivers highly innovative solutions for complex customer problems

Performance Materials

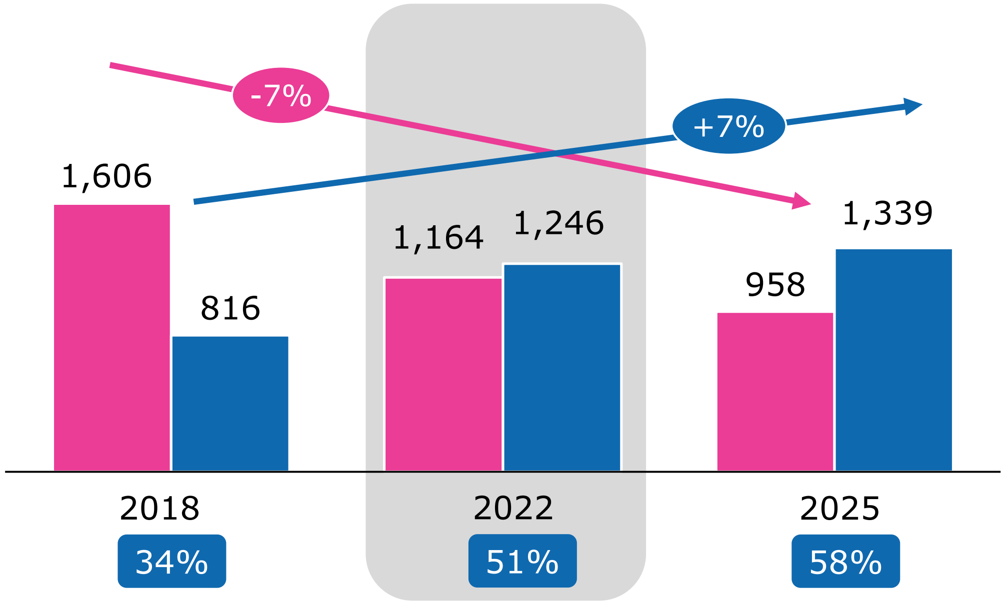
Display Solutions - OLED material market to exceed LC material market by 2022

x% OLED shipment area / addressable material market [in % of total] | Liquid Crystals | OLED

Display shipment area[1] [km²]



Addressable material market[2] [€m]



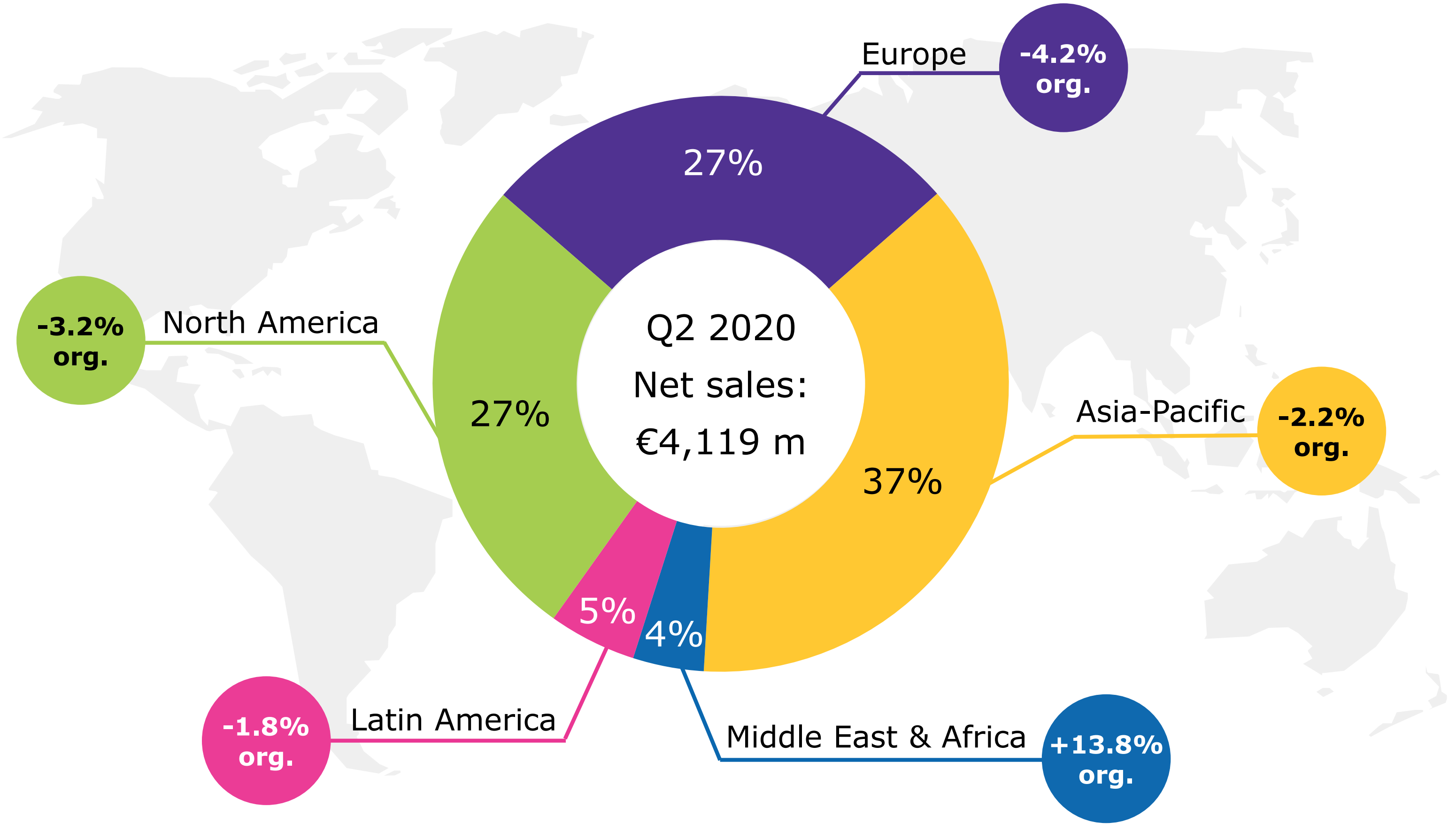
- **Continued growth** across all technologies
- **OLED growing faster than LCD,** but **LCD to command 90+% area share** for foreseeable future

