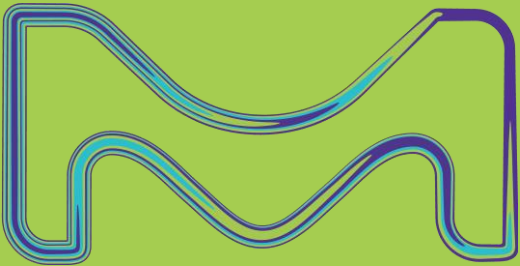


Merck KGaA, Darmstadt, Germany

# Q2 21 Roadshow

**Investor Relations**

August 2021



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Risks and uncertainties include, but are not limited to: the risks of more restrictive regulatory requirements regarding drug pricing, reimbursement and approval; the risk of stricter regulations for the manufacture, testing and marketing of products; the risk of destabilization of political systems and the establishment of trade barriers; the risk of a changing marketing environment for multiple sclerosis products in the European Union; the risk of greater competitive pressure due to biosimilars; the risks of research and development; the risks of discontinuing development projects and regulatory approval of developed medicines; the risk of a temporary ban on products/production facilities or of non-registration of products due to non-compliance with quality standards; the risk of an import ban on products to the United States due to an FDA warning letter; the risks of dependency on suppliers; risks due to product-related crime and espionage; risks in relation to the use of financial instruments; liquidity risks; counterparty risks; market risks; risks of impairment on balance sheet items; risks from pension obligations; risks from product-related and patent law disputes; risks from antitrust law proceedings; risks from drug pricing by the divested Generics Group; risks in human resources; risks from e-crime and cyber attacks; risks due to failure of business-critical information technology applications or to failure of data center capacity; environmental and safety risks; unanticipated contract or regulatory issues; a potential downgrade in the rating of the indebtedness of Merck KGaA, Darmstadt, Germany; downward pressure on the common stock price of Merck KGaA, Darmstadt, Germany and its impact on goodwill impairment evaluations as well as the impact of future regulatory or legislative actions.

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# Agenda

- 01 Business overview**
- 02 Transforming the company**
- 03 Healthcare – Executing on the earnings phase**
- 04 Life Science – Focusing on profitable growth**
- 05 Electronics – Leveraging portfolio shift**
- 06 Sustainability**
- 07 Guidance & executive summary**



# business overview

01

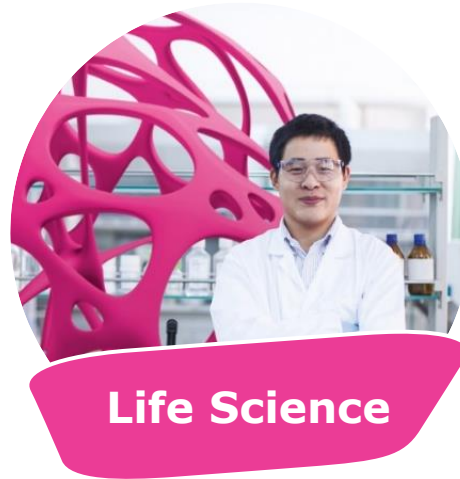
## Group

### Three high-tech businesses competing in attractive markets



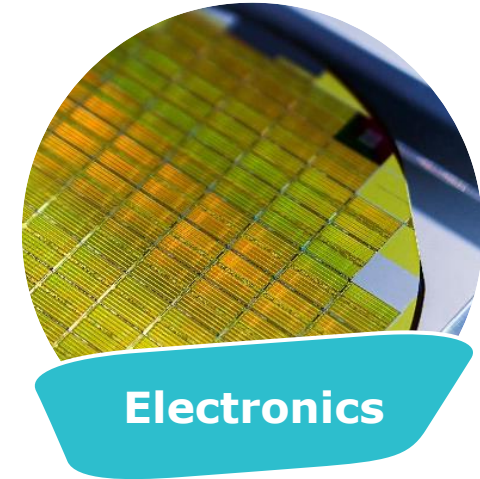
Leading in specialty  
pharma markets

- 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



Leading life science  
company

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



Leading company in  
high-tech solutions

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

Group

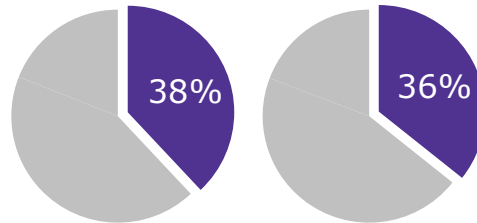
## Group today – three strong pillars as basis for profitable growth

FY 2020 contribution to<sup>1</sup>

Sales

EBITDA pre

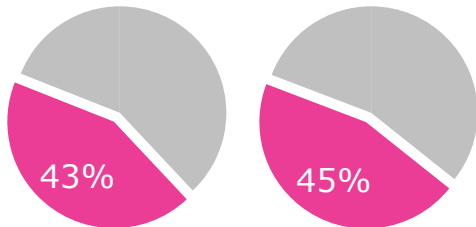
### 1. Healthcare



**Global specialty innovator** poised for above-industry growth

- **Resilient base 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

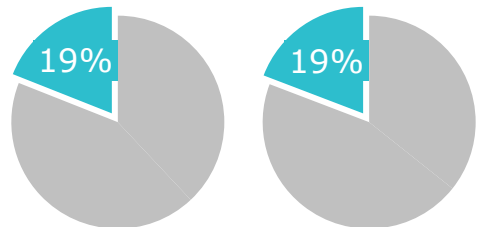
### 2. Life Science



**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. Electronics



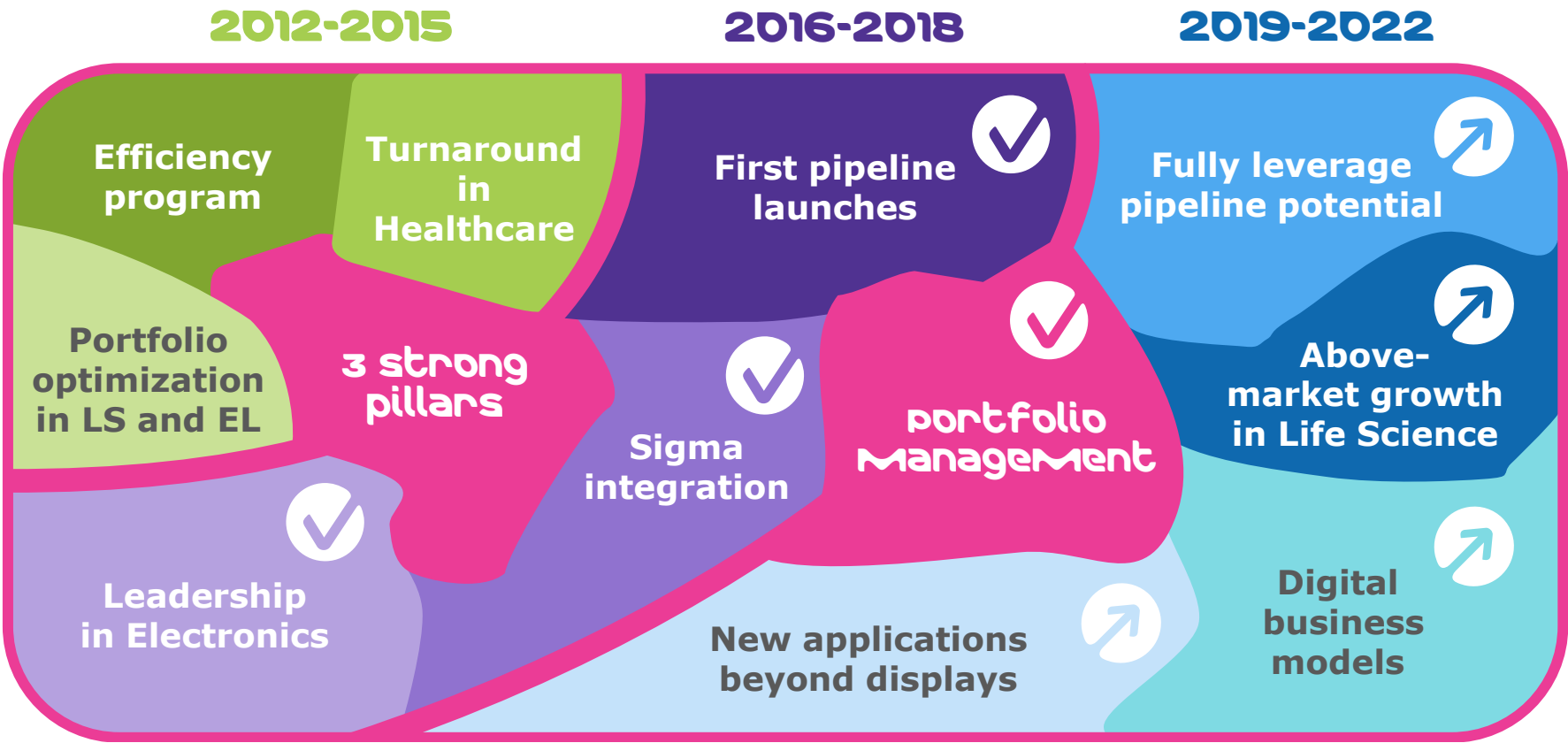
**Leading electronics player** poised for accelerating growth

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

<sup>1</sup>EBITDA pre share excluding Corporate & Others; 2020 EBITDA pre restated for €365 m patent litigation provision release      Acronyms: PS = Process Solutions, RS = Research Solutions, AS = Applied Solutions



# The 2016 vision – a strategic agenda until 2022



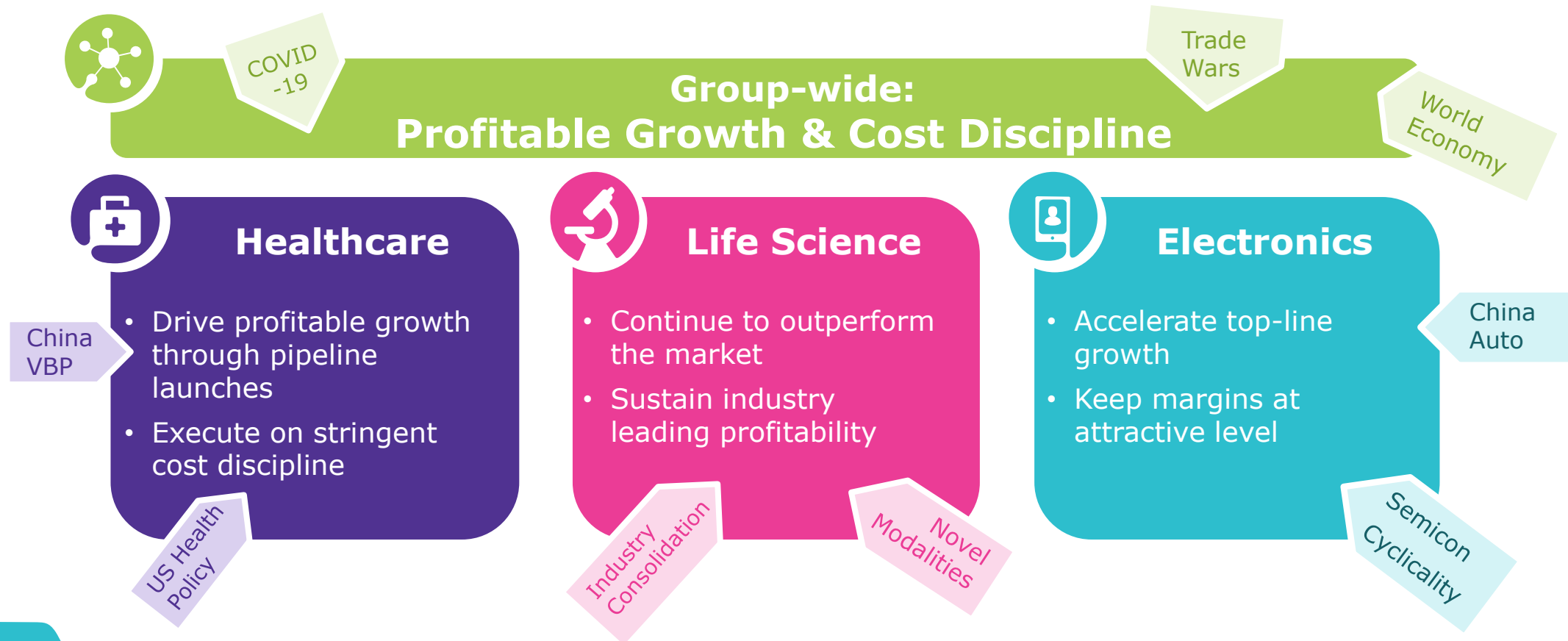
Executing on the growth and expansion phase of the 2016-22 strategic agenda

✓ = delivered; ↗ = well on track



Group

## 2021 and beyond – poised for growth in a challenging environment



**Staying on course in a potentially volatile environment**

Acronym: VBP = volume based procurement



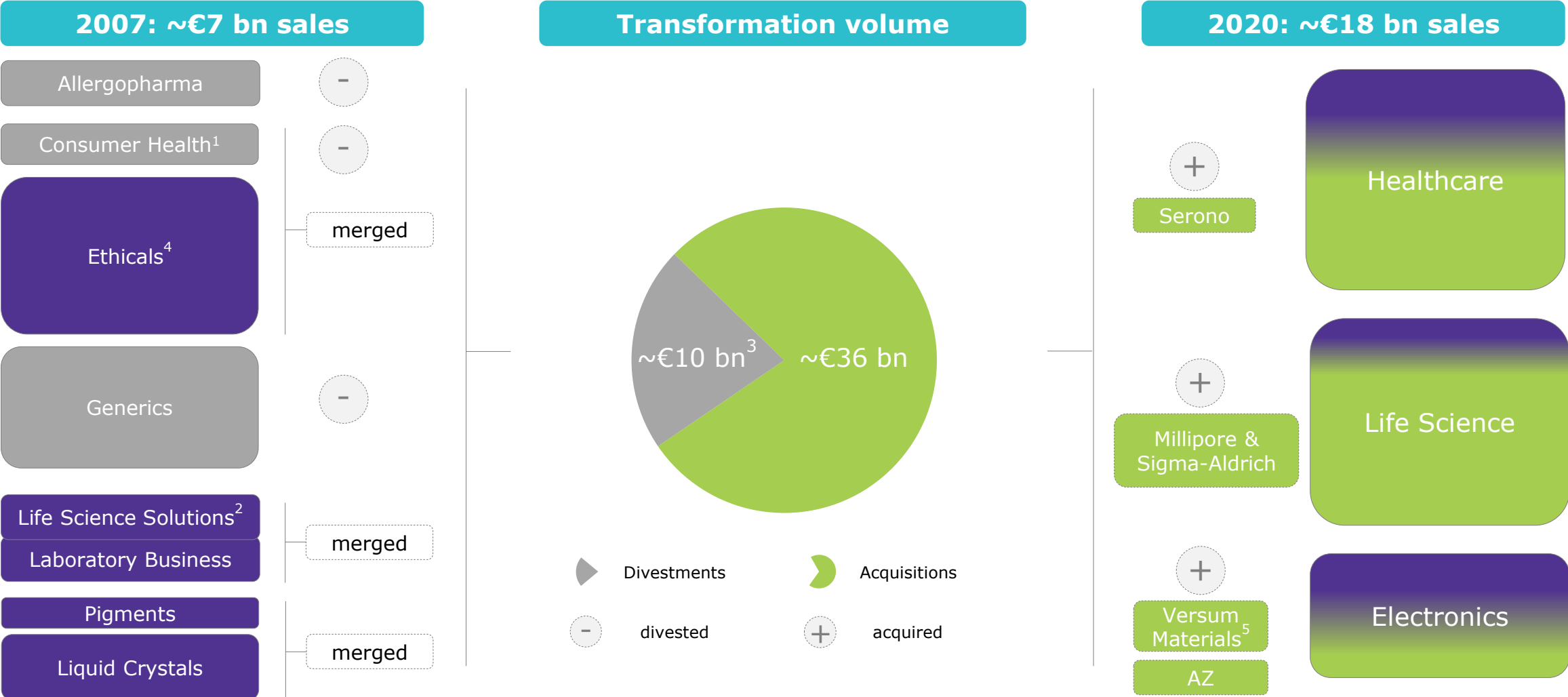


transforming  
the company

02

Group

We have added scale and strengthened the attractiveness of our portfolio



10

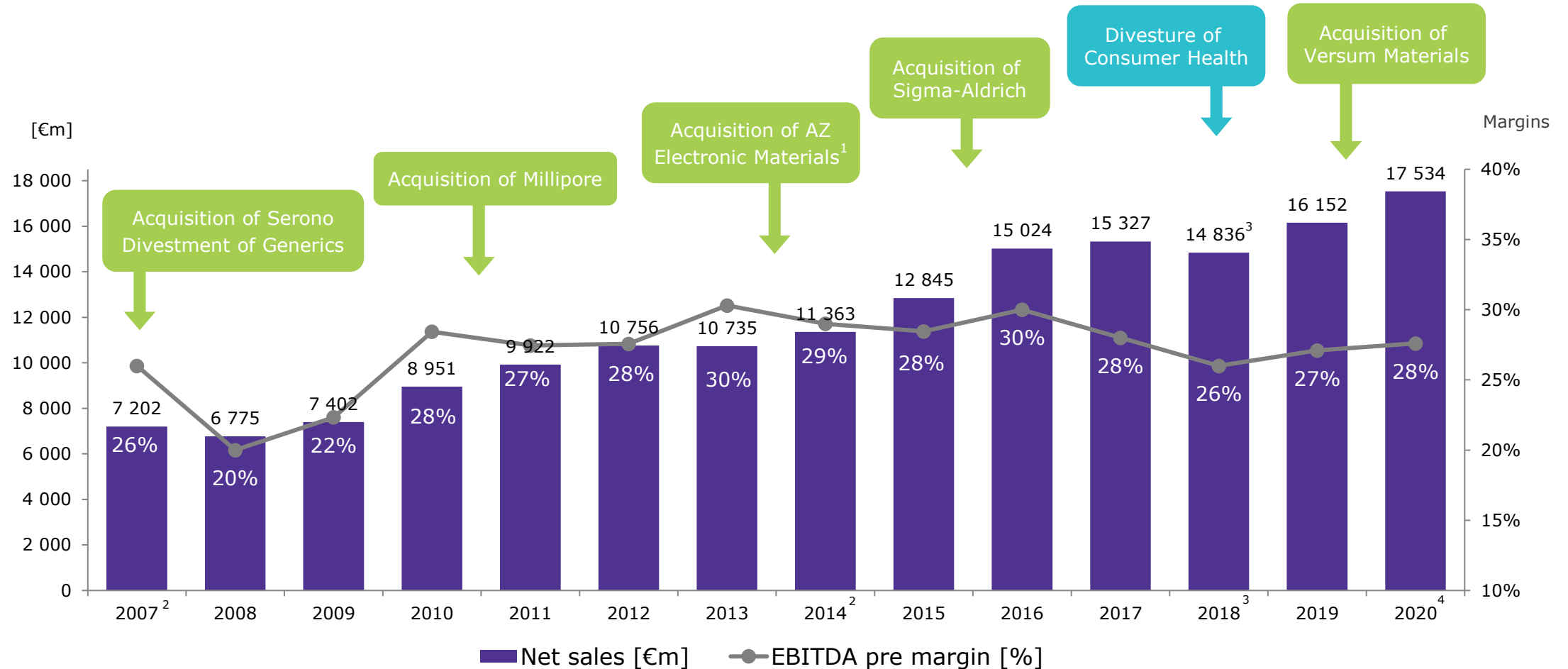
<sup>1</sup>Closing of sale of Consumer Health at a cash purchase price of €3.4 bn completed as of December 1, 2018; <sup>2</sup>Excluding "Crop Bioscience", which was divested;

<sup>3</sup>Profroma divestment volume includes cash proceeds for Consumer Health; <sup>4</sup>Excluding "Theramex", which was divested; <sup>5</sup>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

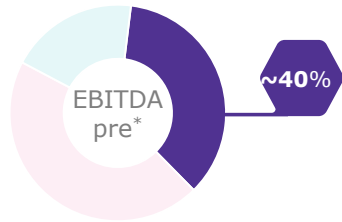


## Group

### Clear set of priority goals



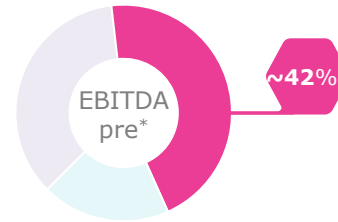
#### Healthcare



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



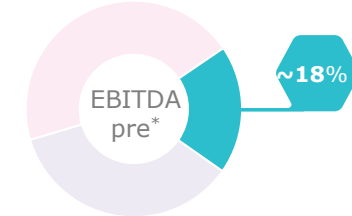
#### Life science



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



#### Electronics



- Deliver ambition of 3-4% CAGR
- Implement 5-year transformation program & focus on continuous seamless integration of Versum
- Maintain strong cash generation and cash conversion

\*based on FY 2020

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

### Global economy<sup>1</sup>



**Global  
GDP**

**~3% to 4%**



### End markets<sup>1</sup>



**Global pharma industry**  
**~4% to 5%**



**Global life science industry**  
**~5% to 6%**



**Global electronics industry**  
**~4%**



**~4% to 5%**

### Focus market areas<sup>1</sup>



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



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



**Semi materials: ~4% to 6%**



**6%-plus**

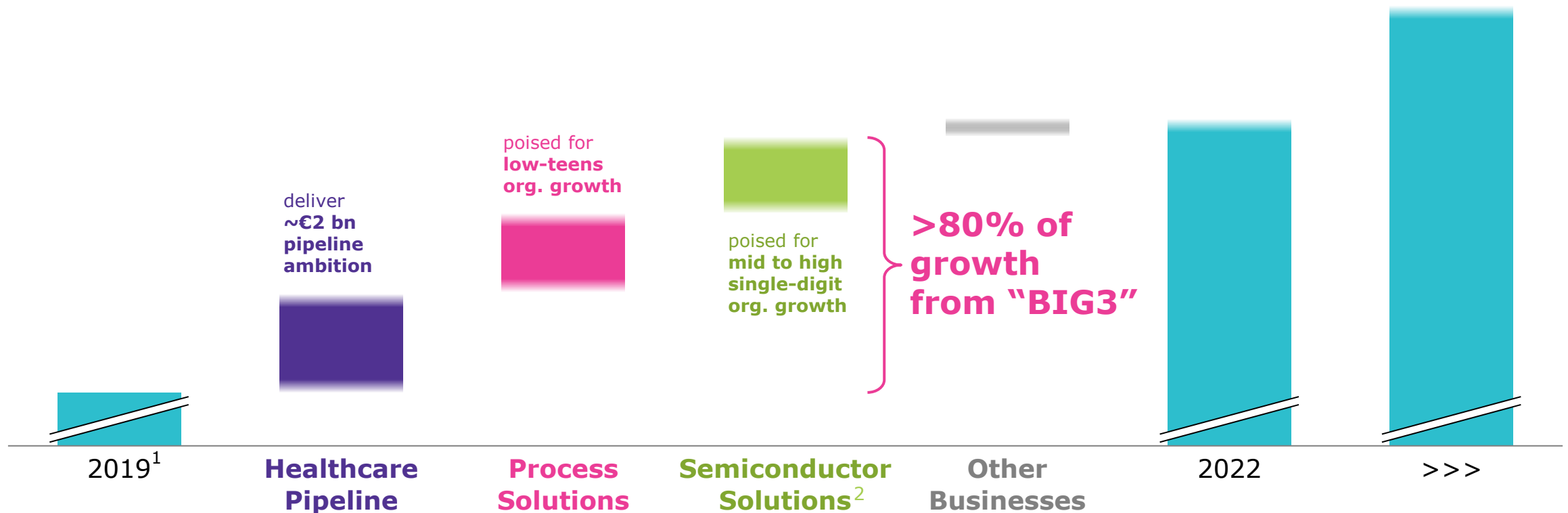


**Purposefully positioned in attractive markets with secular growth above global GDP  
...further focusing investments on attractive sub-segments**

<sup>1</sup> Company estimates of mid-to-long-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**

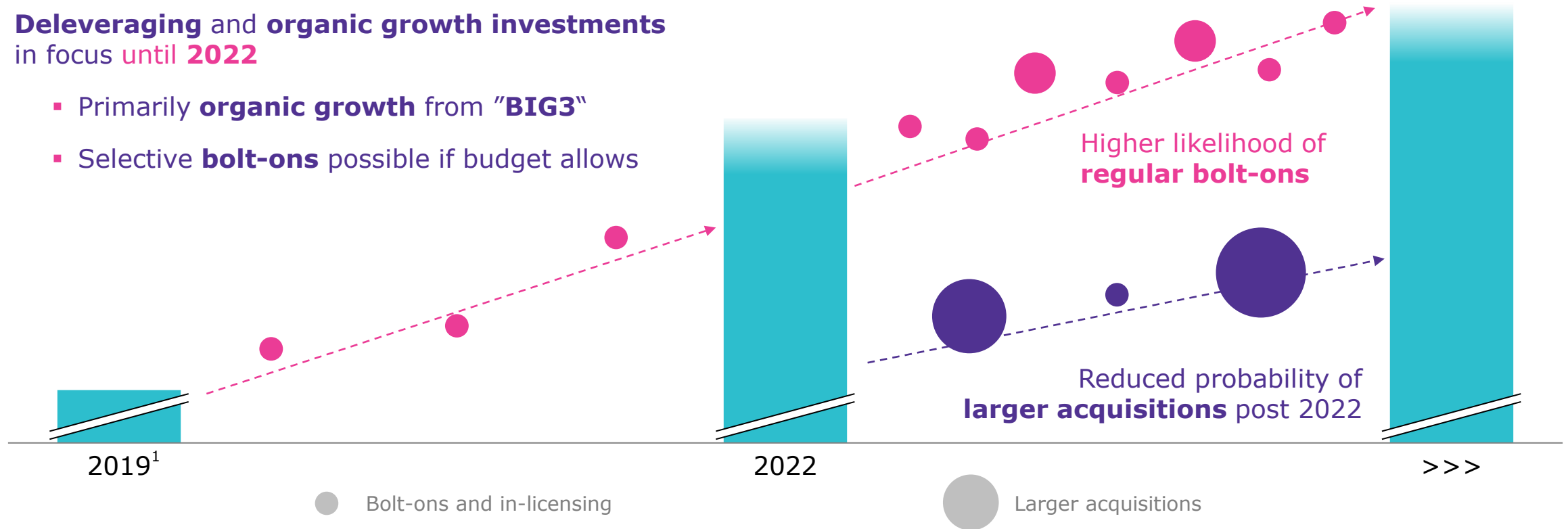
<sup>1</sup> 2019 Group sales of €16.2 bn; <sup>2</sup> Including Versum portfolio effect



## 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**

<sup>1</sup> 2019 Group sales of €16.2 bn

# Healthcare

Executing on the earnings phase

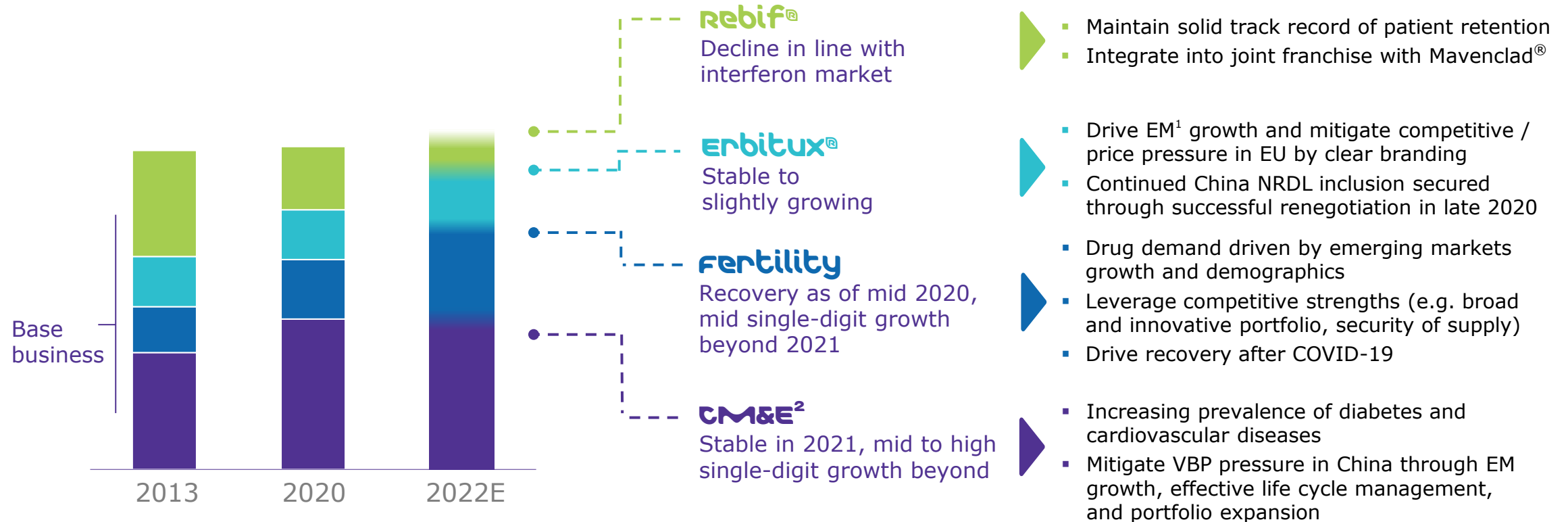
03



# Healthcare: Base Business

## Ambition to keep base business ~stable throughout 2021 and 2022

### Healthcare base business net sales until 2022



<sup>1</sup> EM: emerging markets; <sup>2</sup> Cardiovascular, Metabolism and Endocrinology (new Franchise name as of Q1 2021)



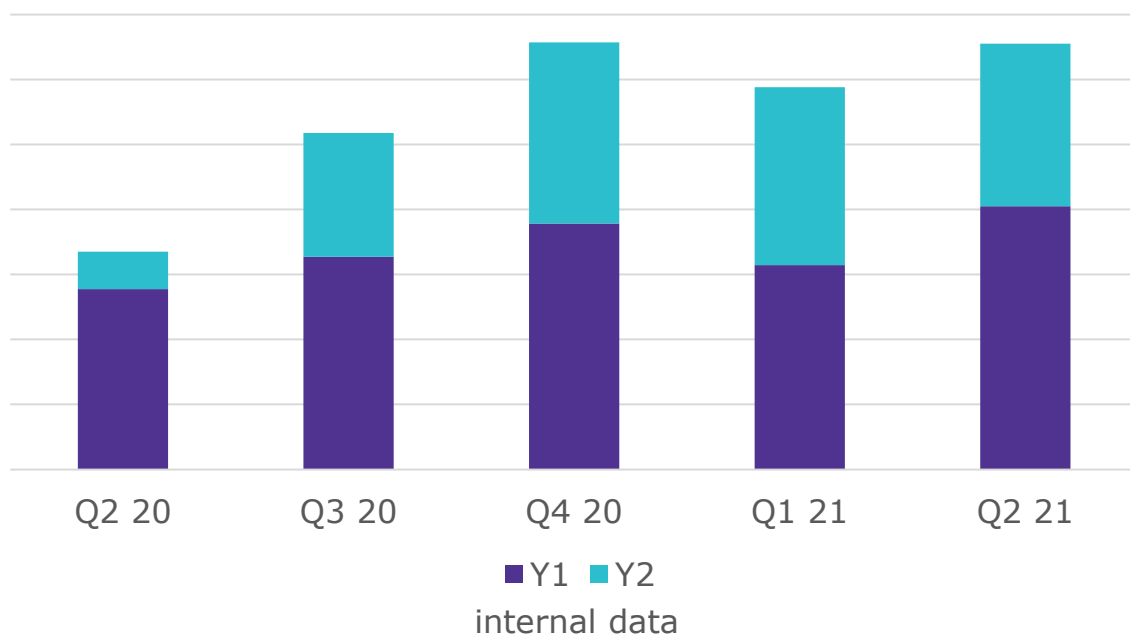
# Healthcare: Mavenclad® US

## Q2 Y1 patients growing QoQ with expanded prescriber base



**New patient volume growing 23% QoQ,  
now comprising over 60% of total  
patient volume**

Mavenclad® US Y1/Y2 patients



- ➔ **New patients growing** QoQ both in terms of volume and % of total patients
- ➔ **New prescribers growing** QoQ by 23%
- ➔ **Total patient growth in H2 2021** to be driven by:
  - Higher volume of H2 2020 return patients
  - Continued new patient growth



# Independent real-world data (RWD) differentiates Mavenclad®

- A high-efficacy DMT that demonstrates **full antibody response to COVID-19 vaccination**
- **Differentiated vs. other high-efficacy therapies** in light of COVID-19 vaccinations for MS patients

Patient population		Total N=125	Protective humoral immunity <sup>a</sup>
DMT treated patients	Mavenclad®	23	100% ( $p = 0.99$ ) <sup>b</sup>
	Ocrelizumab	44	22.7% ( $p < 0.0001$ ) <sup>b</sup>
	Fingolimod	26	3.8% ( $p < 0.0001$ ) <sup>b</sup>
Untreated MS patients		32	100%
Healthy subjects		47	97.9%



In the first-ever real-world data study of its type **all patients on Mavenclad® who received a mRNA COVID-19 vaccine were able to mount a full antibody response**, similar to healthy subjects and untreated people with MS, irrespective of lymphocyte counts<sup>1</sup>

DMT = disease-modifying therapy

1. Achiron et al. Ther Adv Neurol Disord <https://doi.org/10.1177/17562864211012835>

<sup>a</sup>Protective humoral immunity defined as a index value higher than 1.1 using EUROIMMUN semiquantitative ELISA for IgG specific for the recombinant S1 subunit of SARS-CoV-2 spike protein

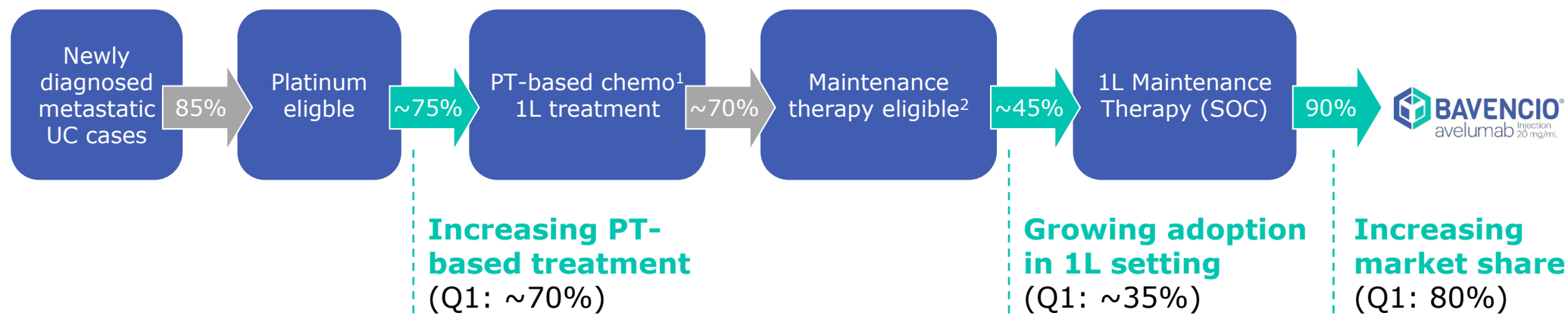
<sup>b</sup>Fisher's exact test to detect differences in categorical variables between DMT-treated patients with MS and untreated patients with MS



# Bavencio® UC 1L launch: Increasing the adoption of 1L maintenance therapy in both U.S. and ex-U.S.



**U.S. – 1 year into launch, continued progress across the entire treatment flow:**



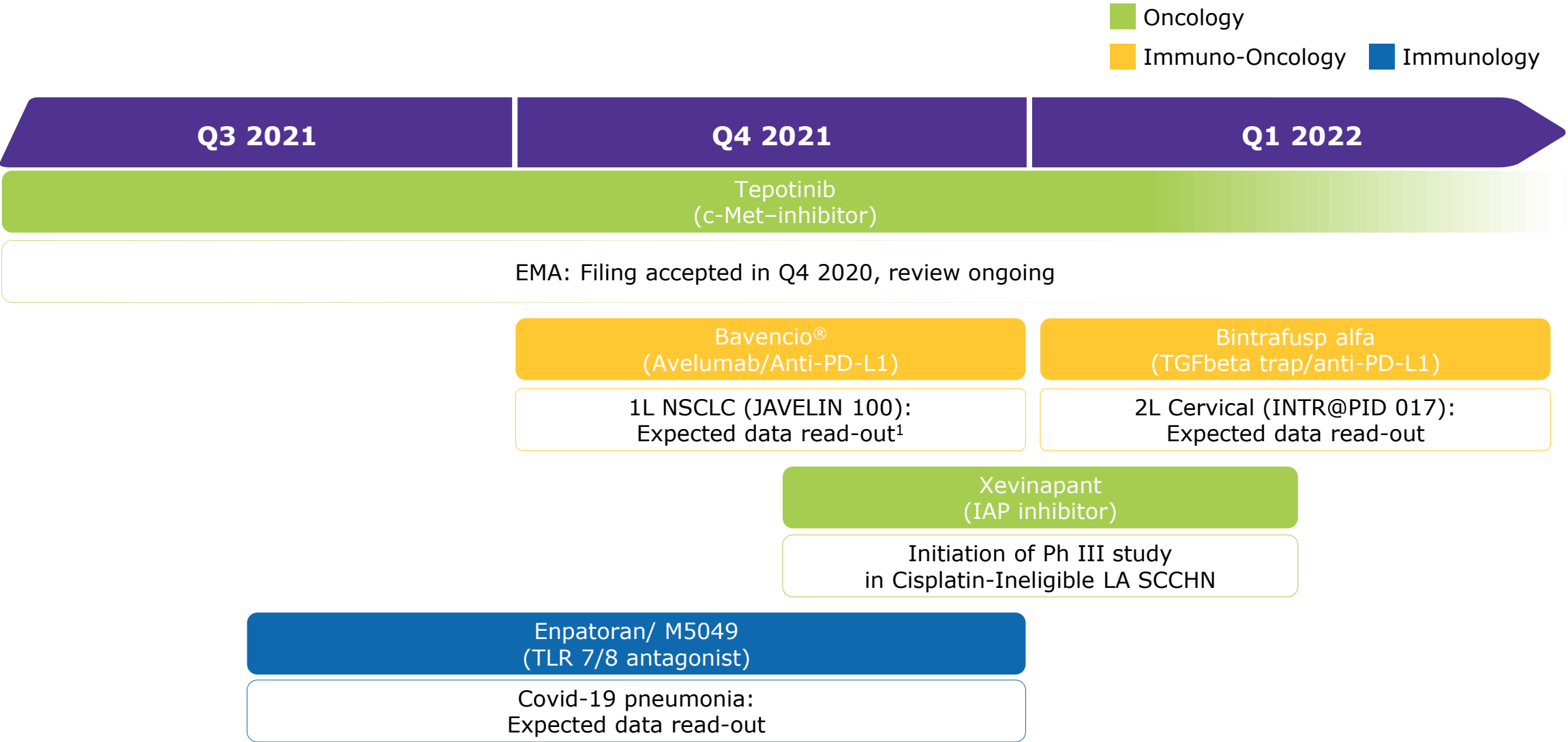
**Europe & Japan – Recently approved, encouraging uptake:**

- Now approved in **45 markets** and **reimbursed in ~1/3**
- Strong **initial uptake in key launch markets** (e.g. Japan, France, Germany) with guideline recommendations and KOL support, on track to become SOC

1: Carboplatin or Cisplatin, 2: Complete / partial response or stable disease based on clinical trial data; Acronyms: PT = Platinum, SOC = Standard of care



# Healthcare catalysts



Acronyms: EMA = European Medicines Agency, LA = locally advanced, SCCHN = Squamous cell carcinoma of the head and neck, NSCLC = Non-small cell lung cancer, TLR = Toll-like receptor,  
1: Clinical timelines are event-driven and may be subject to change



# Life science

Focusing on profitable growth

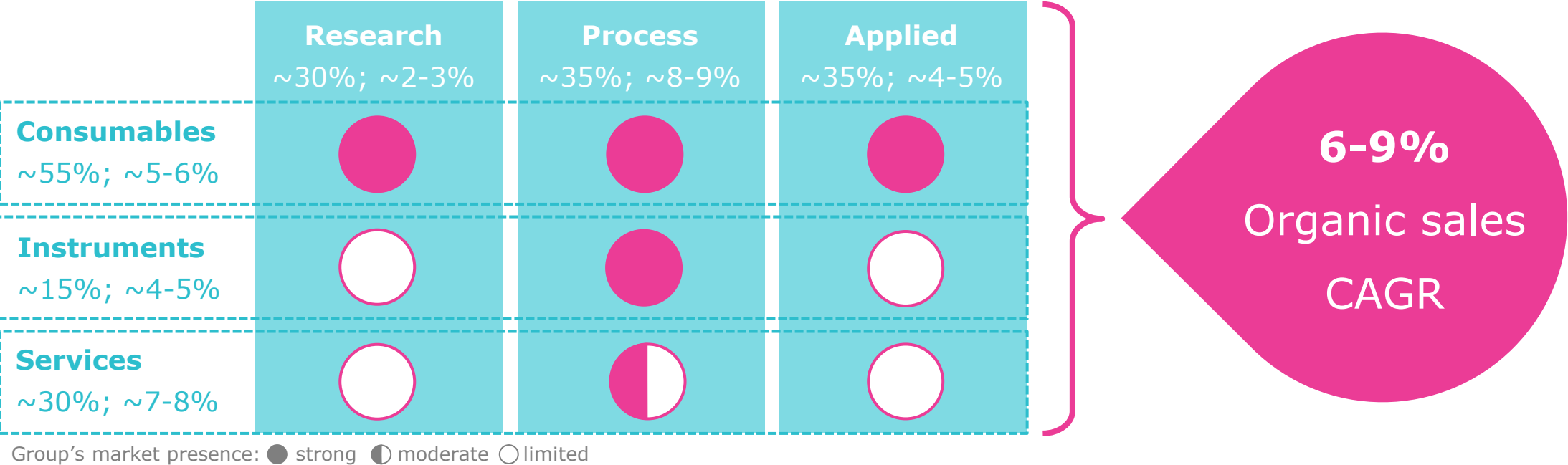
04

# Life Science

## Building growth momentum with focus on attractive market segments

**Total Life Science Market<sup>1</sup>**  
~€170-180 bn; ~5-6% CAGR

**Mid-term outlook**  
Life Science Business Sector

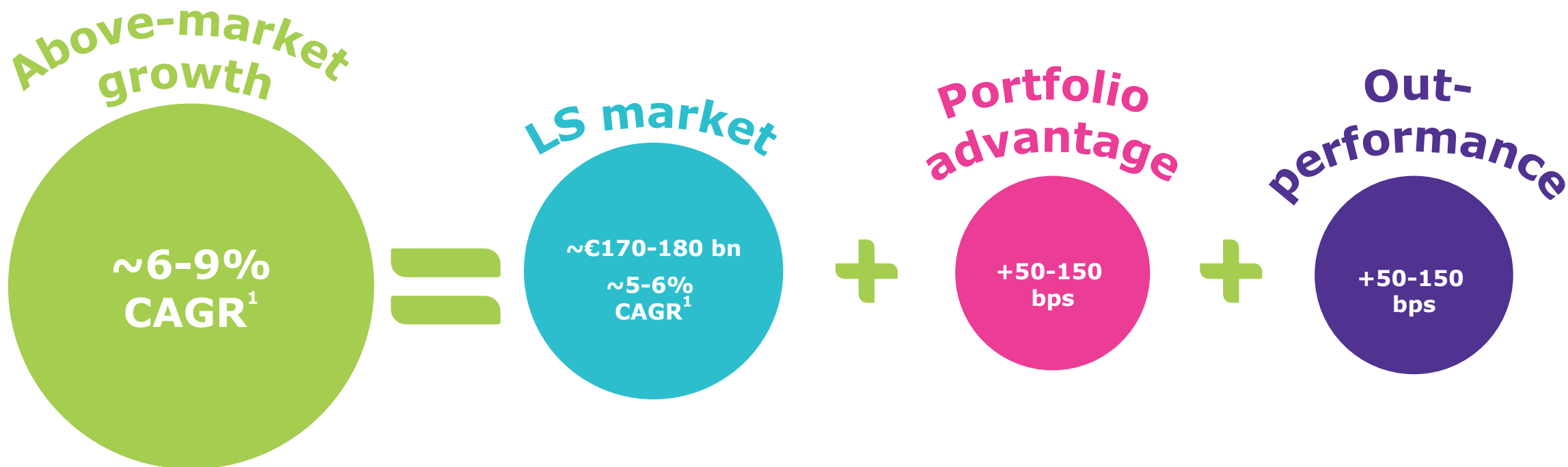


 **Upgrading** mid-term financial ambition to **6-9% organic sales CAGR**

<sup>1</sup> Company estimate of the market segments, based on industry forecast over 5-year horizon; all growth rates in 3x3 Matrix indicate external market growth