- **Material value** per OLED display **higher** than in LCD
- **OLED material market** to **exceed LC material market by 2022**, but market split between **many more players**

[1]OMDSIA; [2]Internal Business Intelligence; Acronyms: LCD = Liquid-Crystal Display, OLED = Organic Light Emitting

All regions impacted by COVID-19; signs of recovery in APAC dragged down by Display Solutions & Fertility

Regional breakdown of net sales [€m]



Regional organic development

- Moderate decline in APAC as double-digit growth in Life Science and Semiconductor Solutions offset a large part of COVID-19-driven decline in Display, Fertility and Surface Solutions
- In Europe Neurology & Immunology as well as Research Solutions were also declining due to COVID-19
- North America saw significant declines in Research Solutions and Fertility, also Applied Solutions slightly down
- Strong General Medicine & Endocrinology growth in MEA and LATAM (where it could not fully offset effects of COVID-19 in Fertility)

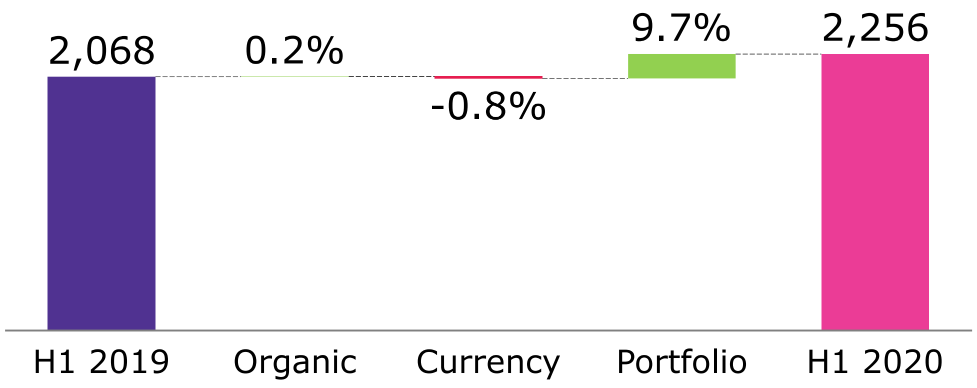
A strong Q1 and double-digit Q2 growth in Process Solutions and Semiconductor Solutions allow for overall organic growth in H1

H1 YoY Net Sales

	Organic	Currency	Portfolio	Total
Healthcare	3.2%	-1.4%	-0.5%	1.3%
Life Science	5.9%	0.2%	0.0%	6.2%
Performance Materials	-9.5%	2.1%	51.1%	43.7%
Group	**2.4%**	**-0.2%**	**7.7%**	**10.0%**

- Healthcare growing organically in H1 on the basis of a strong Q1 supported by resilient Oncology and General Medicine portfolio in Q2, overall June visibly stronger than May and April
- Accelerating Process Solutions growth is overcompensating flat Applied Solutions and declining Research Solutions where demand was impacted by COVID-19 related lockdowns
- Semiconductor Solutions organic growth accelerated from Q1 to Q2 – however, COVID-19 impact on Display and Surface Solutions results in overall organic decline

H1 YoY EBITDA pre



- EBITDA pre growing slower than sales organically, largely due to non-recurring Healthcare income (~ €185 m higher in H1 2019)
- Margin accretive Versum portfolio effect
- FX tailwinds from U.S. and Taiwan dollar did not fully offset currency headwinds from some emerging markets

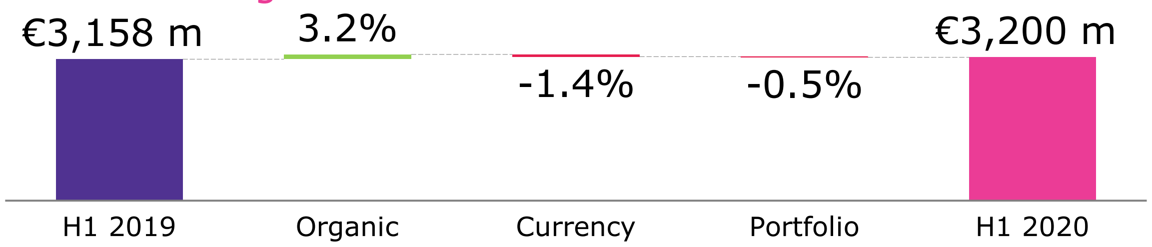
Totals may not add up due to rounding

Healthcare: Organic Growth in H1 based on a strong Q1 and a portfolio that showed resilience in the COVID-19 pandemic

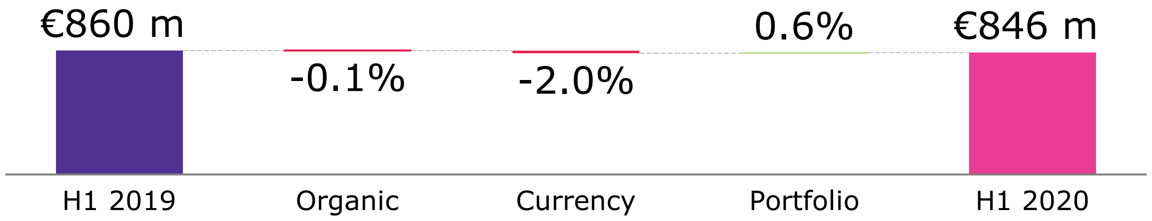
Healthcare P&L

[€m]	H1 2019	**H1 2020**
Net sales	3,158	**3,200**
Marketing and selling	-1,150	**-832**
Administration	-172	**-160**
Research and development	-775	**-783**
EBIT	473	**692**
EBITDA	852	**860**
EBITDA pre	860	**846**
Margin (in % of net sales)	27.2%	**26.4%**