## Improved mid-term outlook driven by market and portfolio focus



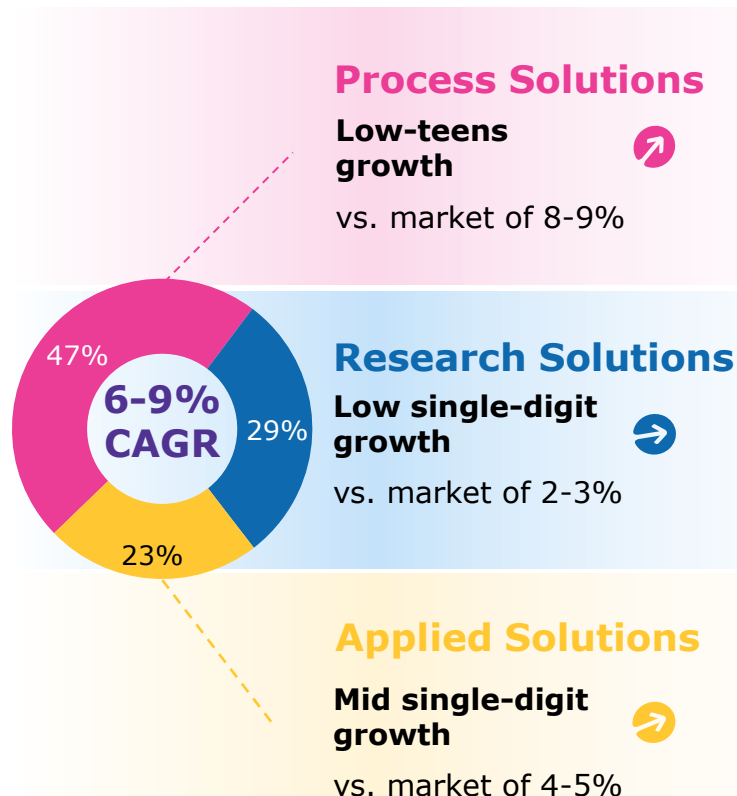
- **Market outlook improving** further, mainly due to **Process** segment
- **Above-market growth set to continue** due to **portfolio advantage** and **outperformance**

<sup>1</sup> Company estimate based on industry forecast over 5-year horizon; pre COVID-19 impact



## All business units contributing to above-market growth

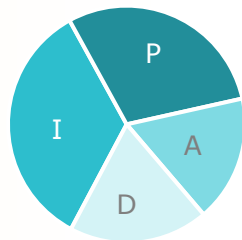
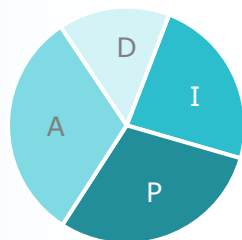
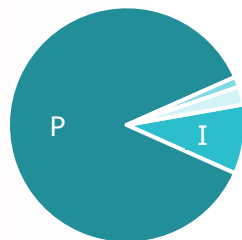
### Sales split<sup>1</sup>



### Mid-term outlook<sup>2</sup>

### Customer Split<sup>3</sup>

### Fundamental growth drivers



- **Biologics:** global mAbs<sup>4</sup> production growing by ~11-15% p.a. for 2020-2024<sup>5</sup> driven by new molecules and biosimilars
- **Diversification:** contribution by top 10 molecules will decline to ~30% until 2024 from ~50% in 2020<sup>6</sup>
- **Novel modalities:** cell & gene therapy market with >30% CAGR 2020-2024<sup>5</sup>, complex delivery drives demand for services and viral vectors
- **Research activity:** >9,000 pre-clinical projects in research pipelines<sup>7</sup>; rising number of experiments backs healthy growth in biotechs/CROs<sup>8</sup>
- **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

<sup>1</sup> Based on H1 2020, CAGR is organic mid-term ambition; <sup>2</sup> growth rates are organic CAGRs pre COVID-19; <sup>3</sup> indicative only; <sup>4</sup> mAbs = monoclonal antibodies; <sup>5</sup> Source: company estimate based on industry forecasts; <sup>6</sup> Source: EvaluatePharma; <sup>7</sup> Source: statista; <sup>8</sup> CRO = Contract Research Organization

## Critical offering in the fight against COVID-19



**PRODUCTS feed into...**

[www.sigmaaldrich.com/covid-19](http://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

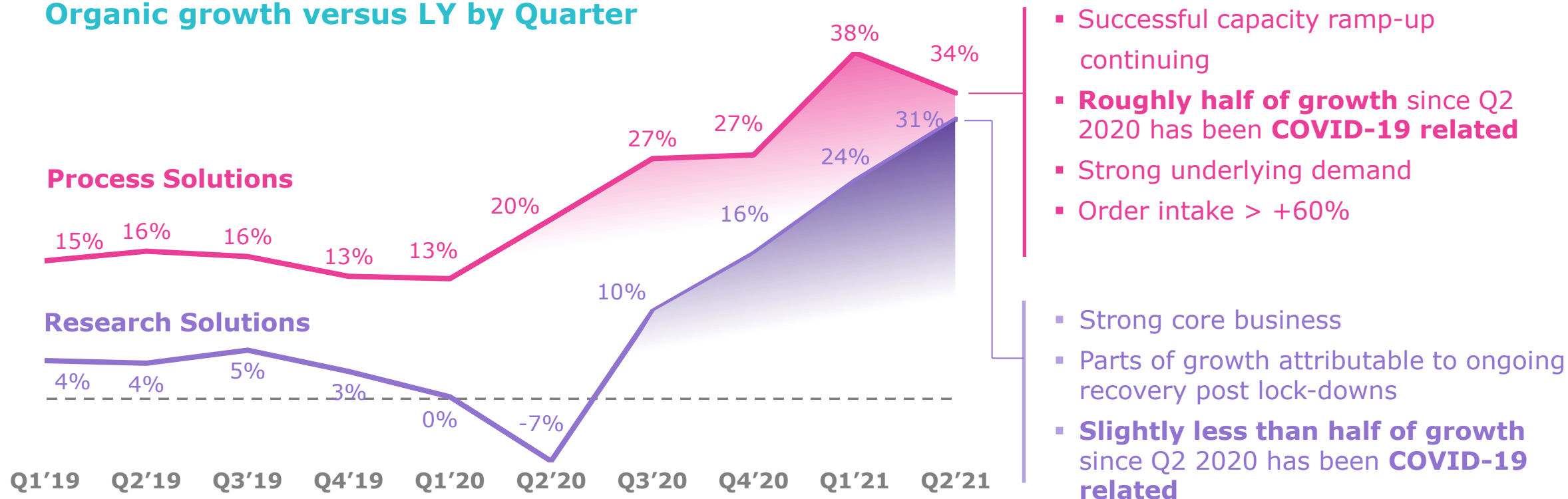
- Offering is among largest biologic reagents and hardware portfolios
- Effective vaccines and therapies start with reliable virus characterization
- Highest quality reagents needed for understanding of viral attachment, genomics, or proteomics

### 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**

# Life Science: Upside potential for Process Solutions materializing amid increasing capacity; Research Solutions gaining momentum as well

## Organic growth versus LY by Quarter



### Key factors for 2021 guidance remain:

- Further progress of capacity expansions & optimizations
- Sustainable demand growth; both Covid-19 and underlying



# electronics

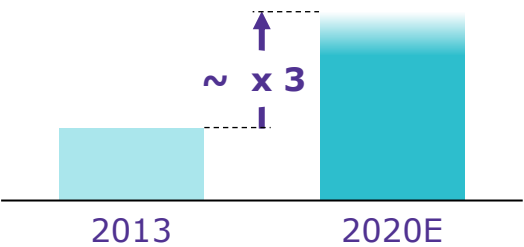
Leveraging the portfolio shift

05

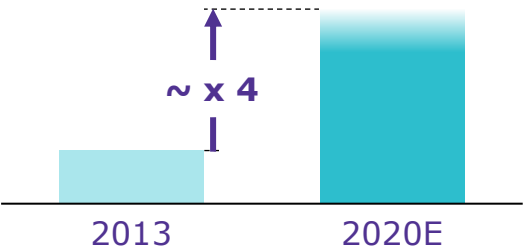
# Electronics

## Portfolio shift leads to greater resilience and accelerated growth

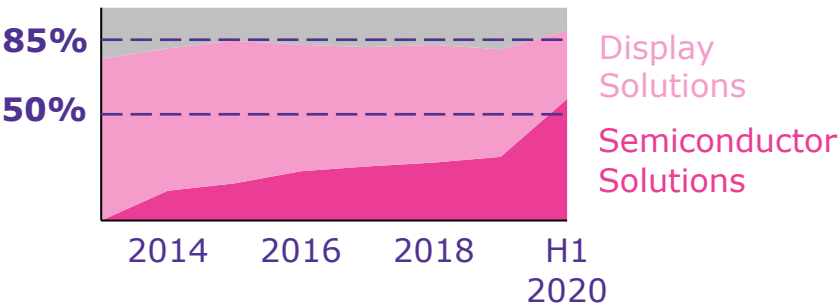
# of customers  
[that make up 80% of Sales]



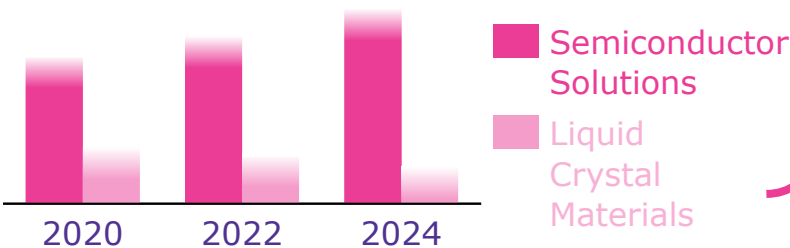
# of product groups  
[that make up 80% of Sales]



Electronics sales split  
[% of total]



Semi vs. Liquid Crystals  
[illustrative anticipated sales development]



Mid-term outlook  
Electronics



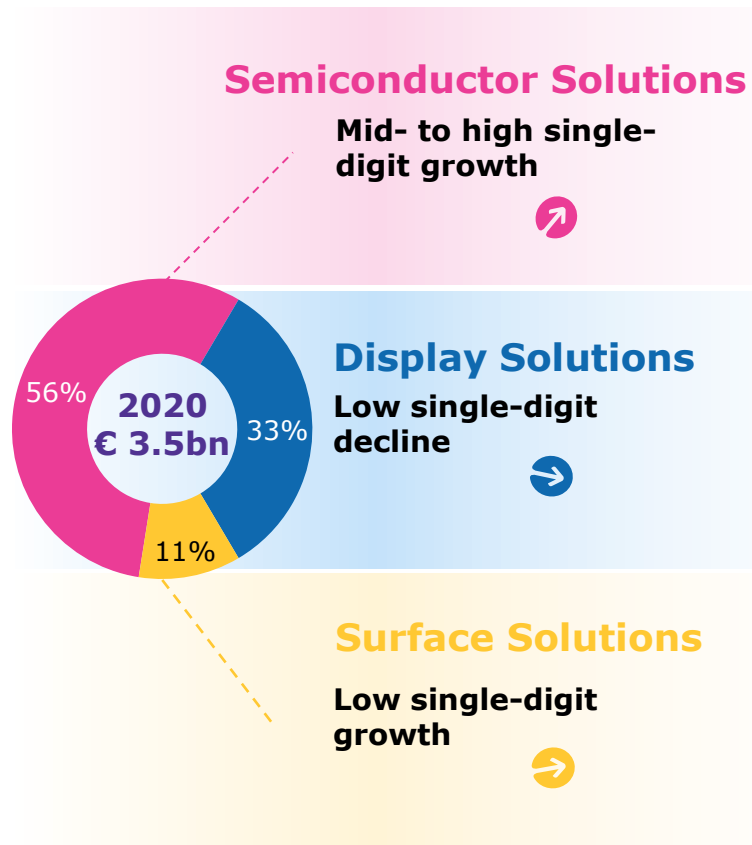
Updating mid-term financial ambition to **3-4% organic sales CAGR**



# Electronics

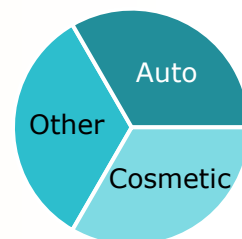
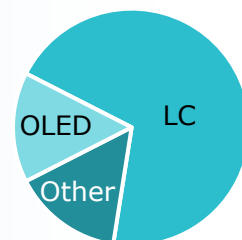
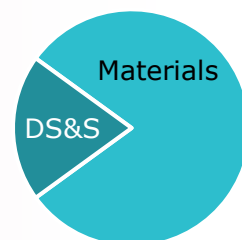
## Portfolio refocus drives mid-term guidance upgrade to 3 to 4% CAGR

### Sales split<sup>1</sup>



### Mid-term outlook<sup>2</sup>

### Business Split<sup>3</sup>



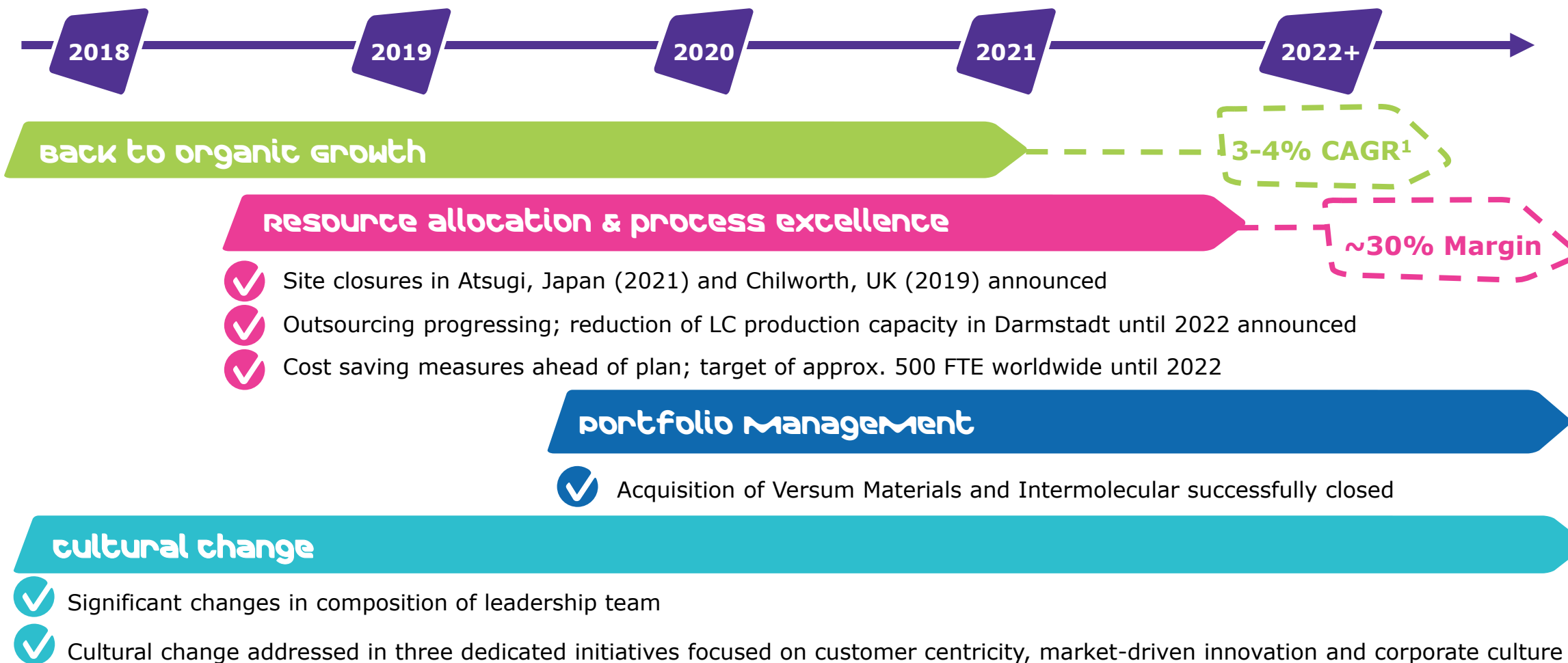
### Fundamental growth drivers

- 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<sup>4</sup>
- 200 to 300bps above-market growth from share gains & better portfolio (incl. 100 to 150bps additional growth from integration top-line synergies)
- Driven by trend to **bigger TV size, higher resolutions, more mobile devices**
- 3 to 4% growth of total LCD m<sup>2</sup> area<sup>5</sup>, while price pressure continues
- 18 to 22% growth of total OLED m<sup>2</sup> area<sup>5</sup> with slight to moderate market share gains
- OLED material market to exceed LC material market by 2021<sup>6</sup>
- Well balanced exposure to **automotive** and **cosmetics** end market
- Drivers: rising living standards, higher disposable income in growing markets & higher 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<sup>7</sup>

<sup>1</sup> Based on FY 2020, CAGR is organic mid-term ambition; <sup>2</sup> growth rates are organic CAGRs; <sup>3</sup> indicative only

<sup>4</sup> Source: Jan 2020 IC Insights 2018-2024 CAGR for wafer starts in million units; <sup>5</sup> Source: Omdia Display Market Outlook, Q1 2020; <sup>6</sup> Internal Business Intelligence; <sup>7</sup> Sources: LMC Automotive Light Vehicles Forecast, Aug 2020 & Euromonitor BPC (Beauty & Personal Care) Aug 2020

## 5-year transformation program Bright Future is well on track



<sup>1</sup>New mid-term CAGR guidance starting 2020

# Electronics

## 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



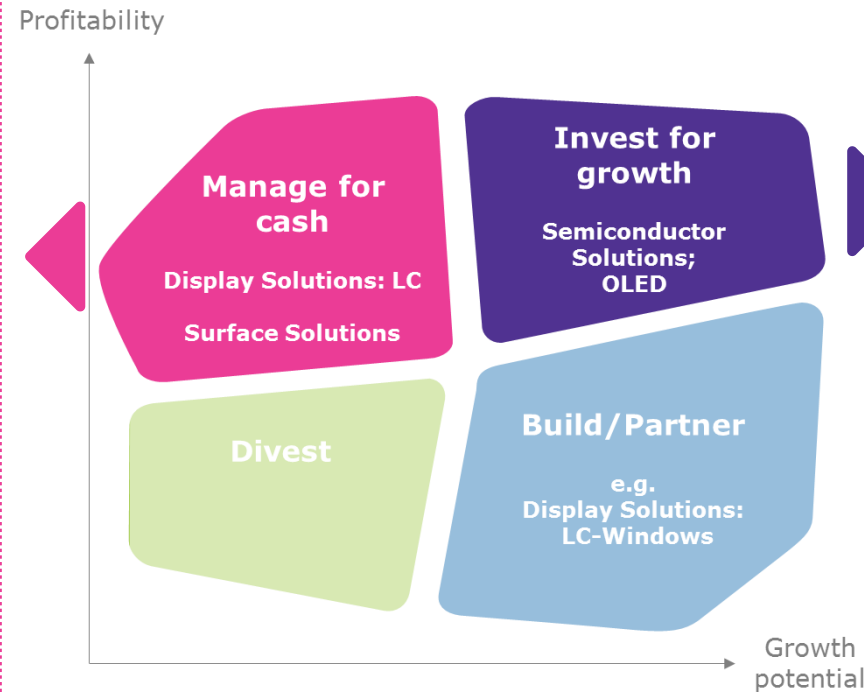
#### Chilworth

- Chilworth site during September 2019 successfully closed



#### Atsugi

- Shut down of Electronics 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



- 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



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



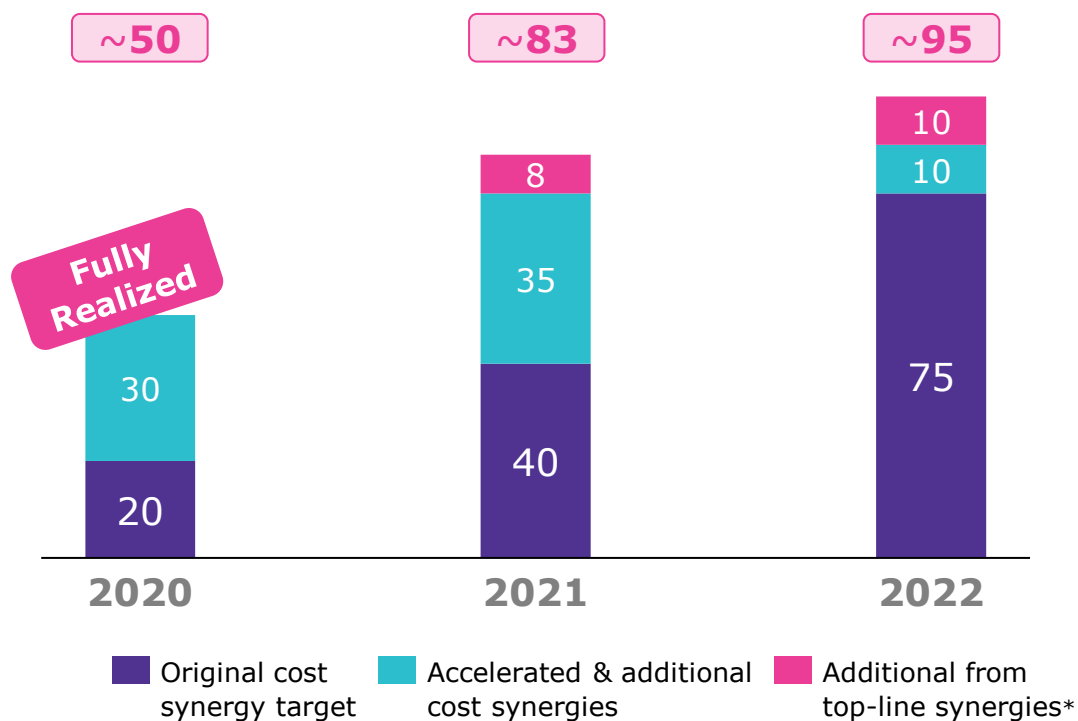
**Both transactions successfully closed**