Net sales bridge



EBITDA pre bridge



Comments

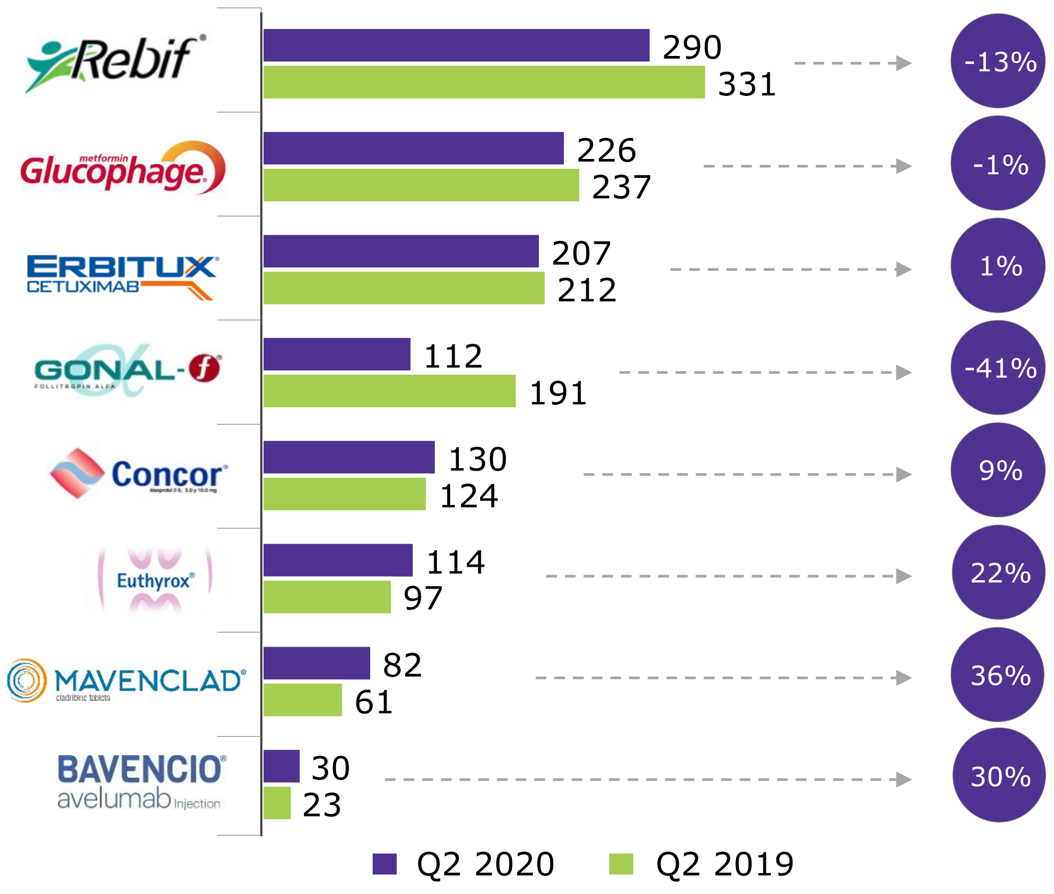
- Mavenclad® growth versus H1 2019, especially in U.S.; however declining sequentially due to COVID-19; recovery of ramp-up starting in June; Rebif® returning to underlying trajectory
- Fertility heavily impacted across all regions due to temporary shutdown of a majority of clinics
- Erbitux® growing organically slightly; Bavencio® growing strongly versus last year, but sequentially impacted by COVID-19
- M&S decrease due to rigorous cost management, further supported by suspension of face-to-face activities during COVID-19 pandemic versus elevated H1 2019 by now expired amortization of Rebif®
- R&D cost control offset by Bavencio® H&N study termination accrual (-€15 m)
- EBITDA pre declining faster than sales, driven largely by tough comps from Peg-Pal and Bavencio® milestones in Q2 2019

Totals may not add up due to rounding

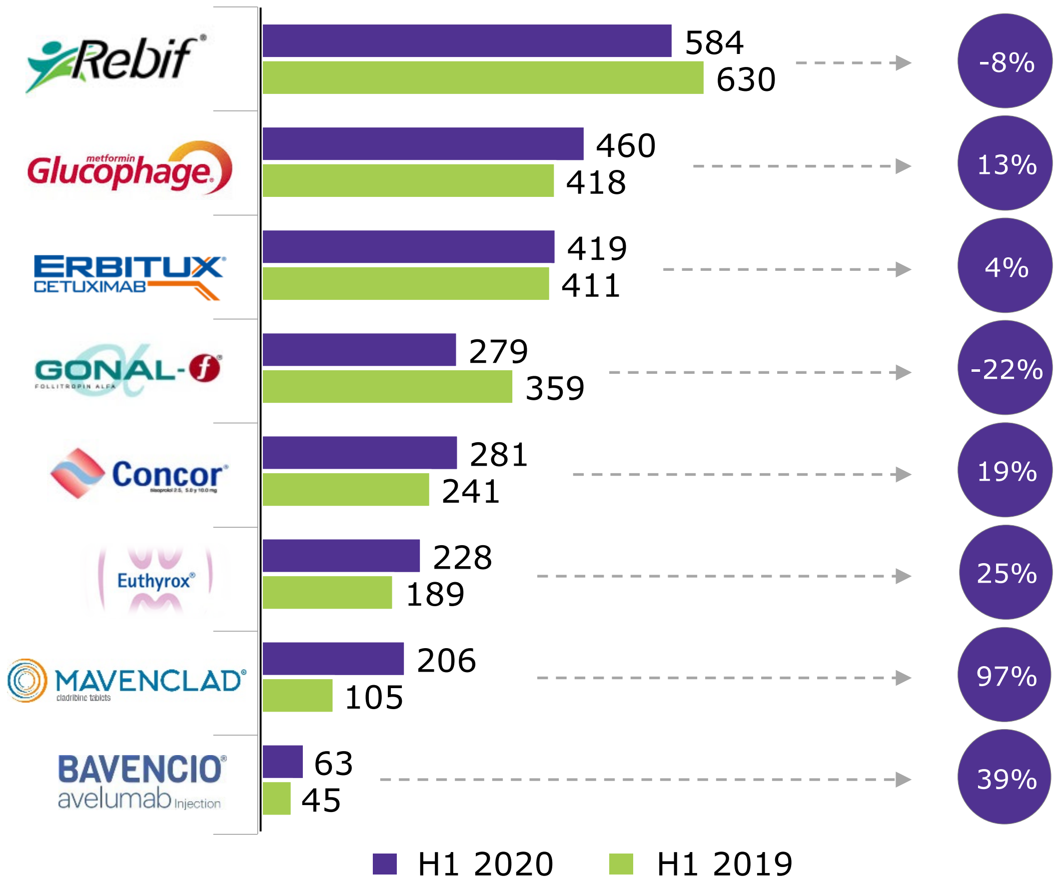
Merck KGaA
Darmstadt, Germany

Healthcare organic growth by franchise/product

Q2 2020 organic sales growth [%] by key product [€m]

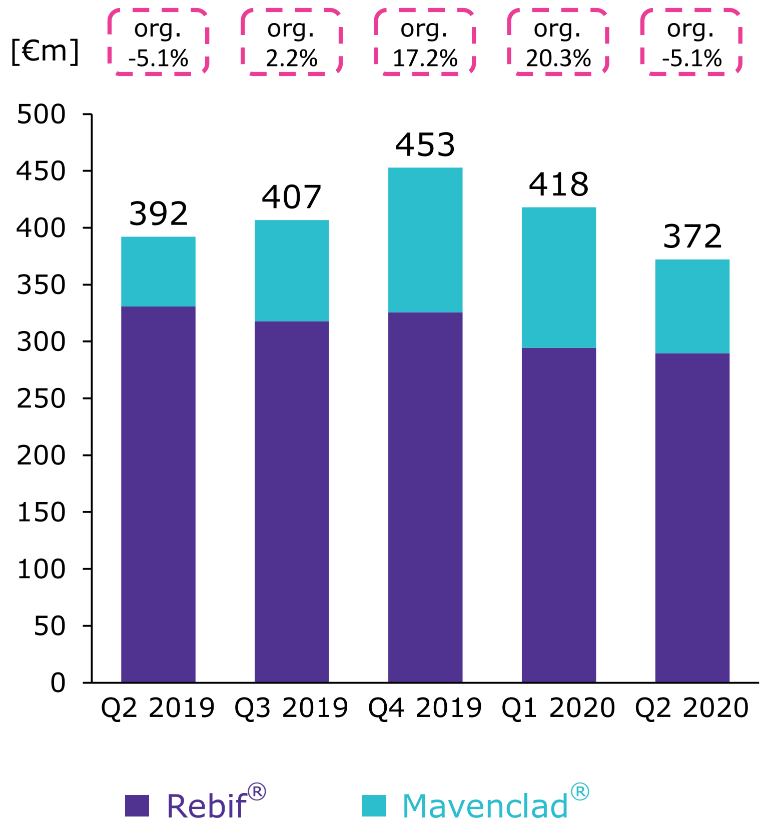


H1 2020 organic sales growth [%] by key product [€m]

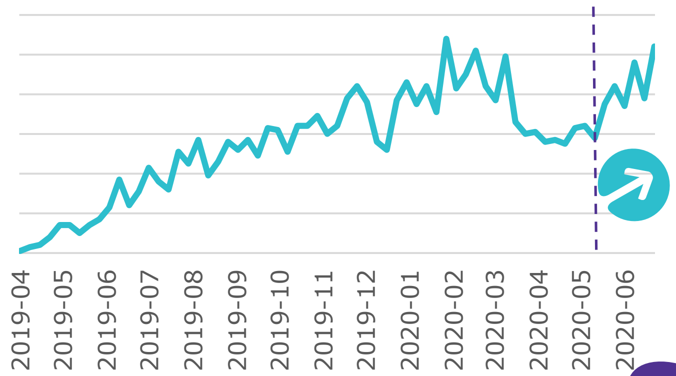


Neurology & Immunology: 7% organic growth in H1; paused Mavenclad® ramp-up showing signs of recovery in June

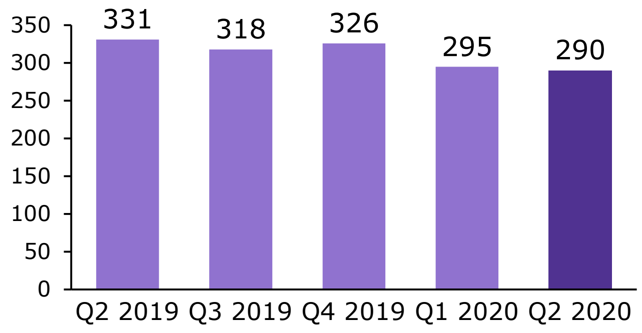
Sales development NDI, [€m]



Mavenclad® TRx, [IQVIA, NPA, weekly view]



Rebif® net sales, [€m]



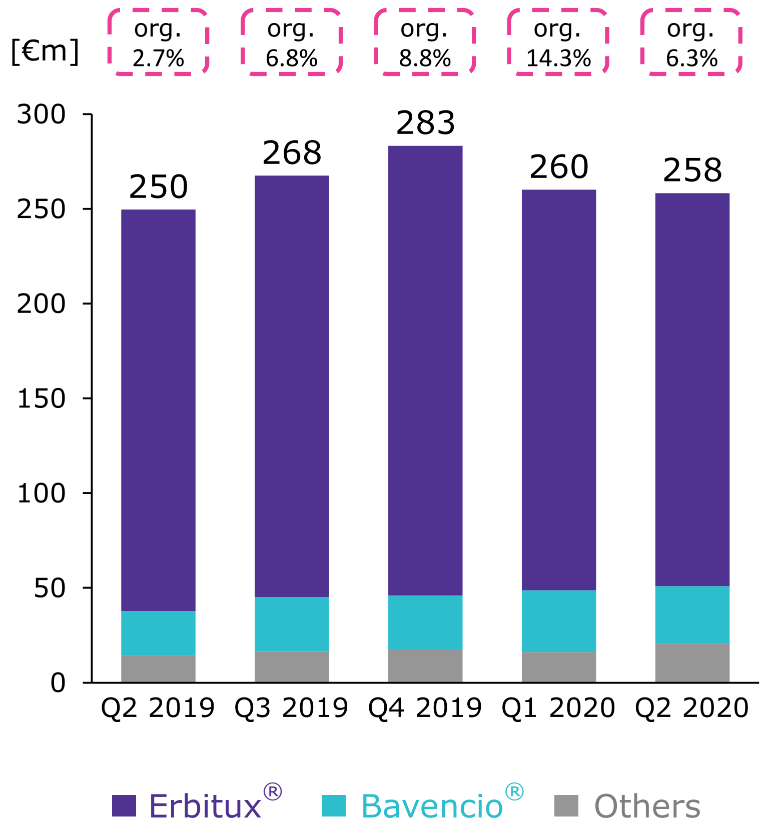
- Mavenclad® **recovery of ramp-up from peak COVID impact** visible starting in June
- Mavenclad® **continuing to gain market share** in High Efficacy (5.3%) and Oral classes (7.8%)