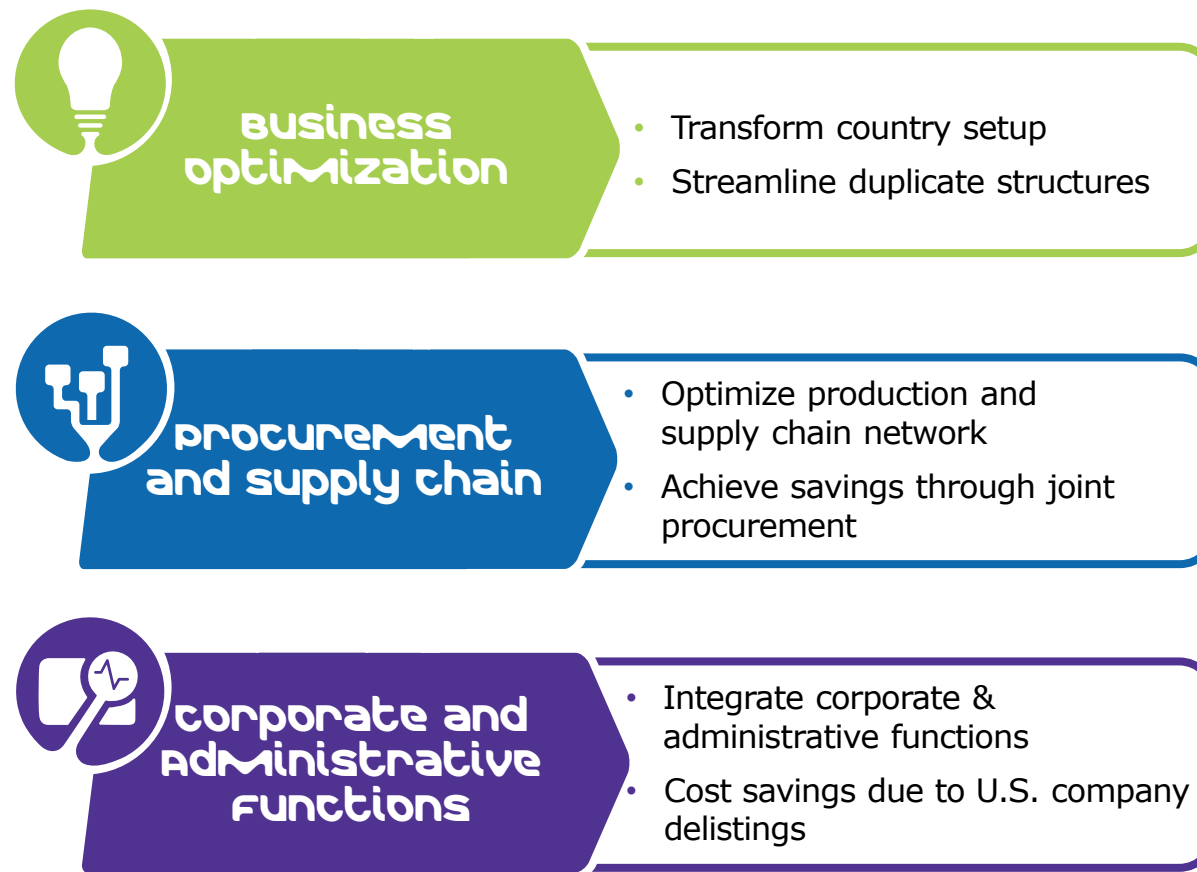
## Successful integration drives substantial synergy upgrade and acceleration

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



**Original target for 2022 is now being addressed for 2021**

### Sources of synergies

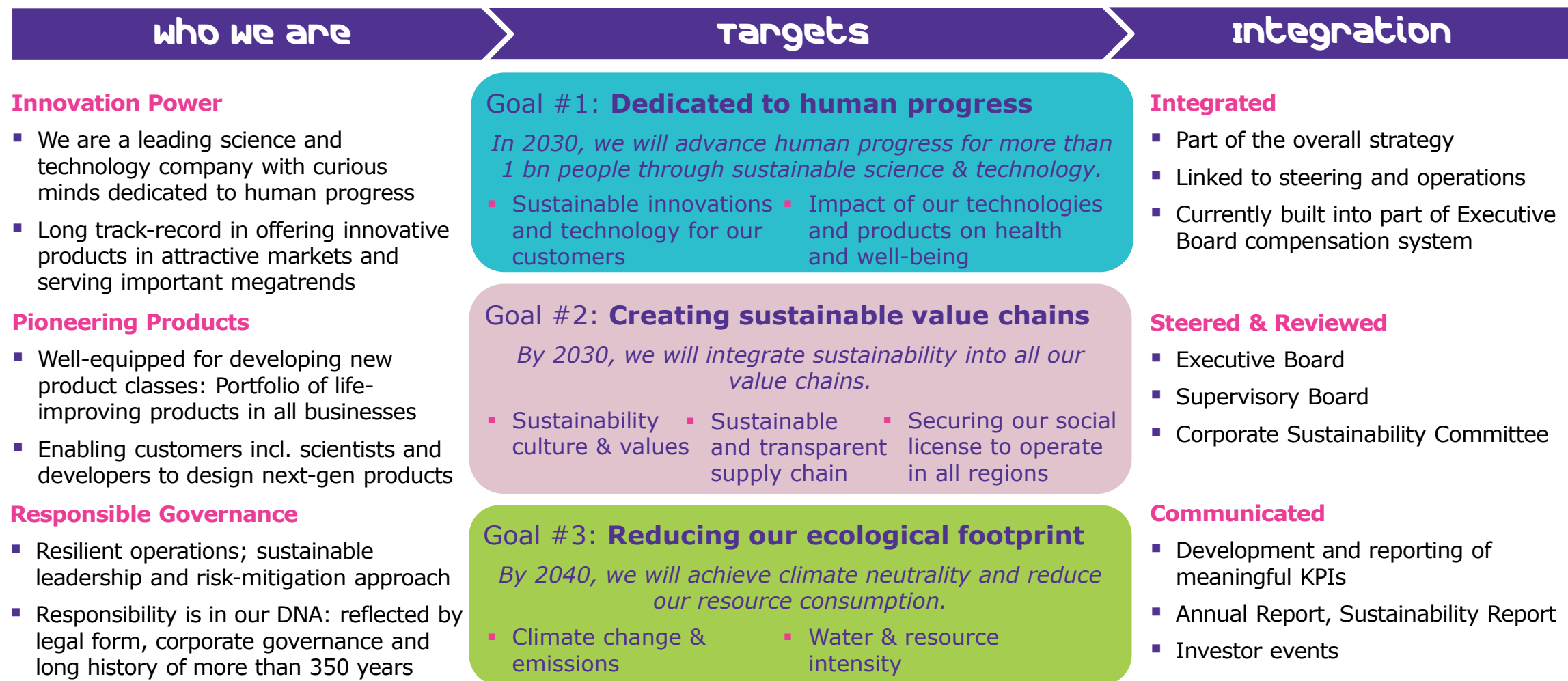


\*Top-line synergies from cross-selling, new products introductions and overarching initiatives


sustainability

06

# Sustainability strategy enhanced, leveraging strengths with clear commitment to new targets



# Potential to increase sustainable value for business and society

High-Impact SDGs		Where we can contribute	and benefit	
 <b>3</b> GOOD HEALTH AND WELL-BEING	Good Health and Well-being	➤ We are able to contribute with dedicated products, know-how, partnerships and initiatives in pharma, science and technology.	Goal <b>1</b> <b>3</b>	<b>Business opportunities</b> <ul style="list-style-type: none"> <li>Develop a new range of sustainable products &amp; services, benefiting from our innovation power</li> <li>Open up additional customer groups and expand regional reach</li> </ul>
	Decent Work and Economic Growth	➤ Our ambition of future growth considers health and safety of employees also in the supply chain.	<b>1</b> <b>2</b>	<b>Risk management</b> <ul style="list-style-type: none"> <li>Reduce risks through higher awareness and longer-term view</li> <li>Secure supply chain resilience</li> </ul>
	Industry, Innovation and Infrastructure	➤ Our innovation power will lead to more sustainable products and processes in various industries.	<b>1</b> <b>2</b>	<b>Partnerships</b> <ul style="list-style-type: none"> <li>Contribute as supplier of choice to customers' ESG strategy</li> <li>Improve ESG impact of our suppliers</li> </ul>
	Responsible Consumption and Production	➤ Being a responsible supplier, we will also challenge suppliers to support in reaching company targets.	<b>2</b> <b>3</b>	<b>Operations</b> <ul style="list-style-type: none"> <li>Increase attractiveness as employer</li> </ul>
	Partnerships for the Goals	➤ To unleash even more power, we foster collaborations with capable partners to sum up know-how for more sustainable impact.	<b>1</b> <b>3</b>	<ul style="list-style-type: none"> <li>Reduce costs of capital</li> <li>Benefit from grants and reliefs (politics, insurance, etc.)</li> <li>Incentivize through integrated compensation schemes</li> </ul>

# Reduce our environmental footprint:

## Environmental targets 2020 have been achieved, new targets set

### Achievements 2020

Reduce scope 1+2 emissions



#### Emissions target 2020 achieved!

- ✓ 25% overall reduction for Scope 1 and 2 emissions in 2020 relative to 2006 (planned: 20%)

Reduce water in stressed areas



#### Water target 2020 achieved!

- ✓ Water use in stressed areas reduced by 27% in 2020 vs. 2014 (planned: 10%)
- ✓ By 2020, all production sites<sup>4</sup> successfully implemented sustainable water management system

Reduce Group Waste Score



#### Waste target ongoing & on track!

- ✓ Based on Group Waste Score, reduced environmental impact by 4.6% vs. 2016 (planned: 5% by 2025)



<sup>1</sup>versus 2006 baseline, excluding Versum Materials

<sup>2</sup>versus 2014 baseline

<sup>3</sup>versus 2016 baseline

<sup>4</sup>Sites > 70.000 m<sup>3</sup>/a

### New targets from 2021

- Aiming for **climate neutrality** (scope 1 to 3 emissions) **by 2040** 
- **Lower scope 1 and 2 GHG<sup>5</sup> emissions by 50%** and to source 80% of purchased electricity from renewable sources until 2030 vs. 2020 baseline
- **Absolute reduction of 1,500 kt<sup>6</sup> scope 3 CO<sub>2</sub> equivalents by 2030**
- Enhancing water efficiency and **improve the new Group water intensity score by 10% by 2025** vs. 2019 baseline 
- Minimize negative environmental impacts, **harmful emission residues should be lowered** below a scientifically defined threshold by 2030

<sup>5</sup>GHG = Greenhouse Gas

<sup>6</sup>corresponds to ~30% of 2019 scope 3 emissions (current estimation incl. Versum Materials)

# Next steps towards achieving ESG targets

## AGENDA 2020-2022

Analysis of requirements: Strategy, business, regulation, stakeholders

Develop SBV tool<sup>2</sup> to measure product sustainability value

Link ESG<sup>1</sup> to board compensation

Build effective data platform for internal steering

Develop ESG KPIs for reporting

Further incorporate ESG in R&D, controlling, M&A and supply chain

Decide on dedicated investments and initiatives to achieve targets



## 2030 targets

**Dedicated to human progress**

goal 01

**Creating sustainable value chains**

goal 02

**Reducing our ecological footprint**

goal 03

<sup>1</sup>ESG: Environmental, Social, Governance

<sup>2</sup>Sustainable Business Value: Dive in deeper and read the research article on the [SBV method](#)

# Guidance and Executive Summary

07

# Full-year 2021 guidance

## Net sales:

Organic: +12% to +14% YoY

FX: -2% to -4% YoY

**~€18.8 – 19.7 bn**

## EBITDA pre:

Organic: +21% to +25% YoY (*excl. Biogen<sup>1</sup>*)

FX: -2% to -4% YoY

**~€5.6 – 6.0 bn**

## EPS pre:

**~ €7.80 – 8.50**

<sup>1</sup> Q3 20 reversal of the provisions for the patent litigation proceedings for Rebif in the amount of ~€365 m; Guidance including Biogen – organic EBITDA pre: +12% to +17%





# Group

## Looking beyond 2021

### Life Science

**Upgrading the COVID-19 PS floor for 2022 to €700 m**



- Higher 2021 overall **COVID-19 contribution of at least €1 bn**
- **Process Solution** expecting more than **€900 m COVID-19 related sales in 2021**
- Current strong additional demand and forward visibility warrant **upgrade**

### Healthcare

**Updating 2022 pipeline sales to €1.6 bn to €1.8 bn**



- Mavenclo® **peak sales** of €1 to 1.4 bn **unaffected**; phased outward due to COVID-19
- Ramp-up dependent on continued **recovery of dynamic market**
- Anticipated positive **impact of vaccines data**

### Electronics

**Further upgraded guidance also positive signal for 2022 and beyond**



- **Continued strong semi market** based on underlying **accelerating demand**
- Above mid-term guidance for 2021, **further upgraded** organic sales growth
- **Positive market signals** also anticipated to **carry on mid-term**

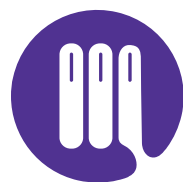
# Executive SUMMARY



## Group

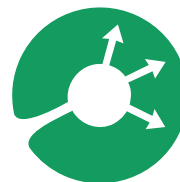
Successfully driving transformation into a leading science and technology company

steady earnings growth with high margins and a low risk profile



## 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



# Appendix

Group

# FX sensitivity per business sector



## Healthcare

### Sales

- Global presence
- ~35% of sales in Europe

### Costs

- High cost base in EUR from main manufacturing sites
- HQ costs and large part of R&D costs in EUR

### Net Sales currency exposure<sup>1</sup>



### FX impact on EBITDA pre<sup>2</sup>



## Life Science

### Sales

- Balanced regional sales split between EU, NA and RoW

### Costs

- Extensive manufacturing and research footprint in the U.S.
- Global customer proximity requires broad-based sales force

### Net Sales currency exposure<sup>1</sup>



### FX impact on EBITDA pre<sup>2</sup>



## Electronics

### Sales

- ~75% of sales in Asia-Pacific
- Industry is USD-driven

### Costs

- Main production sites in NA, APAC and Germany, several R&D and production facilities in Asia
- Improved natural hedge post Versum acquisition

### Net Sales currency exposure<sup>1</sup>



### FX impact on EBITDA pre<sup>2</sup>



# Acquisition history - Strengthening leadership positions

Year	Company	Volume	Sector
2021	Amptec	n/a	Life Science
2020	Resolutions Spectra Systems	n/a	Life Science
2019	FloDesign Sonics	n/a	Life Science
	Versum Materials Inc., USA	€5.8 bn	Electronics
2017	Intermolecular Inc., USA	€62 m	Life Science
	Grzybowski Scientific Inventions Ltd., USA	€7 m & €1 m	Life Science
	Natrix Separations Inc., Canada	€12 m & €7 m	Life Science
2015	BioControl	€161m	Life Science
	Sigma-Aldrich	€13.1 bn	Life Science
	Qlight Nanotech Ltd. (Israel)	n/a	Life Science
2014	Ormet Circuits Inc. (USA)	n/a	Electronics
	AZ Electronics	€1.9 bn	Electronics
2012	Peer+	n/a	Life Science
	Biochrom AG	n/a	Life Science
2011	CellASIC (USA)	n/a	Life Science
	Amnis (USA)	n/a	Life Science
2010	heipha Dr. Müller GmbH / Hycon branch of Biotest AG	n/a	Life Science
	Beijing Skywing Technology (China)	€14.5 m	Life Science
2009	Millipore Corporation (US)	€5.1 bn	Electronics
	Taizhu (China)	€26.3 m	Healthcare
2008	Bio-Fyt Pharma (Belgium)	€30.0 m	Life Science
	SeQuant	€6.9 m	Healthcare
2006	Serono (Switzerland)	€10.3 bn	Electronics
	Agribiotics Holdings (Canada)	€21.9 m	Healthcare
2005	Survac (Denmark)	€10.8 m	Electronics
	Avecia (UK) incl. Covion (Germany)	€49.3 m	Electronics



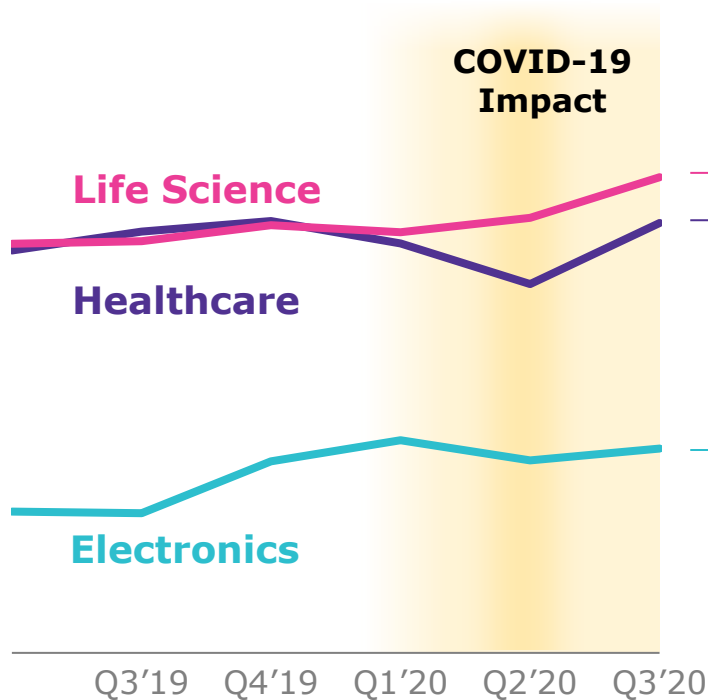
## Divestment history - Focusing on profitable core areas

Year	Company	Volume	Sector
2020	Litec-LLL GmbH Allergopharma	€3 m n/a	Electronics Healthcare
2018	Consumer Health	€3.4 bn	Healthcare
2018	Flow Cytometry business	€62.5 m	Life Science
2017	Biosimilars	€656 m	Healthcare
2016	Pakistan Healthcare business	n/a	Healthcare
2014	Discovery and Development Solutions	€22.6 m	Life Science
2012	Mobile Energy Business (Germany)	n/a	Electronics
2010	Crop BioScience Business (USA, CA and Argentina)	€208.2 m	Healthcare
	Théramex (Monaco and Italy)	€269.3 m	
2007	Generics	€4.9 bn	Healthcare
2006	ITO/CF Business (Taiwan)	€29 m	Electronics
2005	Electronic Chemicals Business	€270 m	Electronics
2004	Lab distribution VWR (US)	\$1.68 bn	Healthcare
	50% holding of Biomet	\$300 m	Electronics



# Successful crisis management increasingly mitigates pandemic impact

## Quarterly Net Sales in €m<sup>\*</sup>



## Underlying developments

- **Life Science well positioned** for new COVID-19 driven demand trends
- **Process business** rapidly addressing new market needs, **fueling net upside**
- Research and Applied **driving recovery in Q3**
- **Fertility: well managed return** to pre COVID-19 levels - not yet all regions
- **Strong Mavenclo® recovery** being driven since June
- **Bavenclo® UC launch** progressing very well on a largely virtual launch
- **General Medicine** on track with good volume development
- Managing visible **recovery in Q3**, but not yet growing organically
- **Semiconductors Solutions' strength** within strong market
- Net downside from COVID-19 in **Display and Surface**

\* At fixed 2019 FX rates

Guidance upgrade proof point of **excellent crisis management** and **strong business performance**