- Rebif® sales of €290m in Q2 '20 are returning to the anticipated underlying trajectory
- Stronger sequential decline vs. an elevated Q1 2020 due to U.S. inventory effects, and Russia tender phasing

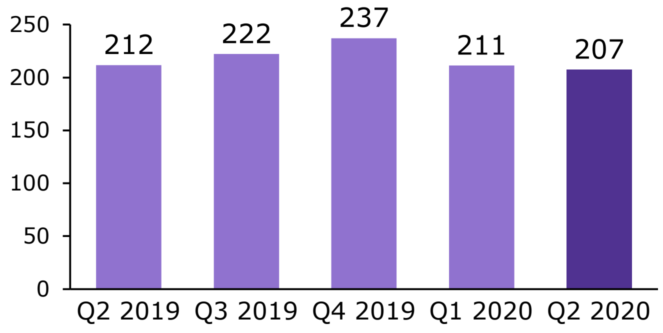
Merck KGaA
Darmstadt, Germany

Oncology: both Bavencio® and Erbitux® remain resilient despite impact from the COVID-19 pandemic

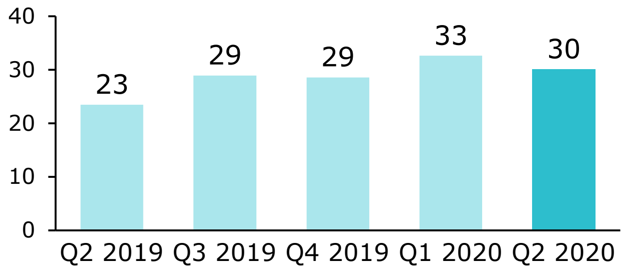
Sales development Oncology, [€m]



Erbitux® net sales, [€m]



Bavencio® net sales, [€m]

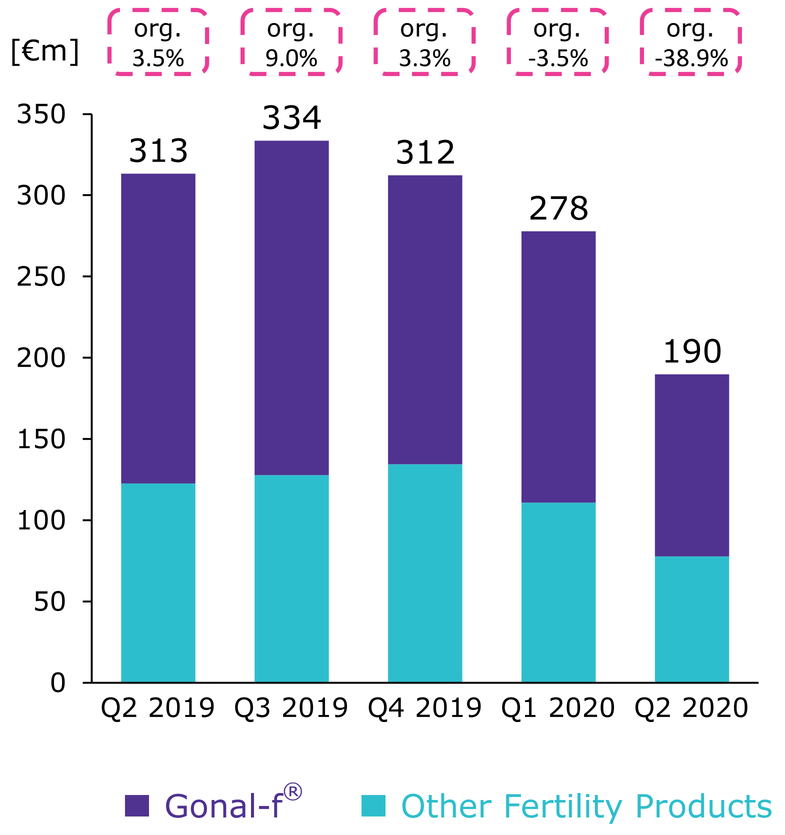


- Absolute sales of €207 m reflect a resilient growth of 1.1% in Q2
- Strong organic H1 growth of 23% in Latin America and moderate H1 growth of 3% in Europe despite COVID-19 was further supported by 3% H1 growth in MEA

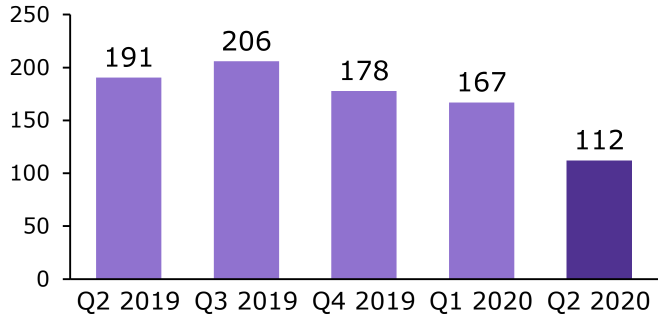
Bavencio® growing 30%; sequential ramp up momentum versus Q1 2020 impacted; largest opportunity will emerge in H1 2020 in UC 1L

Fertility: Strongest COVID-19 impact particularly in Europe and the U.S. given short treatment duration and temporary clinic shutdowns

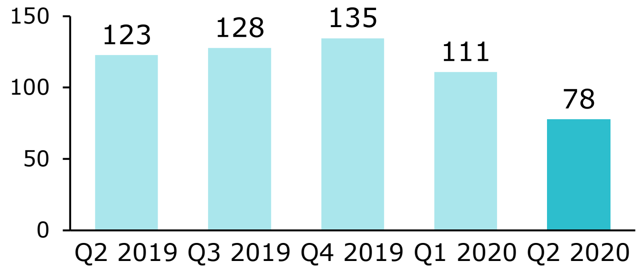
Sales development Fertility, [€m]



Gonal-f® net sales, [€m]



Other Fertility net sales, [€m]