## Group

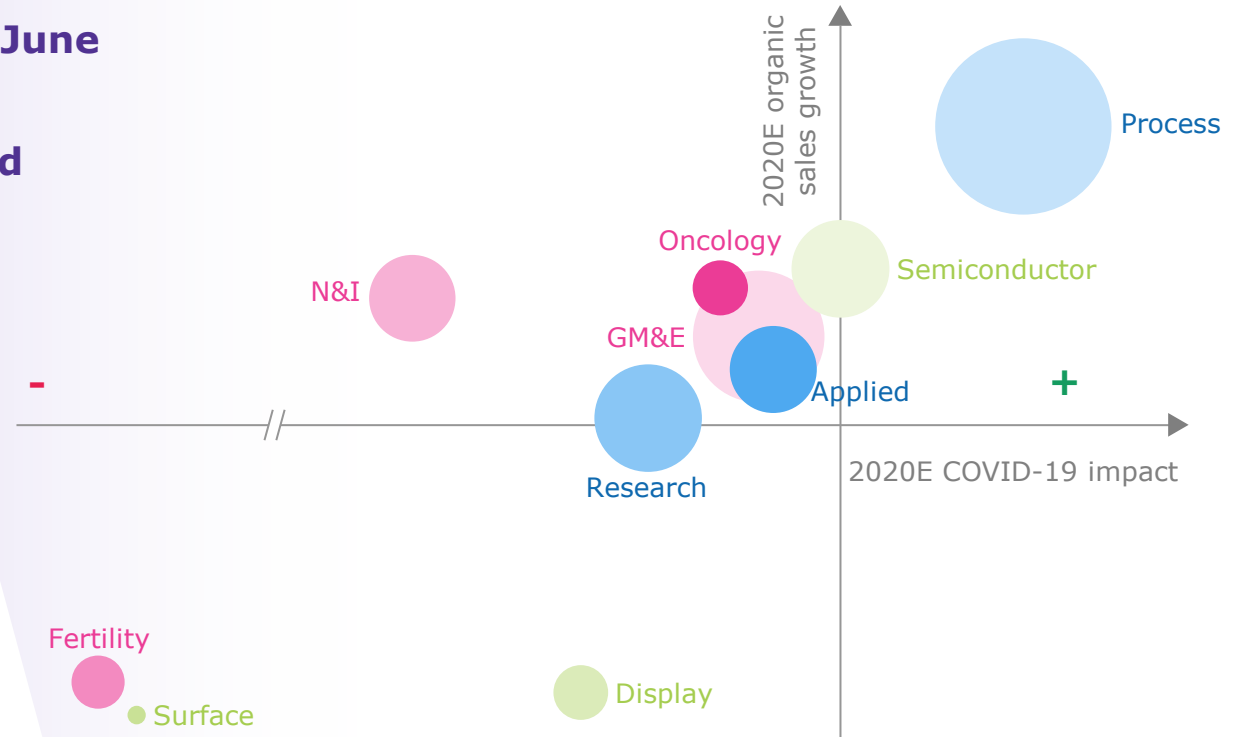
# 2020 – strong resilience in times of global crisis

- **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<sup>1</sup>



**CMD 2019**

**Group- steady earnings growth with high margins and a low risk profile**



<sup>1</sup> 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

# 2021 business sector guidance<sup>1</sup>

## Healthcare



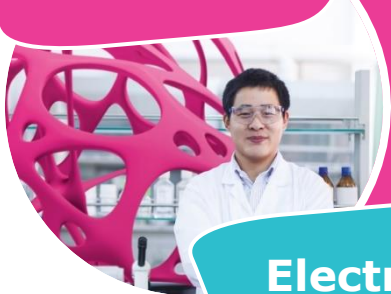
### Net sales

- Organic: +7% to +10%
- Mainly driven by Mavenclad<sup>®</sup>, Bavencio<sup>®</sup> and recovery of Fertility
- Base business organically around stable

### EBITDA pre

- Organic: +15% to +18% YoY (excl Biogen<sup>2</sup>)
- FX: -5% to -7% YoY
- ~€2,050 – 2,150 m

## Life Science



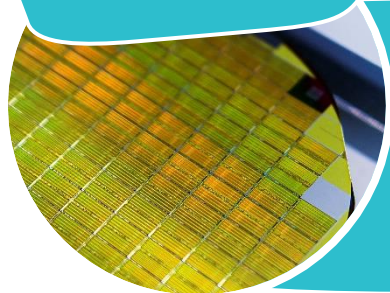
### Net sales

- Organic: +18% to +21%
- Process Solutions as main growth driver

### EBITDA pre

- Organic: +30% to +34% YoY
- FX: -1% to -3% YoY
- ~€3,050 – 3,200 m

## Electronics



### Net sales

- Organic: +6% to +8%
- Strong Semiconductor Solutions contribution
- OLED with high growth

### EBITDA pre

- Organic: +9% to +12% YoY
- FX: -2% to -4% YoY
- ~€1,070 – 1,130 m

# Additional financial guidance 2021

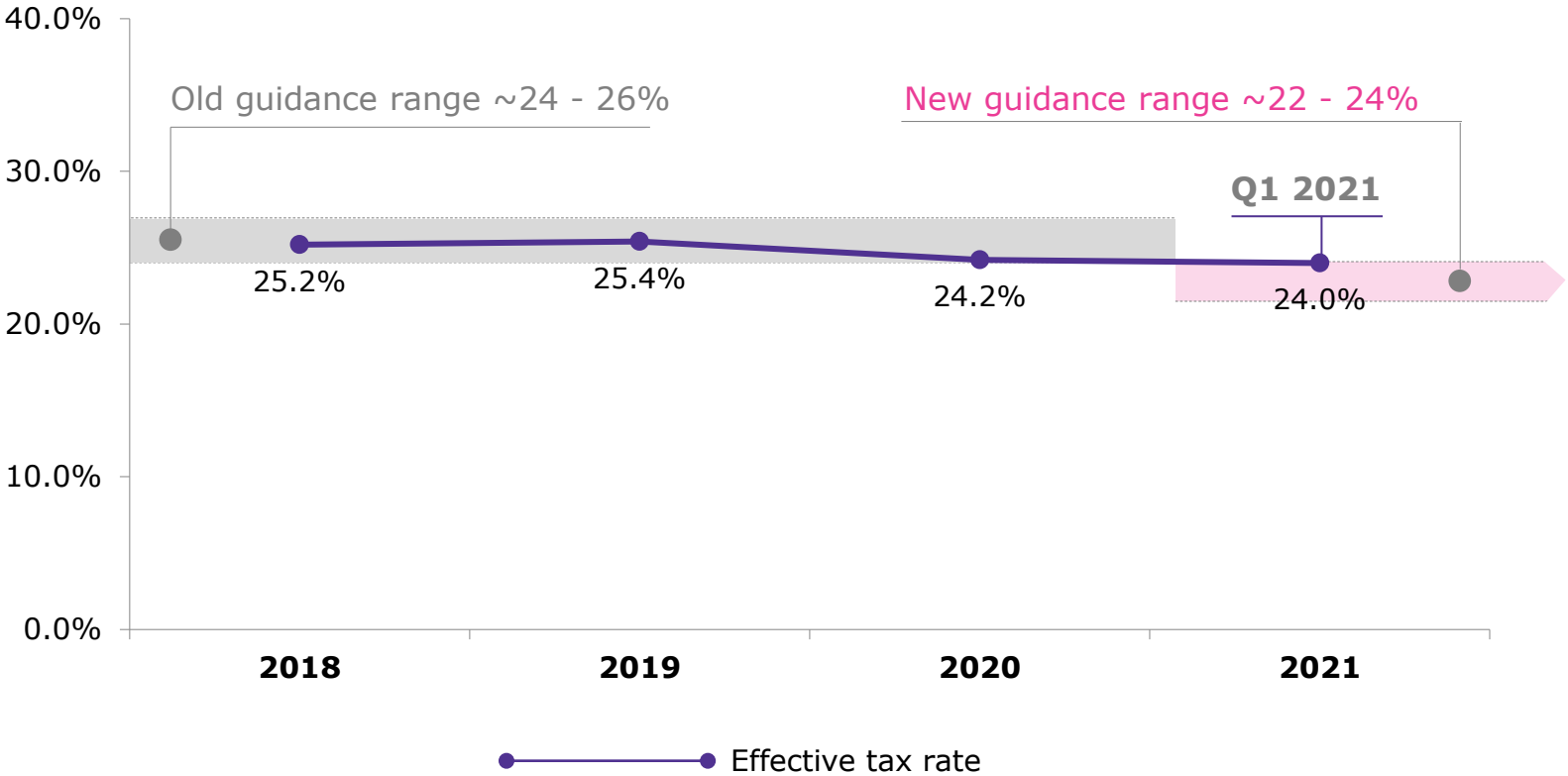
## Further financial details

Corporate & Other EBITDA pre	~ <b>€-450 to -500 m</b>
Interest result	~ <b>€-220 to -245 m</b>
Effective tax rate	~ <b>22% to 24%</b>
Capex on PPE	~ <b>€1.4 to 1.5 bn</b>
Hedging/USD assumption	<b>FY 2021 hedge ratio ~70% at EUR/USD ~1.17</b>
2021 Ø EUR/USD assumption	~ <b>1.19 to 1.23</b>



# Effective tax rate guidance lowered to new range of 22% to 24%

Tax rate development 2018-2020 and from 2021 onwards



## Rationale for update

Strong profit growth in Life Science results in different profit contributions worldwide, leading to a lower overall tax rate

New **resulting underlying tax** rate used for EPS pre calculation is now 23%



# Group

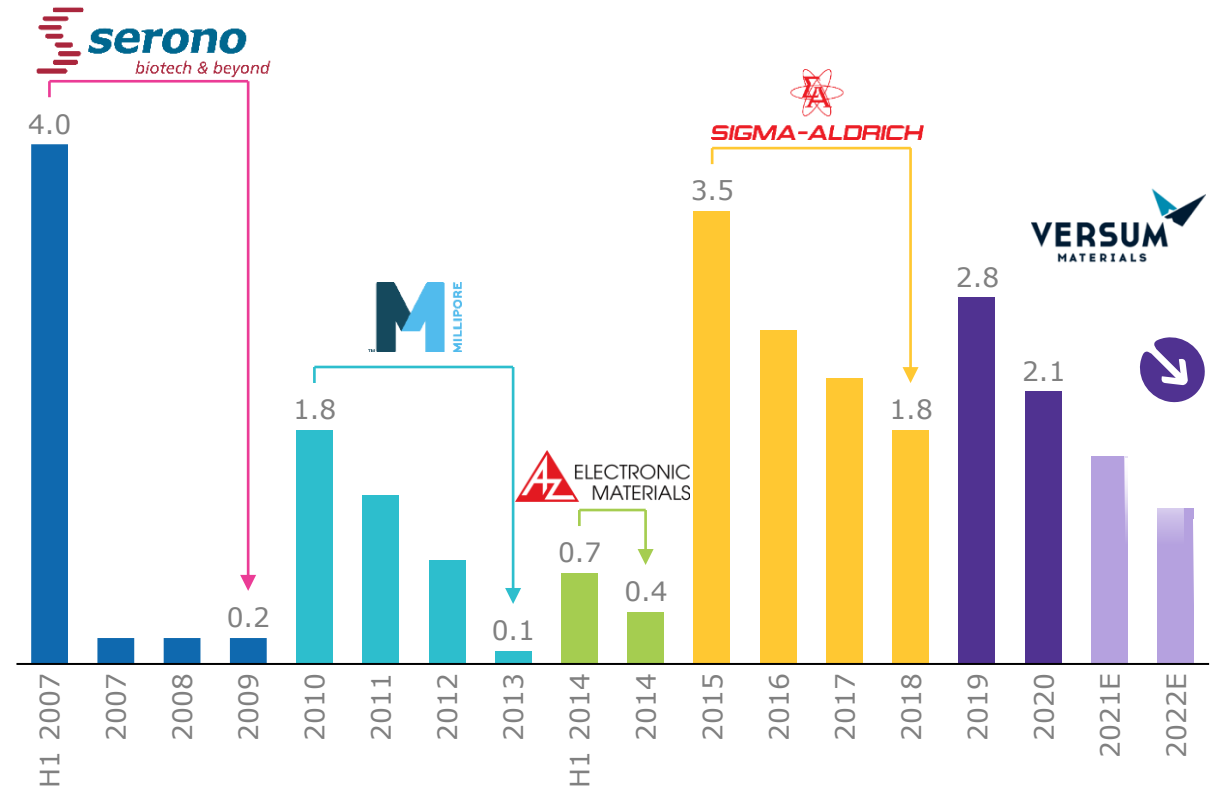
## Focus on organic growth and further deleveraging

### Proven swift deleveraging after major acquisitions

- **Deleveraged to ~2x** net debt/EBITDA pre already in 2020
- **M&A on hold until 2022**; only smaller deals to be realized if budget available
- New mid-term capex ceiling of ~€1.4 – 1.5 bn reflects **increased focus on organic investment**
- Dividend policy mirrors **sustainable earnings trend**

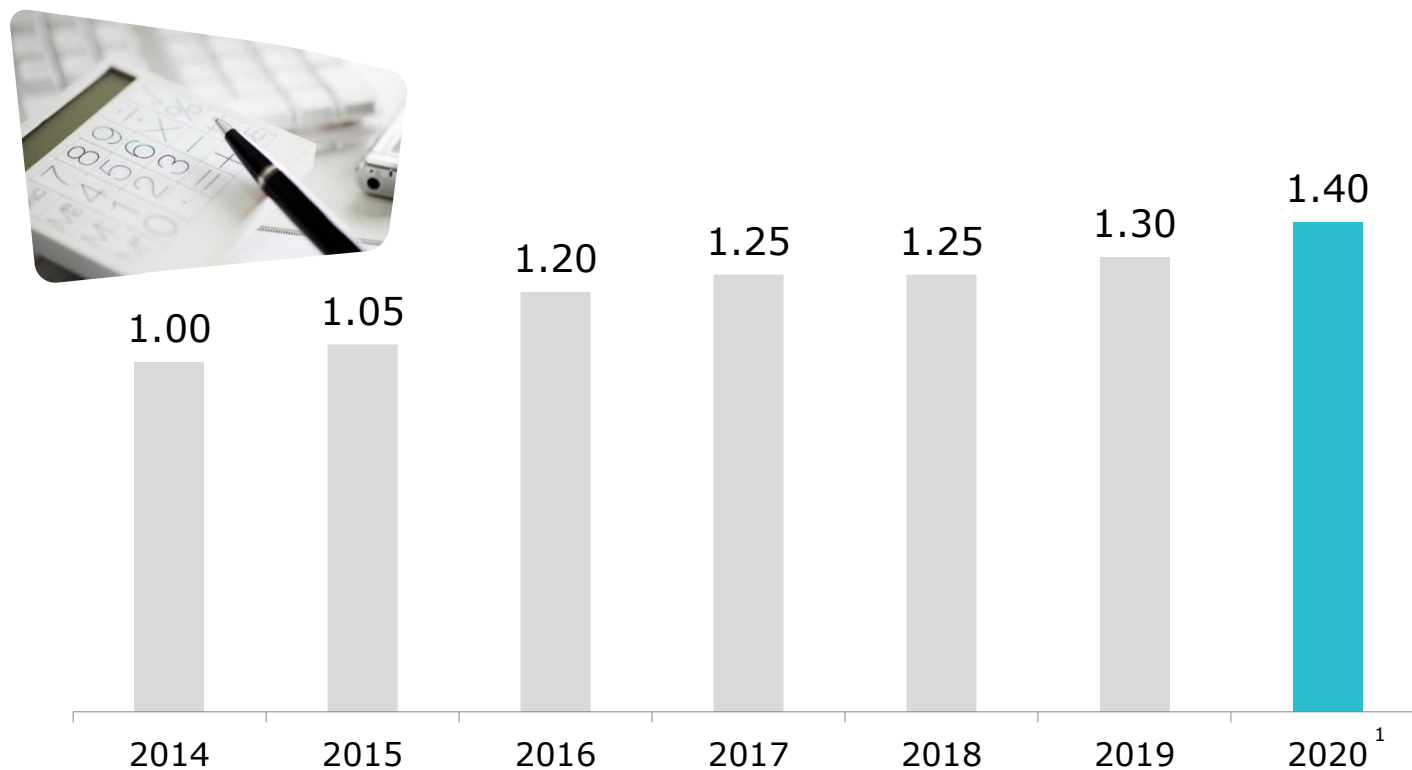
UPDATE

### Net debt / EBITDA pre track record & outlook



# Sustainable dividend growth

## Dividend development 2014 - 2020



## 2020 dividend

- Dividend of €1.40 (+8% YoY) per share approved<sup>1</sup> by Annual General Meeting
- Payout ratio of 23.1% of EPS pre<sup>2</sup> in 2020; aiming for 20-25% of EPS pre
- Dividend yield<sup>3</sup> of 1.0%

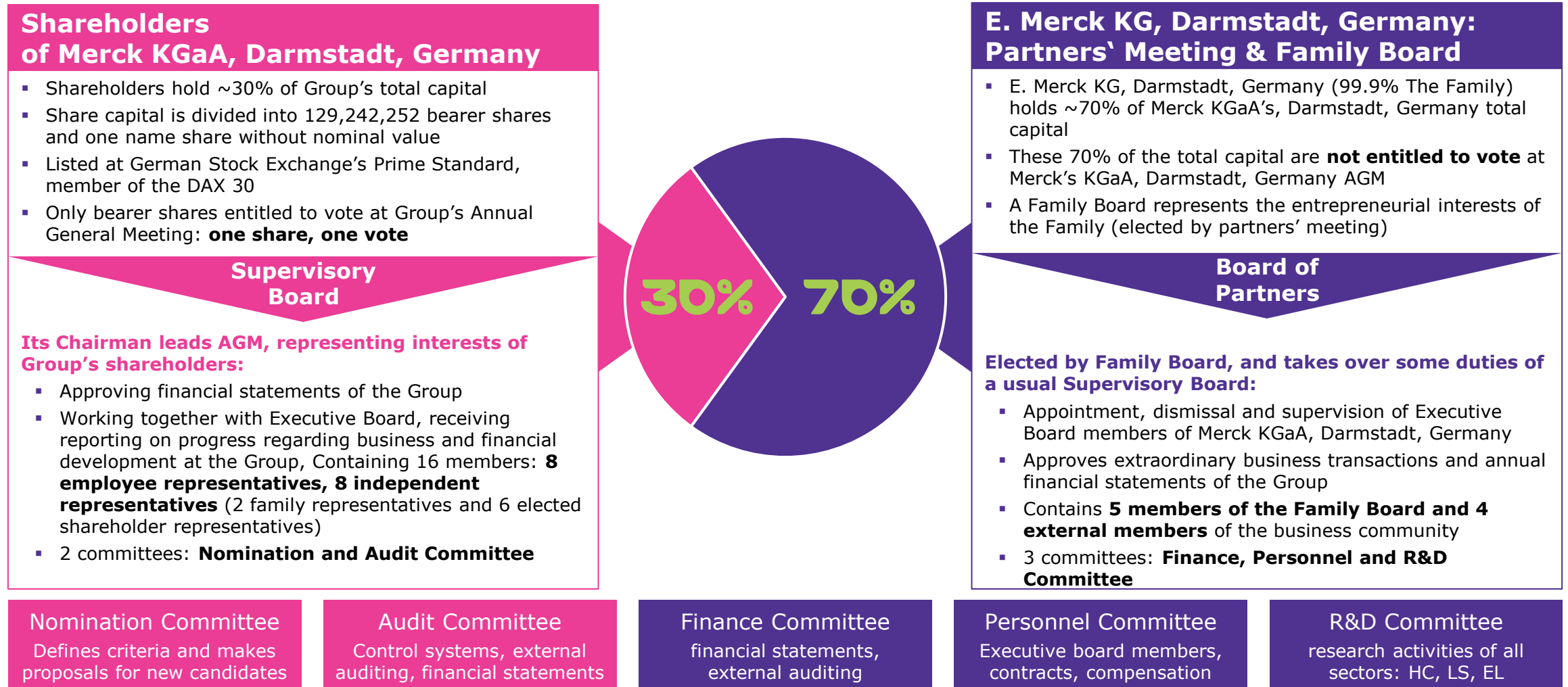
<sup>1</sup>April 28, 2021: Pay Date

<sup>2</sup>Excluding Biogen provision release, including the provision release the ratio is 20.9%

<sup>3</sup>Calculated with 2020 year-end share price of € 140.35 per share.

# Governance

## Merck's KGaA, Darmstadt, Germany ownership structure



# Executive board compensation

## Pay for performance reflecting the company's long-term strategy

Variable	40-50%	<b>Long-Term Incentive Plan</b> <ul style="list-style-type: none"> <li>Reflecting the long-term strategy for Company's <b>growth and (from 2022) sustainability ambition</b></li> <li><b>4 years performance cycle</b>: 3 years target achievement + 1 year holding period</li> <li>Based on virtual Group Share Units (Grant € divided through start share price, multiplied with the end share price)</li> <li><b>Financial targets</b>: 50% Group Share Price vs. DAX + 25% EBITDA pre margin + 25% Organic sales growth</li> <li><b>From 2022</b> multiplied with <b>sustainability factor (0.8-1.2)</b> reflecting KPIs from each of the sustainability goals</li> <li>Corridors for each target and achieved targets <b>published transparently</b> ex-post in the compensation report</li> <li><b>Maximum cap</b>: Maximum pay out 250%, maximum € cap for LTIP for each board member published</li> <li><b>Claw-back</b> allows to retain amounts allocated from the Long-Term Incentive Plan</li> </ul>	<div> <div>+</div> <div>Performance of Group share price vs. the DAX</div> <div>50%</div> </div> <div> <div>+</div> <div>EBITDA pre margin in relation to target value</div> <div>25%</div> </div> <div> <div>+</div> <div>Organic sales growth in relation to target value</div> <div>25%</div> </div> <div> <div>x</div> <div>0.8-1.2 Sustainability factor</div> </div> <div> <div>=</div> <div>0-180%</div> <div>of allocated units</div> </div>
	25-35%	<b>Profit Sharing</b> <ul style="list-style-type: none"> <li><b>Three-years average profit after tax</b> of the E. Merck KG, Darmstadt, Germany, multiplied with individual permille rate</li> <li><b>From 2021 reduced individual performance factor of 0.8-1.2</b> can increase (bonus) or decrease (malus) the amount based on a set of criteria, incl. the 3 sustainability goals, disclosure of catalogue and reasons for if performance factor ≠ 1.0</li> <li><b>Individual permille rate</b> for each board member and maximum € cap for each board member published</li> <li><b>Staggered incentivization</b> and <b>minimum threshold value</b> and maximum limit for profit after tax (0.75/2.0 bn €)</li> <li>Mandatory <b>personal investment in Group Shares</b> amounting to one third of the net payment of the profit sharing (4 year holding period)</li> </ul>	
Basic	6-9%	<b>Pension Entitlements</b>	Defined contribution
	0-3%	<b>Additional Benefits</b>	Mainly contributions to insurance policies, personal security expenses, company car...
	15-20%	<b>Basic Compensation</b> <ul style="list-style-type: none"> <li><b>Fixed and non-performance related compensation</b></li> <li>Paid in 12 equal monthly installments</li> <li>1.4 million € for the chairman / up to 1.1 million € for the members of the executive board</li> </ul>	
<b>Maximum total compensation: reduced to €11.5 m Chairman, €9.5 m other executive board members</b>			



# External stakeholders assess our engagement



As of 2021, we received an **MSCI ESG\* Rating of AAA.**

\*Environment, Social, Governance



2021, we received an **ESG Risk Rating** of 19.5 and **Sustainalytics: low risk** of experiencing material financial impacts from ESG factors.