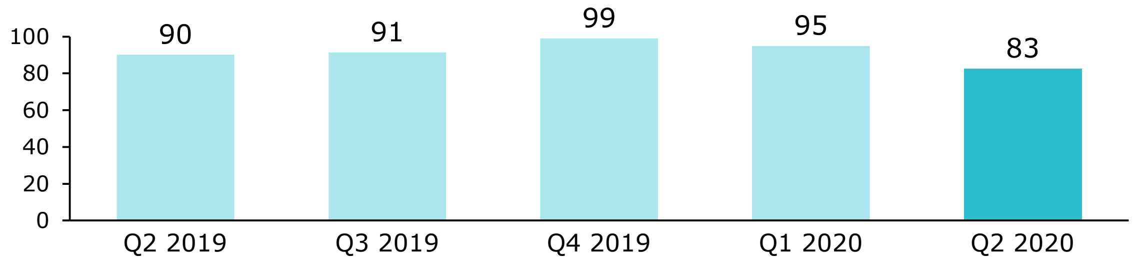
- Entire Fertility portfolio shows significant organic decline of -39% primarily from COVID-19 related temporary shutdowns of clinics combined with an innately short duration of treatment
- COVID-19 triggering 51% sales decline in Europe as clinics shut down due to the discretionary nature of the treatment
- Milder decline of 31% in APAC shows correlation with pandemic course, as China & others ahead of developments in Europe and U.S.

Merck KGaA
Darmstadt, Germany

General Medicine & Endocrinology: Growing organically overall despite COVID-19 impact in Q2 and a negative effect from Q1 pull-in

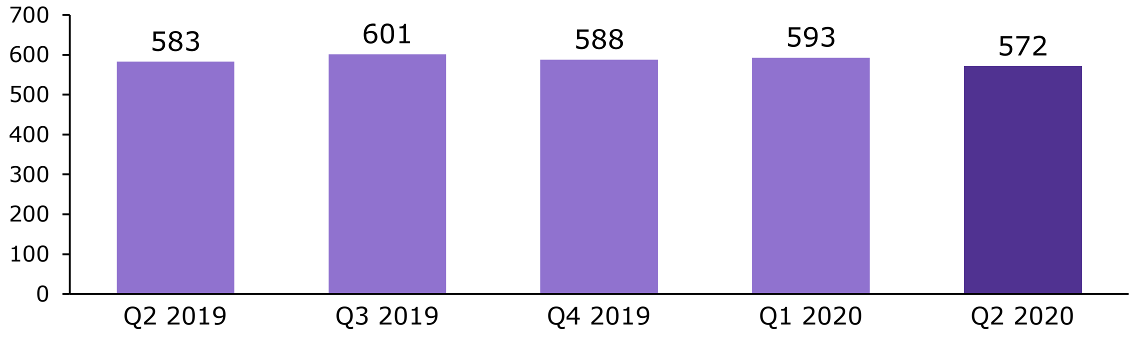
Sales evolution

[€m] Endocrinology



Organic
-5.4% org.

[€m] General Medicine*



Organic
+2.0% org.

Q2 2020 organic drivers

- Endocrinology was impacted in the U.S. and to a minor extent in Europe amid COVID-19 pandemic, while stable to growing in other regions
- While Glucophage® had a minor negative impact from the Q1 pull-in, Concor® saw ongoing strong demand globally, despite a VBP effect in China; leading to 2% growth overall for CardioMetabolic Care & General Medicine and Others

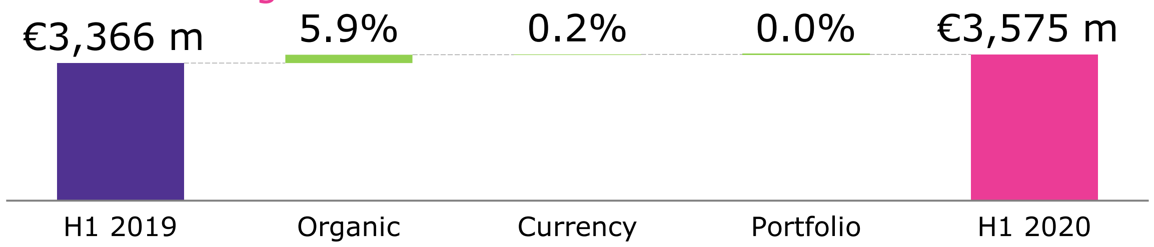
*includes CardioMetabolic Care & General Medicine and Others

Life Science: Strong resilience throughout H1; Process growing double-digit, Applied & Research impacted by COVID-19 but recovery visible in June

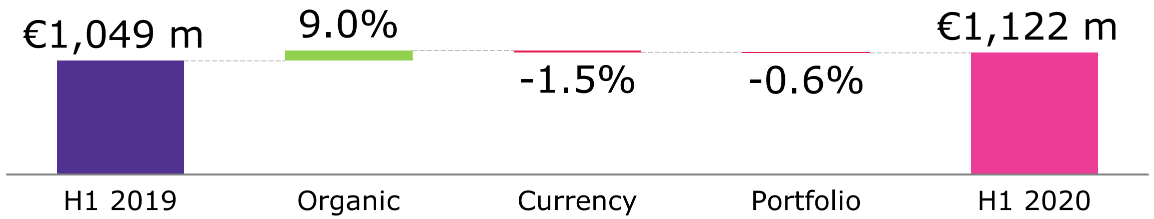
Life Science P&L

[€m]	H1 2019	**H1 2020**
Net sales	3,366	**3,575**
Marketing and selling	-959	**-986**
Administration	-156	**-189**
Research and development	-131	**-151**
EBIT	635	**731**
EBITDA	1,025	**1,126**
EBITDA pre	1,049	**1,122**
Margin (in % of net sales)	31.2%	**31.4%**

Net sales bridge



EBITDA pre bridge



Comments

- Double-digit organic growth of Process Solutions mainly driven by downstream and single use, with COVID-19 demand contributing
- Applied Solutions about stable due to COVID-19 related effects across the full portfolio, albeit clear signs of recovery in June
- Research Solutions impacted significantly mainly due to temporary slowdown in academia from COVID-19 related lab closures, also showing clear signs of recovery in June
- Higher M&S largely from increased freight costs, partially offset by overall cost-consciousness and lower travel expenses
- Admin increase driven largely by EBITDA pre adjustments (€21 m) and COVID-19 related cost for additional safety precautions
- Increased R&D driven by investments in strategic projects
- EBITDA pre growing faster than sales, reflecting operational leverage from strong top-line growth