Since 2008, Group is part of **FTSE4Good Index**, measuring the performance of companies with strong ESG practices (top 15).



In 2020, Group has once more achieved **prime status** by **ISS Oekom**.



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



We have been **reconfirmed** as a constituent of the **Ethibel Sustainability Index (ESI) Excellence Europe** since May 2020, based on VigeoEiris.



Group for the second time received platinum status in 2021, among the **top 1% of companies. EcoVadis** annually examines ~75,000 suppliers from 160 countries.



In the 2021 **Access to Medicine Index** Group ranked **eighth place**. We were recognized for our performance in R&D, where we ranked fifth.



**CDP Climate:** In 2020, we scored **"B"** (2019: C). **CDP Water:** In 2020, we received a **"B"** (2019: B).

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# Group

## Regular portfolio review remains key to success

### strong track record

- Acquisitions and divestments are part of Company'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



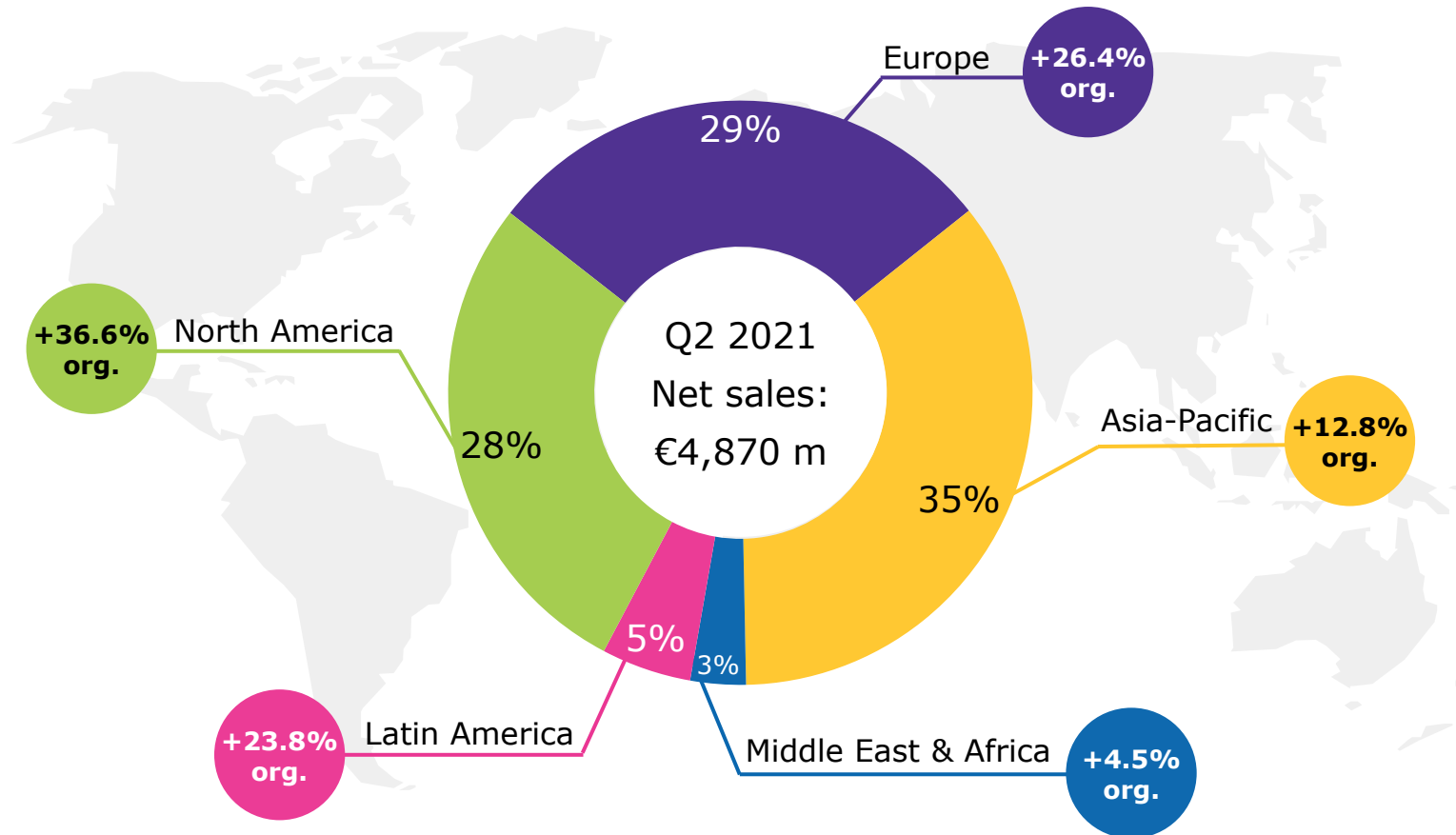
 **Current set-up is strong and organic investment opportunities are attractive**

 **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**

# Life Science demand and Healthcare recovery drive particularly strong growth in North America and Europe

## Regional breakdown of net sales [€m]



## Regional organic development

- APAC: Strong growth across all sectors particularly in Process Solutions, Fertility and Semiconductor Solutions
- Europe: Strong demand in Process Solutions and strong recovery in Fertility against heavily impacted Q2 2020 drive 26% growth
- North America: Growth across all sectors, particularly strong Life Science, Fertility & Oncology (supported by Eli Lilly supply agreement)
- LATAM growth driven foremost by Fertility and CM&E
- Fertility drives growth in ME&A



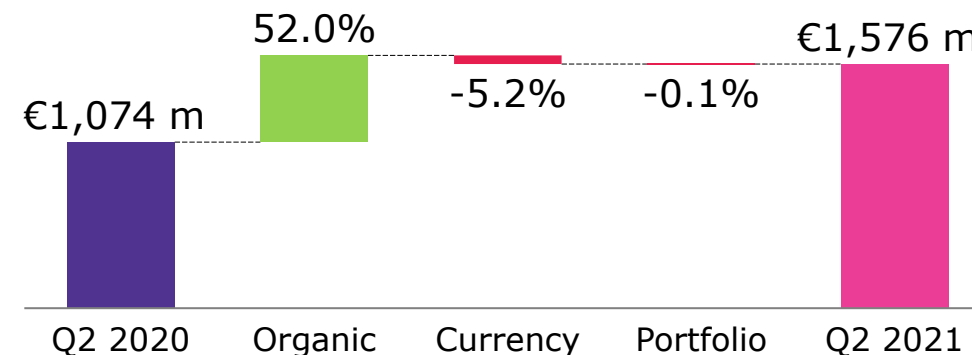
# Strong Life Science demand and robust Healthcare recovery drive 23% sales and 52% EBITDA pre organic growth

## Q2 YoY Net Sales

	Organic	Currency	Portfolio	Total
Healthcare	23.6%	-4.3%	0.0%	19.2%
Life Science	28.2%	-5.0%	0.0%	23.2%
Electronics	10.3%	-5.0%	0.0%	5.4%
<b>Group</b>	<b>23.0%</b>	<b>-4.8%</b>	<b>0.0%</b>	<b>18.2%</b>

- Strong recovery in Fertility well above pre COVID-19 levels, organic Mavenclad<sup>®</sup> growth of 102% and Oncology organic growth of +49% drive +24% growth in Healthcare overall
- Record 28% organic growth in Life Science; driven by all businesses with Process Solutions up +34%; Research Solutions +31% and Applied Solutions +13% against soft comps from lockdown
- Electronics growing 10% organically, driven by strong performance in Semiconductor Solutions (+12% org.) and strong recovery of Surface Solutions while Display Solutions declines slightly

## Q2 YoY EBITDA pre



- Organic EBITDA pre increases by more than 50% and more than twice as fast as sales
- Strong uptake in Life Science and Healthcare gross profit paired with continued cost discipline in all sectors vs. soft Q2 2020
- FX burden of -5% across various currencies with largest negative impact from USD and JPY; partly mitigated by hedging



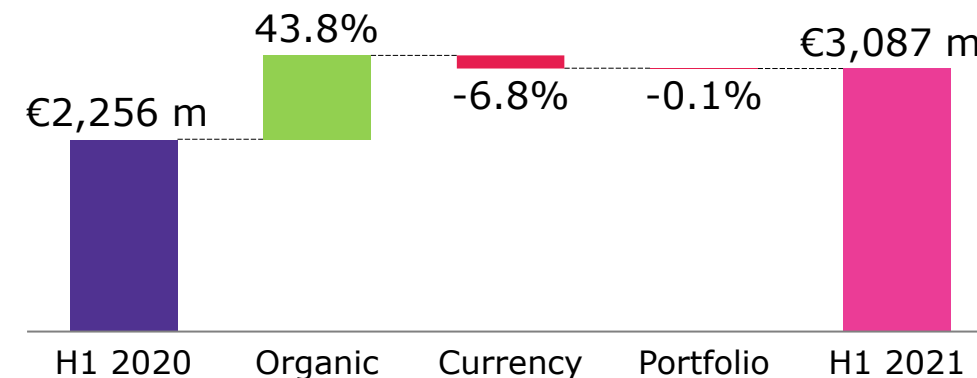
# Strong performance across all sectors drives 17% organic net sales growth and 44% organic EBITDA pre growth against COVID-19-impacted H1 2020

## H1 YoY Net Sales

	Organic	Currency	Portfolio	Total
Healthcare	12.9%	-5.2%	-0.6%	7.1%
Life Science	27.5%	-5.6%	0.0%	21.8%
Electronics	5.0%	-4.7%	0.0%	0.3%
<b>Group</b>	<b>17.4%</b>	<b>-5.3%</b>	<b>-0.2%</b>	<b>11.9%</b>

- Healthcare: +13% org. growth vs. COVID-19-impacted H1 2020, driven by strong recovery in Fertility, growth in Mavenclad® & Bavencio®; supported by Erbitux® Eli Lilly supply agreement
- Life Science: Up +28% as strong base business across all BUs is boosted by additional COVID-19 demand in Process and Research Solutions against lockdown-related soft comps
- Electronics: Grows +5% (above mid-term guidance) as strong performance in Semiconductor Solutions and recovery of Surface Solutions overcompensate stabilizing Display decline

## H1 YoY EBITDA pre

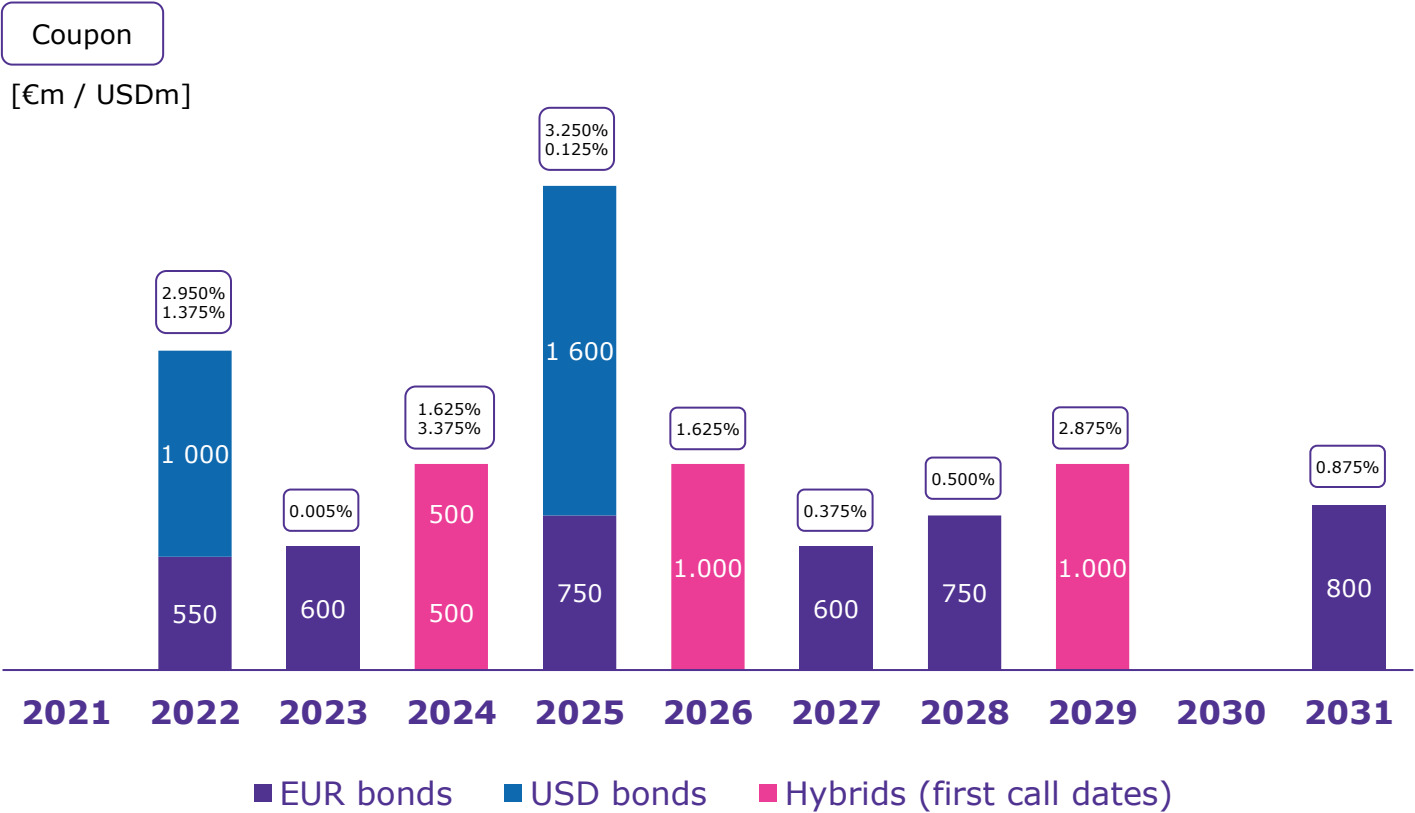


- EBITDA pre grows faster than sales organically, largely driven by strong operating leverage in Life Science and Healthcare vs. a weaker H1 2020
- FX headwinds primarily from USD, JPY & BRL amount to burden of -5% on net sales and -7% on EBITDA pre



# Credit details

## Maturity profile as of June 30, 2021



## Credit rating information

	LT Rating	Since	Outlook	ST Rating
Moody's	Baa1	12.12.14	Stable	P-2
S&P Global	A	29.05.13	Stable	A-1
SCOPE	A-	19.10.16	Stable	S-1



# Q2 2021: Overview

## Key figures

[€m]	Q2 2020	Q2 2021	Δ
Net sales	4,119	<b>4,870</b>	18.2%
EBITDA pre	1,074	<b>1,576</b>	46.7%
Margin (in % of net sales)	26.1%	<b>32.4%</b>	6.3pp
EPS pre	1.30	<b>2.24</b>	72.3%
Operating cash flow	502	<b>888</b>	76.9%

[€m]	Dec. 31, 2020	June 30, 2021	Δ
Net financial debt	-10,758	<b>-10,141</b>	-5.7%
Working capital	3,938	<b>4,222</b>	7.2%
Employees	58,096	<b>58,382</b>	0.5%

## Comments

- EBITDA pre & margin increase, driven by operating leverage in Life Science and Healthcare vs. LY COVID-19 burden
- EPS pre increase driven by EBIT pre, better financial result and lower tax rate vs. particularly soft Q2 2020
- Operating cash flow up 77% driven by higher profit after tax in all three sectors
- Ongoing reduction of net financial debt



# H1 2021: Overview

## Key figures

[€m]	H1 2020	H1 2021	Δ
Net sales	8,489	<b>9,501</b>	11.9%
EBITDA pre	2,256	<b>3,087</b>	36.9%
Margin (in % of net sales)	26.57%	<b>32.49%</b>	5.919%
EPS pre	2.80	<b>4.42</b>	57.9%
Operating cash flow	1,019	<b>2,104</b>	106.6%

[€m]	Dec. 31, 2020	June 30, 2021	Δ
Net financial debt	-10,758	<b>-10,141</b>	-5.7%
Working capital	3,938	<b>4,222</b>	7.2%
Employees	58,096	<b>58,382</b>	0.5%

## Comments

- Strong performance across all sectors drives +12% growth despite -6% FX
- EBITDA pre & margin increase, driven by operating leverage in Life Science and Healthcare vs. pandemic-impacted LY; further supported by Erbitux® Eli Lilly supply agreement (+€49 m net sales)
- EPS pre above last year driven by strong operating performance, supported by better financial result & lower tax rate
- Operating cash flow more than doubles as strong EBITDA pre growth supported by favorable net working capital





# Q2 2021: Reported figures

## Reported results

[€m]	Q2 2020	Q2 2021	Δ
EBIT	491	<b>1,049</b>	113.6%
Financial result	-102	<b>-95</b>	-7.3%
Profit before tax	389	<b>955</b>	145.4%
Income tax	-100	<b>-208</b>	107.9%
<i>Effective tax rate</i>	25.7%	<b>21.8%</b>	-3.9pp
Net income	290	<b>745</b>	157.1%
EPS (€)	0.67	<b>1.71</b>	155.2%

## Comments

- EBIT more than doubles, driven by strong performance across all sectors vs. Q2 2020 COVID-19 burden
- Improved financial result largely driven by lower interest expense from deleveraging
- Effective tax rate benefitting from boosted results in Life Science (better country mix)
- Strong EBIT growth, improved financial result and lower tax rate drive higher net income & EPS



# H1 2021: Reported figures

## Reported results

[€m]	H1 2020	H1 2021	Δ
EBIT	1,207	<b>2,092</b>	73.3%
Financial result	-201	<b>-154</b>	-23.3%
Profit before tax	1,006	<b>1,939</b>	92.6%
Income tax	-259	<b>-444</b>	71.2%
<i>Effective tax rate (%)</i>	25.8%	<b>22.9%</b>	-2.9pp
Net income	746	<b>1,492</b>	100.0%
EPS (€)	1.72	<b>3.43</b>	99.4%

## Comments

- EBIT increase driven by strong growth and operating leverage in all business sectors, particularly Life Science
- Improved financial result largely driven by lower interest expenses in line with deleveraging
- Effective tax rate in the middle of updated guidance range
- Doubled net income and EPS reflect positive development of EBIT, financial result and tax rate



# Cash flow statement

## Q2 2021 – Cash flow statement

[€m]	Q2 2020	Q2 2021	Δ
Profit after tax	289	<b>747</b>	458
D&A	559	<b>419</b>	-140
Changes in provisions	-54	<b>88</b>	142
Changes in other assets/liabilities	-166	<b>-217</b>	-50
Other operating activities	-13	<b>19</b>	32
Changes in working capital	-112	<b>-168</b>	-56
<b>Operating cash flow</b>	502	<b>888</b>	386
Investing cash flow	-216	<b>-241</b>	-25
thereof Capex on PPE	-194	<b>-256</b>	-62
Financing cash flow	-302	<b>-1,059</b>	-757

## Cash flow drivers

- Operating cash flow up €386 m driven primarily by higher profit after tax in all three sectors, particularly Life Science
- Delta in D&A driven by COVID-19 related impairments in Q2 2020
- Provisions up, driven by litigation accruals, pension fluctuations, and LTIP\*
- Higher outflow from working capital but growing considerably slower than sales
- Higher investments, particularly CAPEX on PPE in line with ongoing capacity expansion
- Financing cash flow explained by net repayment of bonds, bank liabilities and commercial papers



# Cash flow statement

## H1 2021 – cash flow statement

[€m]	H1 2020	H1 2021	Δ
Profit after tax	747	<b>1,495</b>	748
D&A	991	<b>843</b>	-148
Changes in provisions	-38	<b>55</b>	93
Changes in other assets/liabilities	-189	<b>-56</b>	133
Other operating activities	-24	<b>25</b>	48
Changes in working capital	-468	<b>-256</b>	212
Operating cash flow	1,019	<b>2,104</b>	1,086
Investing cash flow	-504	<b>-587</b>	-83
thereof Capex on PPE	-532	<b>-564</b>	-33
Financing cash flow	239	<b>-1,054</b>	-1,293

## Cash flow drivers

- Operating cashflow more than doubles as strong profit after tax is further boosted by favorable working capital
- Lower depreciation & amortization vs. H1 2020 which was elevated by COVID-19-related impairments in EL
- Changes in provisions elevated by mid double-digit €m litigation accrual
- Changes in other assets and liabilities largely explained by Q1 tax positions
- Favorable lower increase in working capital driven by higher inventories in 2020 to secure supply amid COVID-19
- Financing cash flow explained by net repayment of bonds, bank liabilities and commercial papers



# Adjustments in Q2 2021

## Adjustments in EBIT

[€m]	Q2 2020		Q2 2021	
	Adjustments	thereof D&A	Adjustments	thereof D&A
Healthcare	15	0	<b>11</b>	3
Life Science	-15	0	<b>-6</b>	0
Electronics	131	112	<b>10</b>	5
Corporate & Other	8	0	<b>97</b>	0
Total	138	112	<b>112</b>	8



# Adjustments in H1 2021

## Adjustments in EBIT

[€m]	H1 2020		H1 2021	
	Adjustments	thereof D&A	Adjustments	thereof D&A
Healthcare	-12	2	<b>21</b>	3
Life Science	-4	0	<b>8</b>	0
Electronics	165	112	<b>27</b>	7
Corporate & Other	25	0	<b>103</b>	1
Total	174	114	<b>159</b>	11





## Financial Calendar

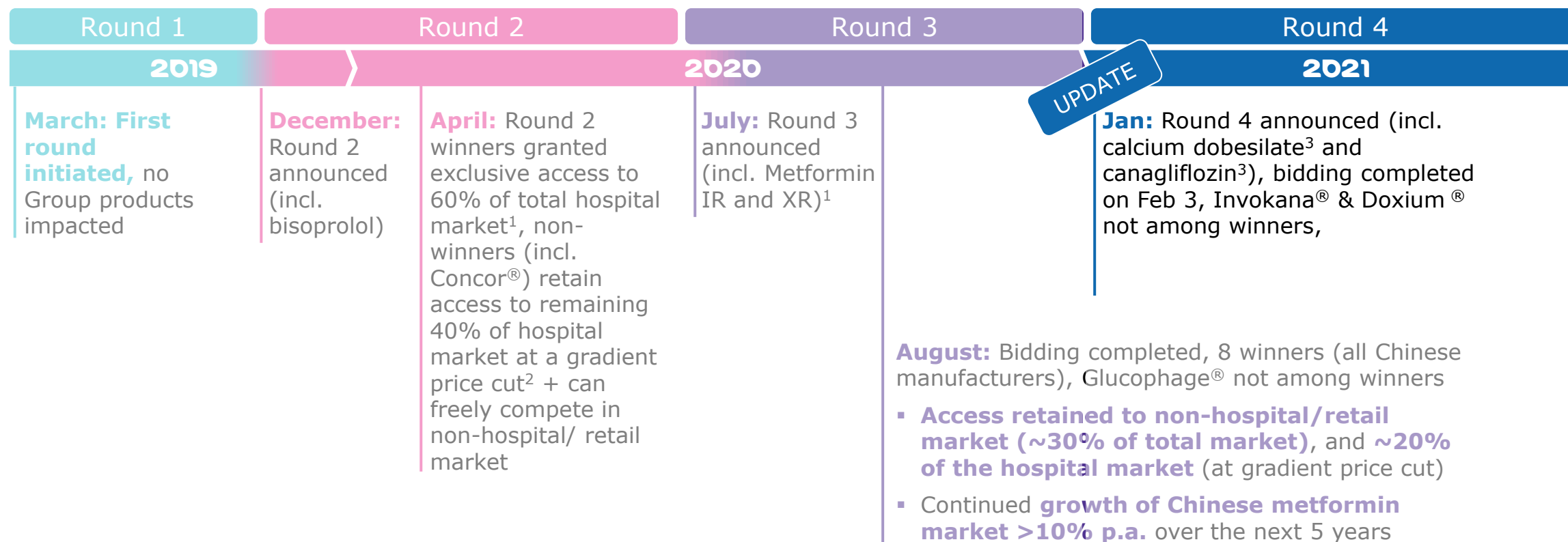
Date	Event
August 5, 2021	Q2 2021 Earnings release
September 9, 2021	Virtual Capital Markets Day
November 11, 2021	Q3 2021 Earnings release
April 22, 2022	<i>Annual General Meeting</i>
August 4, 2022	Q2 2022 Earnings release



Healthcare



# China's VBP: Round 4 implementation near completion, confidence in approx. stable base business through 2021 and 2022 sustained



China Glucophage sales represent **only ~8% of the total base business** (2020 net sales)  
 Sustained confidence in **approx. stable base business (org.) through 2021 and 2022**

1: hospital market for bisoprolol and metformin makes up ~70% of total market, this includes urban hospitals, rural hospitals, and community health centers; 2: Concor® price cut in the high single digit %; 3: alliance products;  
 Acronyms: VBP = Volume-Based Procurement



## Phase I

**M1231**  
**Bispecific MUC1xEGFR**  
**ADC**  
Solid tumors

**M1774**  
**ATR inhibitor**  
Solid tumors<sup>1</sup>

**M4076**  
**ATM inhibitor**  
Solid tumors

**peposertib**  
**DNA-PK inhibitor**  
Solid tumors<sup>2</sup>

**bintrafusp alfa**  
**TGFbeta trap/anti-PD-L1**  
Cervical cancer 1L

**M6223**  
**anti-TIGIT mAb**  
Solid tumors<sup>3</sup>

**enpatoran (M5049)**  
**TLR7/8 antagonist**  
Systemic lupus erythematosus /  
Cutaneous lupus erythematosus

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

## Phase II

**berzosertib**  
**ATR inhibitor**  
Small-Cell Lung Cancer<sup>4</sup>

**tepotinib**  
**MET kinase inhibitor**  
Metastatic Colorectal Cancer  
*RAS/BRAF* wt, *MET* amplified<sup>5</sup>

**tepotinib**  
**MET kinase inhibitor**  
Non-small cell lung cancer,  
*EGFR* mutant, *MET* amplified<sup>6</sup>

**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**  
Cervical cancer 2L

**bintrafusp alfa**  
**TGFbeta trap/anti-PD-L1**  
Triple negative breast cancer  
(HMGA2 positive)

**enpatoran (M5049)**  
**TLR7/8 antagonist**  
COVID-19 pneumonia

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

## Phase III

**xevinapant**  
**IAP inhibitor**  
Locally advanced squamous cell carcinoma  
of the head and neck<sup>7,8</sup>

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

**evobrutinib**  
**BTK inhibitor**  
Relapsing multiple sclerosis

## Registration

**tepotinib**  
**MET kinase inhibitor**  
Non-small cell lung cancer,  
*MET*ex14 skipping<sup>9</sup>

ADC: Antibody Drug Conjugate; 1L: first-line treatment; 2L: second-line treatment

<sup>1</sup> Study as monotherapy and in combination with niraparib. <sup>2</sup> Study in combination with avelumab. <sup>3</sup> Includes study in combination with bintrafusp alfa. <sup>4</sup> Includes studies (phase I/II) in collaboration with/ sponsored by external partners, e.g. US National Cancer Institute (NCI). <sup>5</sup> In combination with cetuximab. <sup>6</sup> In combination with osimertinib. <sup>7</sup> In unresected LA SCCN patients eligible for cisplatin. <sup>8</sup> On March 01, 2021, Merck KGaA, Darmstadt, Germany announced a worldwide in-licensing agreement with Debiopharm, Switzerland, for the development and commercialization of xevinapant (Debio 1143). <sup>9</sup> As announced on November 26, 2020, the European Medicines Agency (EMA) has validated for review the application for tepotinib for the treatment of adult patients with advanced non-small cell lung cancer.

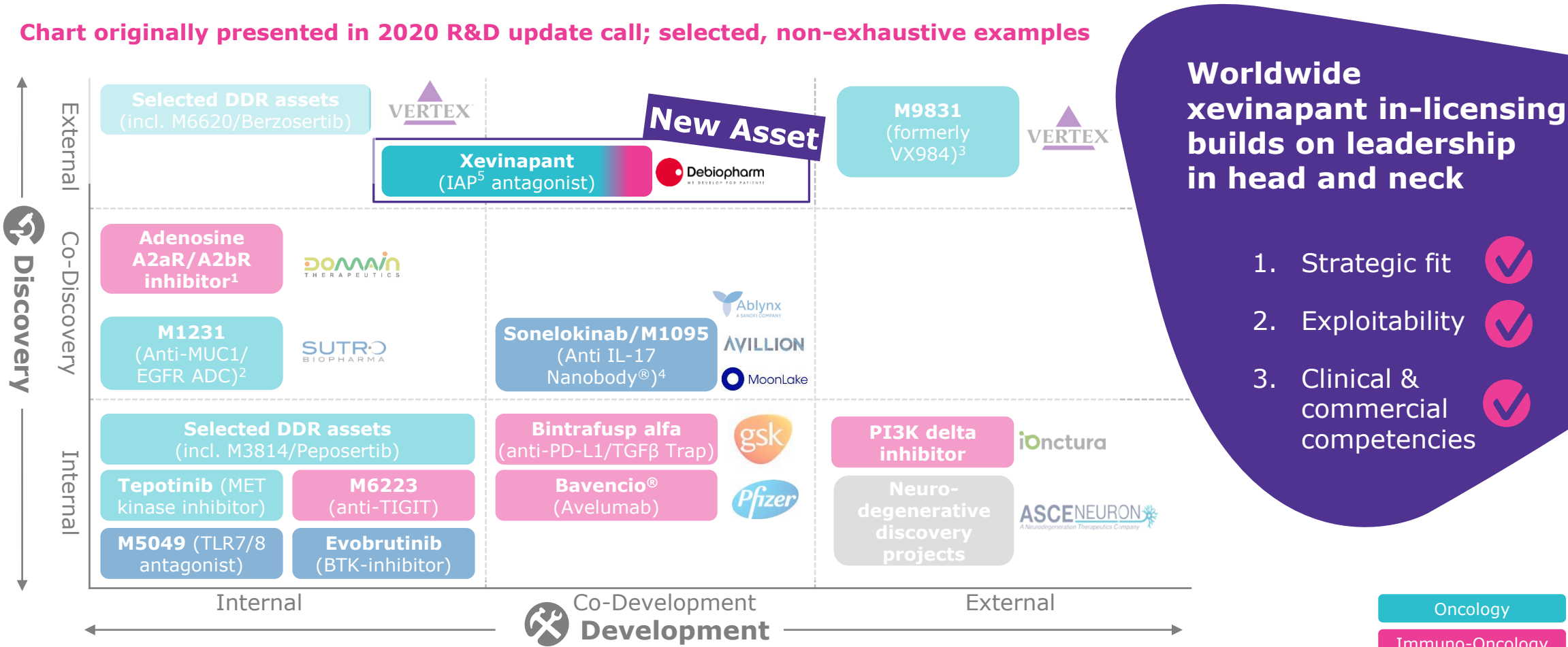
Additional information: Several combination studies (phase II) of avelumab with talazoparib, axitinib, ALK inhibitors or chemotherapy ongoing under sponsorship of Pfizer.

Unless noted otherwise, clinical programs conducted in collaboration with external partners are not shown unless Merck KGaA, Darmstadt, Germany has co-ownership of data. In such case the indication is shown in *Italics*. 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.



# Xevinapant

## Potential to become standard of care in core area for the Group

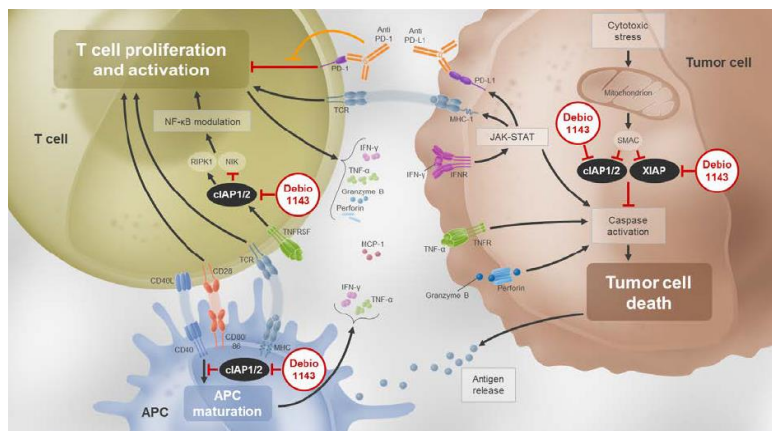


1: In 2017, Domain Therapeutics and Merck KGaA, Darmstadt, Germany entered into a collaboration and licensing agreement for the development of adenosine receptor antagonist drugs specifically designed for oncology and immuno-oncology; 2: In 2014, Sutro and Merck KGaA, Darmstadt, Germany initiated a collaboration to discover and develop ADCs utilizing Sutro's cell-free protein synthesis platform, Xpress CF+™. Merck KGaA, Darmstadt, Germany is responsible for drug product, clinical development and commercialization of any resulting products; 3: In 2019, an exclusive license was granted to Vertex for the use of M9831 in gene-editing applications; 4: Avillion conducted Ph II of M1095 in Psoriasis, Group decided to out license sonelokinaab to a new partner to initiate Phase III development in 2021 5: Inhibitor of Apoptosis Proteins

# Xevinapant (Debio 1143)

## Potentially first in class oral IAP antagonist with FDA BTB

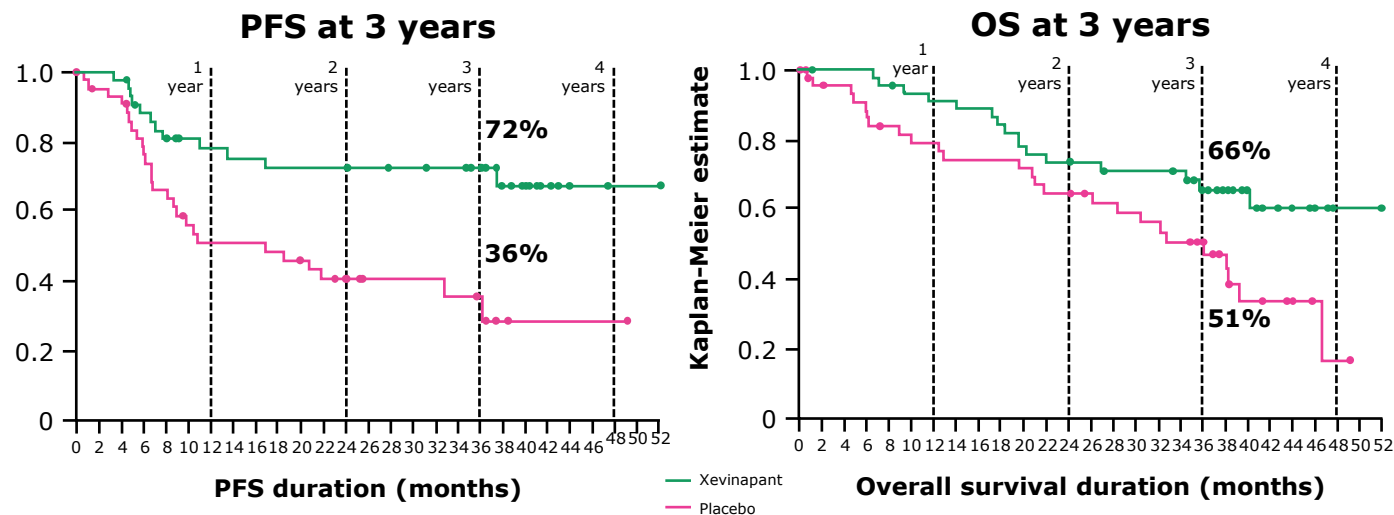
### Mode of Action<sup>1</sup>



- Oral Inhibitor of Apoptosis Proteins (IAP) antagonist: chemo-/radio-sensitizer & enhancer of anti-tumor immunity
- IAP antagonists tackling two cancer hallmarks:
  - Enhancing anti-tumor immunity
  - Lowering threshold for tumor cell death

### Compelling Phase 2 data<sup>2</sup> published in *The Lancet Oncology*, and presented at ESMO 2020

- **Improvement in OS statistically significant** and clinically meaningful: **HR 0.49** (0.26–0.92);  $p=0.0261$
- **Clinically compelling PFS improvement: HR 0.34** (0.17–0.68);  $p=0.0023$
- Predictable and manageable safety profile without substantial additional toxicity to standard CRT



Acronyms: BTB = Breakthrough Therapy Designation; IAP = Inhibitor of Apoptosis Proteins; 1: Debiopharm; 2: ESMO 2020 - Late Breaking Abstract 39 - 3-years follow-up of double-blind randomized phase II comparing concurrent high-dose cisplatin chemo-radiation plus xevinapant or placebo in high-risk patients with locally advanced squamous cell carcinoma of the head and neck

# Xevinapant

## Total deal-volume of up to ~ €900 m and industry-typical sales royalties

Payment type	Amount (in €)	Accounting treatment <sup>2</sup>
Upfront payment	~ €190 m	Largest part to be capitalized as an intangible asset
Approval milestones	Up to ~ €380 m <sup>1</sup>	To be paid and capitalized as an intangible asset upon approval and to be amortized once asset is ready for use
Commercial milestones	Up to ~ €330 m	To be paid and capitalized as an intangible asset, based on sales thresholds and to be amortized over remaining useful life
Sales	n/a	Merck KGaA, Darmstadt, Germany to recognize sales globally (incl. US)
R&D Costs	n/a	For ongoing TrilynX study <ul style="list-style-type: none"> <li>▪ Cash view: 50/50 cost sharing</li> <li>▪ P&amp;L view: fully shown in Company P&amp;L</li> </ul> 2nd study for cisplatin-ineligible patients: Group incurs 100% of cost
Royalties	n/a	Group to pay industry-typical sales royalty to Debiopharm

<sup>1</sup> thereof up to ~€300 m for focus H&N indications)

<sup>2</sup> final accounting treatment is still subject to alignment with auditors

# Xevinapant (Potentially first in class oral IAP antagonist)

## Two Phase III studies are designed to target the majority of unresectable LA SCCHN patients receiving systemic therapy + RT



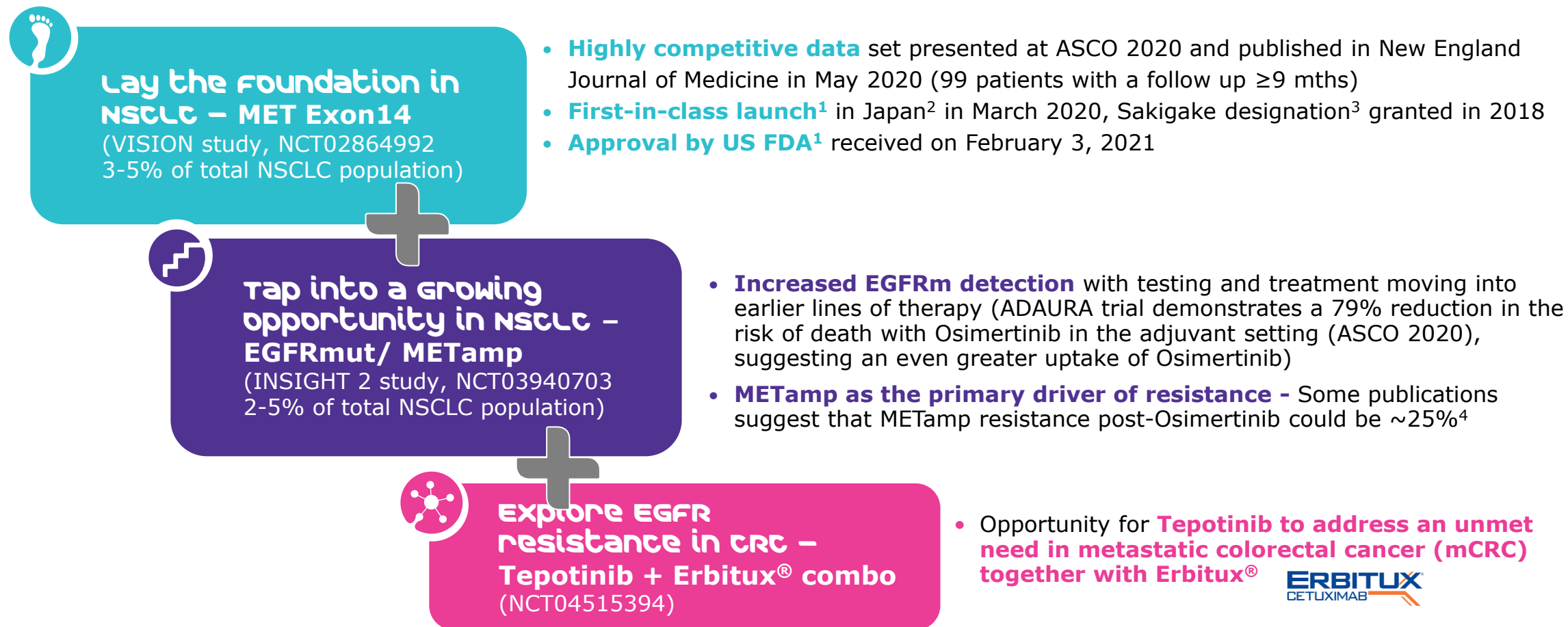
**Blockbuster potential provided success of both studies**



**20,000+ unresectable LA SCCHN patients in US and EU-5 each**

# Tepotinib (MET kinase inhibitor)

## First-in-class launch in MET Exon14 sets foundation for EGFRm/ METamp opportunity and exploration in other tumor types



1: approved for both treatment naïve and previously treated METex14 positive NSCLC patients; 2: second largest Oncology market globally; 3: SAKIGAKE designation promotes research and development in Japan, aiming at early practical application for innovative pharmaceutical products; 4: Piotrowska et al., "Landscape of Acquired Resistance to Osimertinib in EGFR -Mutant NSCLC and Clinical Validation of Combined EGFR and RET Inhibition with Osimertinib and BLU-667 for Acquired RET Fusion", AACR Cancer Discovery 2018; Acronyms: CRC = Colorectal cancer; EGFR = Epidermal Growth Factor Receptor; NSCLC = Non-small cell lung cancer