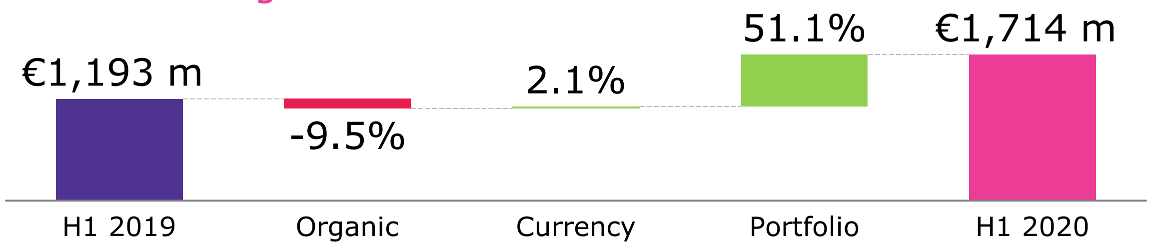
Totals may not add up due to rounding

Performance Materials: Versum portfolio effect and accelerating organic Semi growth compensate declining Display and Surface amid COVID-19

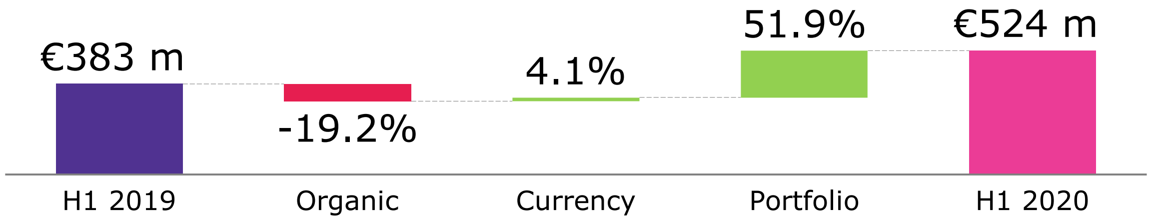
Performance Materials P&L

[€m]	H1 2019	**H1 2020**
Net sales	1,193	**1,714**
Marketing and selling	-132	**-270**
Administration	-49	**-83**
Research and development	-146	**-140**
EBIT	195	**86**
EBITDA	318	**470**
EBITDA pre	383	**524**
Margin (in % of net sales)	32.1%	**30.6%**

Net sales bridge



EBITDA pre bridge



Comments

- Sales growth of 44% reflects portfolio effect from Versum and positive FX, overcompensating organic decline in Display and Surface
- Semiconductor Solutions further accelerating strong organic growth, cyclical recovery started and outperformance continues
- Display Solutions: COVID-19 weighs on LC's negative underlying trajectory against still elevated comps in H1 2019; OLED also impacted
- Surface Solutions declining significantly driven by a heavy COVID-19 impact on automotive and cosmetic end markets
- M&S reflects consolidation of Versum acquisition and diligent underlying cost management as part of the Bright Future transformation
- R&D declining from an elevated H1 2019 base including Bright Future provisions (EBITDA pre adjustments); H1 2020 includes Versum consolidation and shows underlying Bright Future cost management
- Increase in EBITDA pre largely reflects consolidation effect from Versum, while EBIT lower due to sales impact in Display and Surface from COVID-19, higher D&A from Versum PPA and impairments

Totals may not add up due to rounding

Reported figures

Reported results

[€m]	H1 2019	H1 2020	Δ
EBIT	997	**1,207**	21.0%
Financial result	-174	**-201**	15.6%
Profit before tax	824	**1,006**	22.2%
Income tax	-203	**-259**	27.5%
Effective tax rate (%)	24.7%	**25.8%**	1.1pp
Net income	659	**746**	13.1%
EPS (€)	1.52	**1.72**	13.2%

Comments

- EBIT increase driven by Versum portfolio effect and Life Science growth, partially offset by lower non-recurring income, higher depreciation & amortization from Versum PPA and impairments in Performance Materials
- Financial result impacted by LTIP and higher interest expenses related to Versum financing
- Effective tax rate within guidance range of ~24-26%
- Higher net income and EPS reflect higher EBIT

Totals may not add up due to rounding

Cash flow statement

H1 2020 – cash flow statement

[€m]	H1 2019	H1 2020	Δ
Profit after tax	660	**747**	87
D&A	927	**991**	64
Changes in provisions	54	**-38**	-92
Changes in other assets/liabilities	-115	**-189**	-74
Other operating activities	-55	**-24**	31
Changes in working capital	-236	**-468**	-232
Operating cash flow	1,235	**1,019**	-216
Investing cash flow	-1,199	**-504**	695
thereof Capex on PPE	-367	**-532**	-164
Financing cash flow	1,241	**239**	-1,001

Cash flow drivers

- Profit after tax driven by higher EBIT
- Higher Depreciation & Amortization from Versum PPA and impairments in PM
- Changes in provisions reflect reduced litigation provisions and fluctuations in LTIP*
- Changes in other assets and liabilities primarily driven by a GSK upfront payment in H1 2019 that was deferred
- Increased working capital driven by Versum consolidation, higher inventories to secure supply in the face of COVID-19 and growing receivables
- Investing and Financing cash flows returning to normal levels

*Long Term Incentive Plan

Totals may not add up due to rounding

Regular portfolio review remains key to success

Strong track record

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

Defining portfolio guard rails

- Three strong pillars with no business marginalized
- Leading market position in attractive markets
- Focus on innovation and sustainability through science and technology

Clear financial M&A criteria

- Supporting profitable growth strategy
- IRR > WACC
- EPS pre accretive
- Maintain investment grade rating

Current set-up is strong and organic investment opportunities are attractive

Expect to regain financial flexibility by 2022 to pursue external growth opportunities

Targeted and more regular bolt-on approach more likely than large transformative deals

Adjustments in H1 2020

Adjustments in EBIT

[€m]	H1 2019		H1 2020	
	Adjustments	thereof D&A	Adjustments	thereof D&A
Healthcare	8	0	**-12**	2
Life Science	24	0	**-4**	0
Performance Materials	65	0	**165**	112
Corporate & Other	44	0	**25**	0
Total	141	0	**174**	114

ESG

We are working on ambitious goals

environment

Climate

We endeavor to reduce direct and indirect emissions to mitigate our impact on the climate.

Waste

We consider it fundamental to both prevent and recycle as much of our waste as possible.

Water

For us, sustainable water management means not negatively impacting the aquatic ecosystems

social

Product safety

Product safety is one of our top priorities: From safe handling of hazardous substances to ensuring patient safety.

Employees

We aim to be an attractive employer, encouraging creativity and development under ideal working conditions.

Access to Medicine

We support a variety of initiatives that improve access to health particularly for people in low- and middle-income countries.

governance

Growth & Profit sharing

Our growth results from innovations and acquisitions strengthening our position in important markets, supported by strong cash-flow, long-term margins of >30% and a conservative but reliable dividend.

Risk management

We are focusing on a diversified business model: Our 3 sectors have pioneering knowledge to develop products to improve life for patients, further the success of our customers and meet global challenges.

Steering

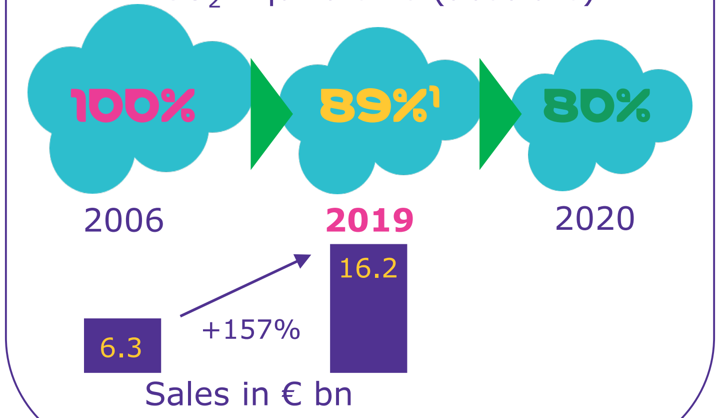
Our core values along with the external regulations lead to business-guiding charters and principles for our responsible governance, documented in our Corporate Responsibility strategy and report.

Emissions, Water, Waste reduced despite growing business

Emission-Target:

- Growth-independent reduction of Group's greenhouse gas emissions of 20% until 2020 vs. 2006
- Despite sales growth of 137% 2006 vs. 2018 we achieved a 11% reduction of CO_2 equiv.
- We still confirm our goal for 2020 expecting positive impact from latest initiatives, e.g. process optimizations and change to renewable energy

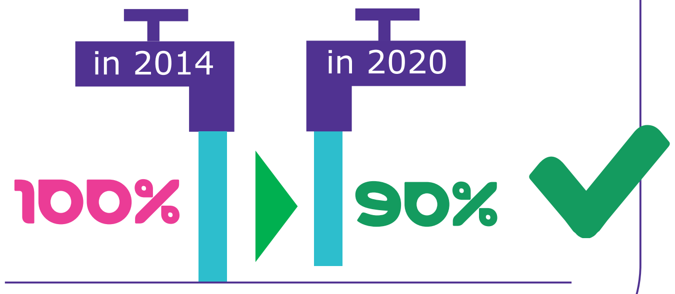
CO_2-Equivalents (absolute)



Water-Target:

- At 24 sites with relevant water use in areas of high water stress we aim to cut water consumption by 10% until 2020 vs. 2014
- 2018, we lowered our water consumption by 11% resulting from sustainable water management and re-usage
- All pharmaceutical manufacturing facilities have wastewater treatment plants

Water consumption
in water stress areas

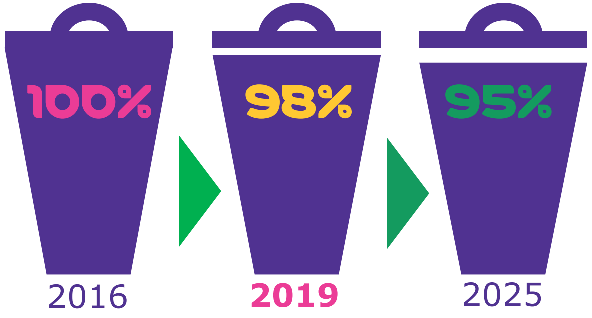


2019: -21%

Waste-Target:

- We reduce waste and recycle as much as possible - we aim to reduce the environmental impact of our waste by 5% until 2025 compared to 2016
- The Company Waste Score allows us to compare the amount of waste our sites are producing
- We ensure that raw materials are recycled and that unrecyclable waste is discarded

Group Waste Score



[1]The figures exclude Versum Materials since the integration process is still underway. Based on the figures Versum Materials reported for the previous two years (not calculated in accordance with our metrics), we expect this to add roughly 1.3 million metric tons of CO_2eq per year to our carbon footprint.

External stakeholders valuate our engagement

MSCI rated Merck KGaA, Darmstadt, Germany, AAA (Leader) according to its exposure to ESG risks and how well they manage those risks relative to peers.

Sustainalytics put us among the **leading pharmaceutical companies**

Since 2008, Merck KGaA, Darmstadt, Germany, is part of **FTSE4Good Index**, measuring the performance of companies with strong ESG practices (Top 15).

In 2019, **ISS Oekom** rated Merck KGaA, Darmstadt, Germany "B-" which means Merck KGaA, Darmstadt, Germany has once more achieved **prime status.**

In 2019, the Merck KGaA, Darmstadt, Germany share was again **included in STOXX Global ESG Leaders Index**, a sustainability index based on key environmental, social and governance criteria.

Merck KGaA, Darmstadt, Germany has been **reconfirmed** as a constituent of the Ethibel Sustainability Index (ESI) Excellence Europe since May 2020, based on VigeoEiris.

Merck KGaA, Darmstadt, Germany received **Platinum** status in 2020, among the **top 1% of companies**.

EcoVadis annually examines ~60,000 suppliers from 155 countries.

Participation in CDP (formerly Carbon Disclosure Project) since 2008.
CDP Climate: In 2019, we scored "C" (2018: C).
CDP Water: In 2019 we received a "B" (2018: B-).

In the **2018 Access to Medicine Index** Merck KGaA, Darmstadt, Germany maintained **4th place.** The ranking appreciates Merck´s initiatives e.g. the commitment to open innovation.

Financial calendar

Date	Event
September 25, 2020	Healthcare R&D Update Call
November 12, 2020	Q3 2020 Earnings release
March 4, 2021	Q4 2020 Earnings release

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Darmstadt, Germany

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