# Tepotinib (MET kinase inhibitor)

## Tapping into the rapidly evolving EGFRmut/METamp market – Encouraging INSIGHT 1 data



### INSIGHT 2 – Tepotinib + Osimertinib in Osimertinib Relapsed METamp NSCLC

Recruiting

- **Study design recently amended to reflect evolved and future standard of care:**
  - **Target population** – Inclusion criteria adjusted to focus solely on 1L Osimertinib failures
  - **Testing** - Streamline patient enrollment based on current gold standard method (TBx FISH)
  - **Increasing METamp prevalence** - Some publications suggest that METamp resistance post-Osimertinib could be ~25%<sup>1</sup>
- Estimated primary completion date: **November 2022**



### Tepotinib + Erbitux® (Cetuximab) - Addressing a significant medical need in 2L metastatic colorectal cancer (mCRC)

Recruiting

- Opportunity for **Tepotinib to address an unmet need in CRC** together with Erbitux®
- Estimated primary completion date: **March 2023**

### A solid foundation - Encouraging INSIGHT 1 data (18-months follow-up presented at WCLC 2019)<sup>2</sup>

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



**Proof of Concept: MET amplification can be considered a suitable biomarker** for treatment with Tepotinib



**Safety:** generally **well-tolerated**, most adverse events mild to moderate

1: Piotrowska et al., "Landscape of Acquired Resistance to Osimertinib in EGFR -Mutant NSCLC and Clinical Validation of Combined EGFR and RET Inhibition with Osimertinib and BLU-667 for Acquired RET Fusion", AACR Cancer Discovery 2018; 2: 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; Acronyms: FISH = Fluorescence in situ hybridization; TBx = Tissue Biopsy

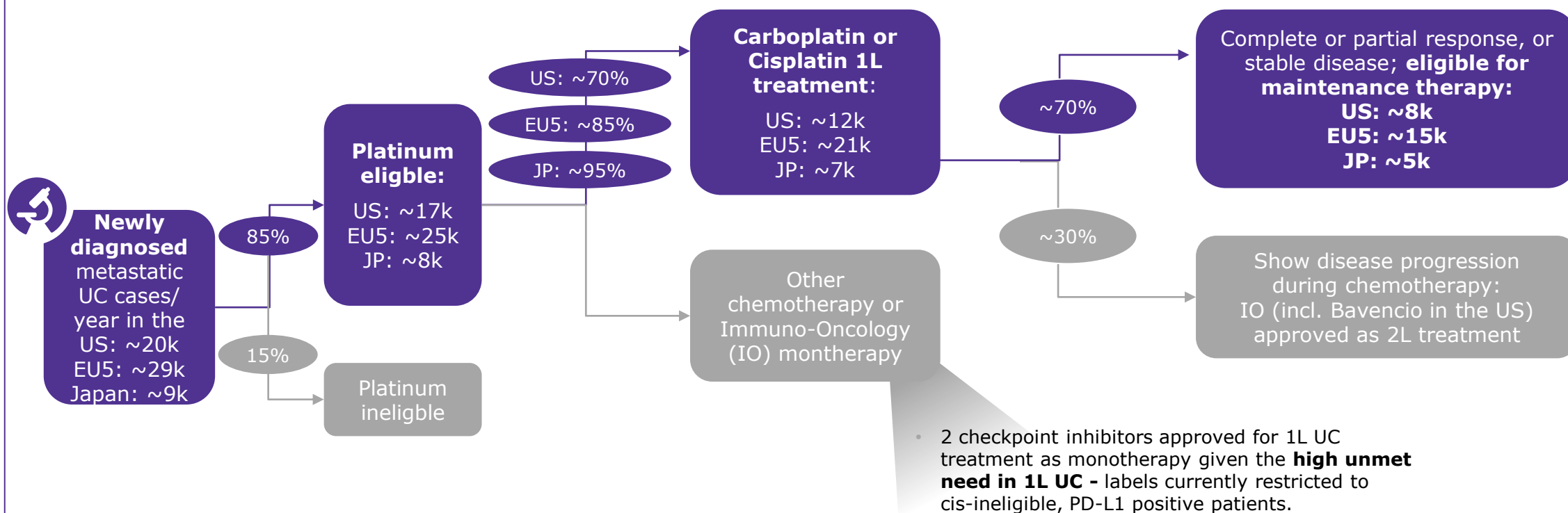




# Bavencio® (Avelumab) – Urothelial Carcinoma (UC 1L)

**UC 1L maintenance treatment achieving transformative OS benefit (31% reduction in risk of death, 7 months increase in median overall survival)**

**Durable responses to standard of care (1L chemotherapy) are rare with most patients experiencing progression within 9 months of treatment<sup>1</sup>**



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

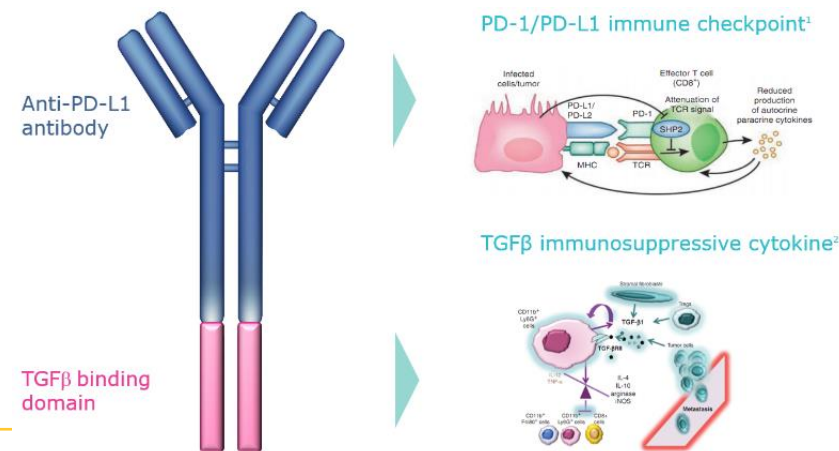
Bintrafusp alfa<sup>1</sup>

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



### Mode of action

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



### Clinical development achievements

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



### Clinical development plans

- **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**


<sup>1</sup>proposed International Nonproprietary Name (INN)

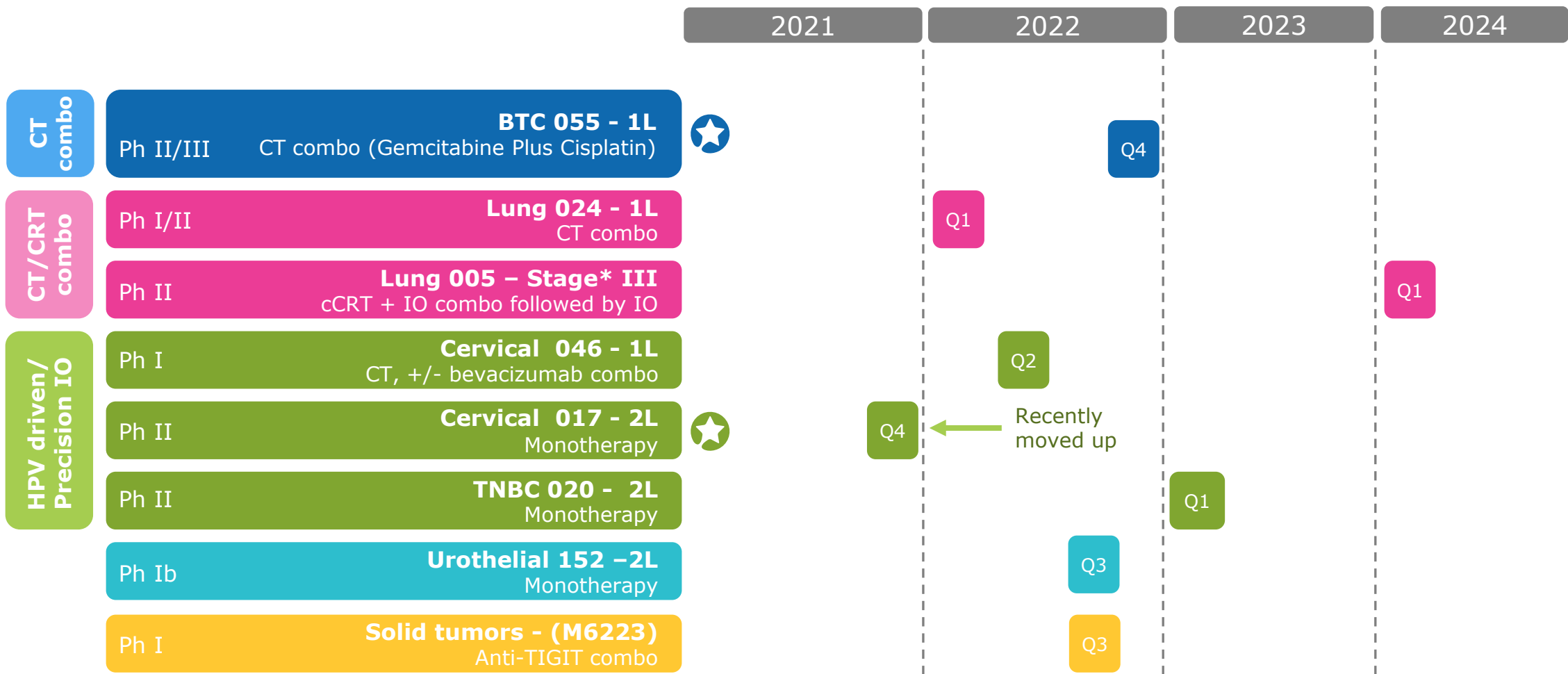
Acronyms: NSCLC = Non-small Cell Lung Cancer, IO = Immuno-Oncology



# Bintrafusp alfa

## INTR@PID Program: Upcoming Readouts

 Registrational potential

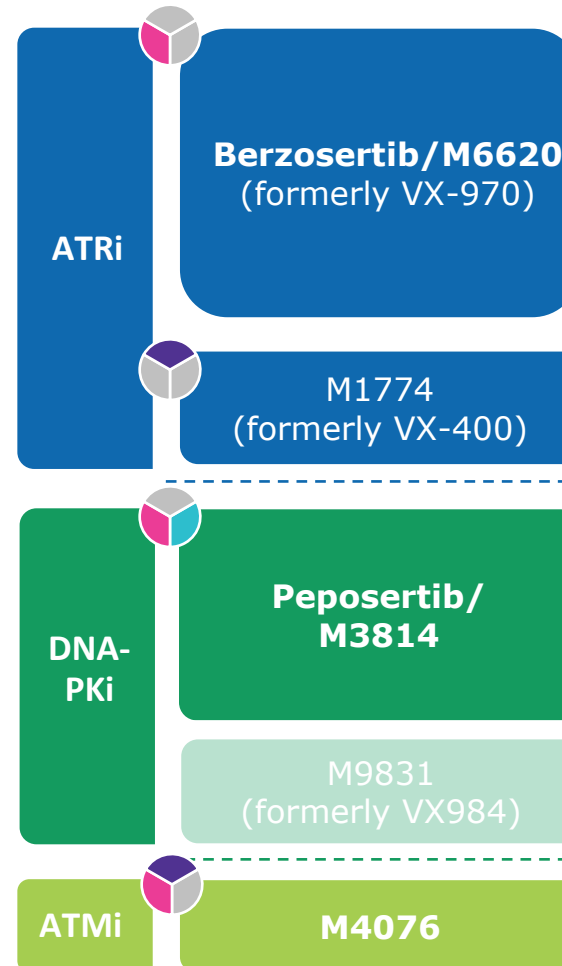
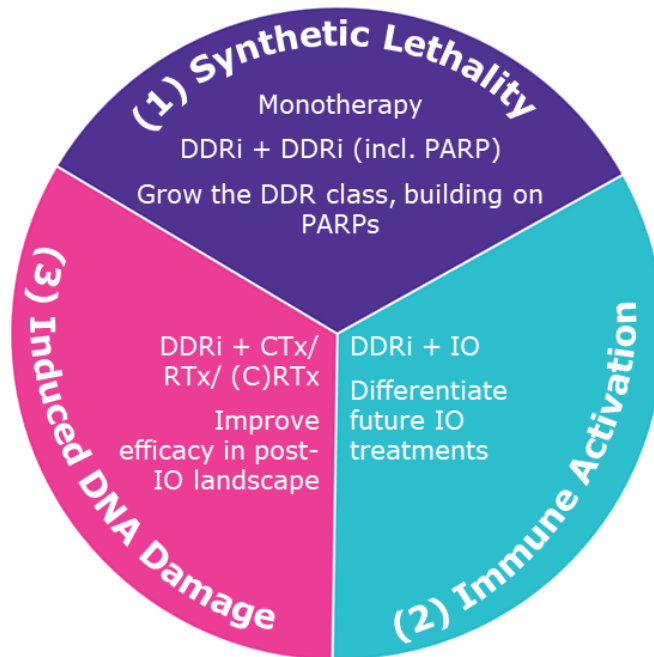


Acronyms: BTC = Biliary Tract Cancer; CT = Chemotherapy; EMT = Epithelial-mesenchymal transition; HPV = Human papillomavirus; NSCLC = Non-small Cell Lung Cancer; RT = Radiation therapy; TNBC = Triple-Negative Breast Cancer; \* unresectable; **All clinical timelines are event-driven and may be subject to change**



# DNA Damage Response (DDR)

## Leading DDR portfolio with a broad clinical program



- Only ATR-inhibitor with a POC from an RCT (Ovarian cancer, Berzosertib +/- Gem)
- Promising Ph II POC data from NCI study recently published in Cancer Cell
- Phase II study (NCT04768296) of Berzosertib + Topotecan in SCLC recently started
- Multiple NCI studies in various tumor types ongoing



Update

- Oral ATRi
- Phase I FiH study (monotherapy & combination with PARPi) ongoing

Update

- Rectal cancer (CRT combo): discontinued after Ph Ib
- Combo with Avelumab: Study with and w/o RT ongoing (PhI, solid tumors)
- Multiple NCI studies in various tumor types ongoing

Update



- Exclusive license<sup>1</sup> granted to Vertex in 2019 for use in gene-editing applications

- Phase I FiH study in advanced solid tumors (NCT04882917) ongoing

Update

1: incl. upfront payment + milestone/royalties on future sales; Acronyms: ATMi = Ataxia telangiectasia-mutated; ATRi = Ataxia telangiectasia and Rad3-related inhibitors; CRT = Chemoradiotherapy; DDR = DNA Damage Response; DNA-PKi = DNA-dependent Protein Kinase Inhibitor; FiH = First in Human; PARP = poly(ADP-ribose) polymerase inhibitor; POC = Proof of concept; RCT = Randomized Controlled Trial; RT = Radiation Therapy

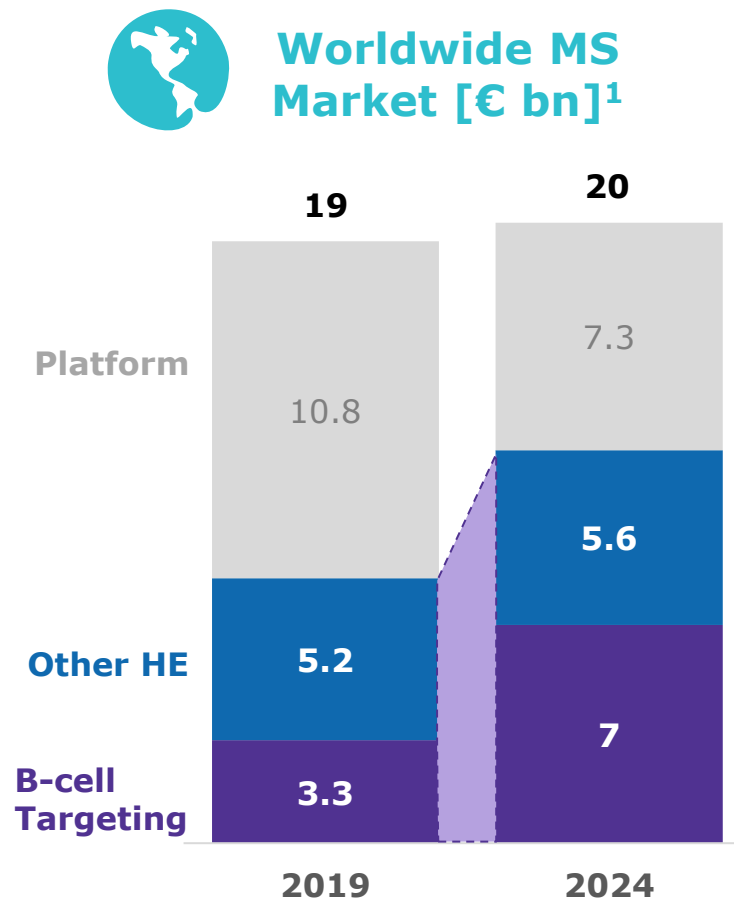


We pioneered BTKi development for MS with Evobrutinib

## Potential to have 3 complementary MS branded products by 2025

### Unmet need in Multiple Sclerosis (MS) – Need for new mechanisms to control disease

- ~50% of patients with **Relapsing MS (RMS)** continue to have ongoing disease activity over 2 years even when treated with the most effective agents
- No therapy with impact on **progression** mediated by **CNS myeloid cells**
- **Systemic side effects** of therapies limit patient acceptance and compliance
- All approved higher efficacy therapies **associated with elevated risk of infection**



### B-Cell Targeting + High-Efficacy (HE) Orals represent >60% of MS sales

- ✓ **BTKi is a novel class** of non-depleting therapies selectively targeting both B-cells and innate immune cells including disease progression-relevant microglia
- ✓ Merck KGaA, Darmstadt, Germany was the **first to conduct a full Phase II dose-ranging study in MS with Evobrutinib**, a highly selective covalent BTKi<sup>2</sup>
- ✓ **Merck KGaA, Darmstadt, Germany** is a **growing MS player** and could have 3 complementary branded products by 2025 – Mavenclad®, Rebif®, Evobrutinib

Platform agents – interferons, copaxone, DMFs and Teriflunomide; Other HE (high-efficacy) – cladribine, S1Ps, alemtuzumab; B-cell Targeting – ocrelizumab, ofatumumab, ublituximab. Includes branded products, generics and biosimilars; 1: Merck KGaA, Darmstadt, Germany internal estimates; 2: Montalban et al. NEJM 2019; 380:2406-2417; Acronyms: BTKi = Bruton's tyrosine kinase inhibitor



# Evobrutinib stands out amongst BTK inhibitors under development

## Uniquely positioned both in terms of clinical evidence and mode of action

		Fenebrutinib##	Tolebrutinib**	Evobrutinib
Clinical Evidence	Long-term* <b>efficacy on relapses</b>	✗	✗	✓ <sup>(1)</sup>
	Long-term* <b>safety</b>	✗	✗	✓ <sup>(1)</sup>
	<b>Convenience</b> (oral)	✓ BID	✓ QD	✓ BID
	<b>Exposure in CSF</b>	✗	✓ <sup>(2, ##)</sup> in HV	✓ <sup>(3)</sup> in MS
	<b>Biomarker of inflammation and progression in MS patients</b> (sNfL)	✗	✗	✓ <sup>(3)</sup>
Preclinical data	<b>BTK occupancy in the CNS</b>	✗	✓ <sup>(4)</sup>	✓ <sup>(5)</sup>
	<b>Efficacy in progressive EAE model and reduction of leptomeningeal inflammation#</b>	✗	✗	✓ <sup>(6-8)</sup>



**Phase III studies: Recruitment on track → Target data in-house in Q4 2023 and potential filing shortly after**

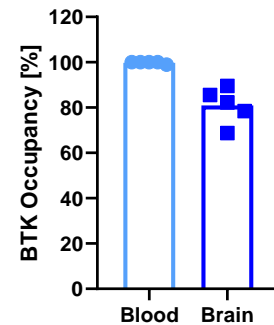
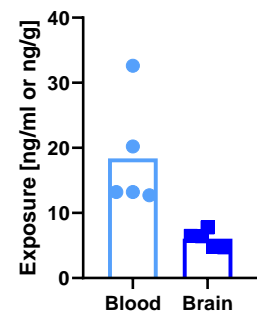
✗ : not reported



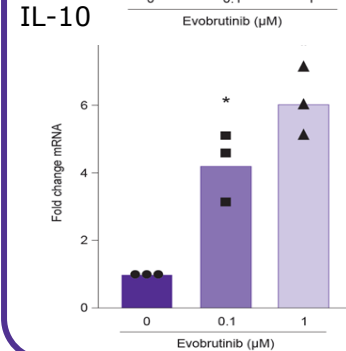
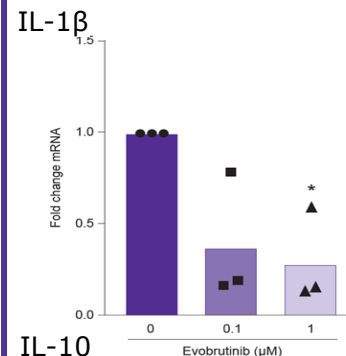
## Dual mechanism of action offers an innovative oral approach to MS therapy

The diagram illustrates the CNS-directed autoimmune responses involving T cells, B cells, Microglia, and Macrophages. A central purple circle labeled "CNS-directed autoimmune responses" is the hub. It is connected to four cells: a yellow T cell (top left), a blue B cell (top right), an orange Microglia cell (bottom right), and a green Macrophage (bottom left). Grey double-headed arrows connect the T cell to the B cell, the B cell to the Microglia, the Microglia to the Macrophage, and the Macrophage to the T cell, forming a cycle. Pink arrows point from the T cell, B cell, and Microglia towards the central purple circle, while a dashed pink arrow points from the Macrophage towards it. The text "Evobrutinib targets" is at the top right.

Evobrutinib is a CNS penetrant BTKi<sup>2</sup>



## Macrophages after GM-CSF activation

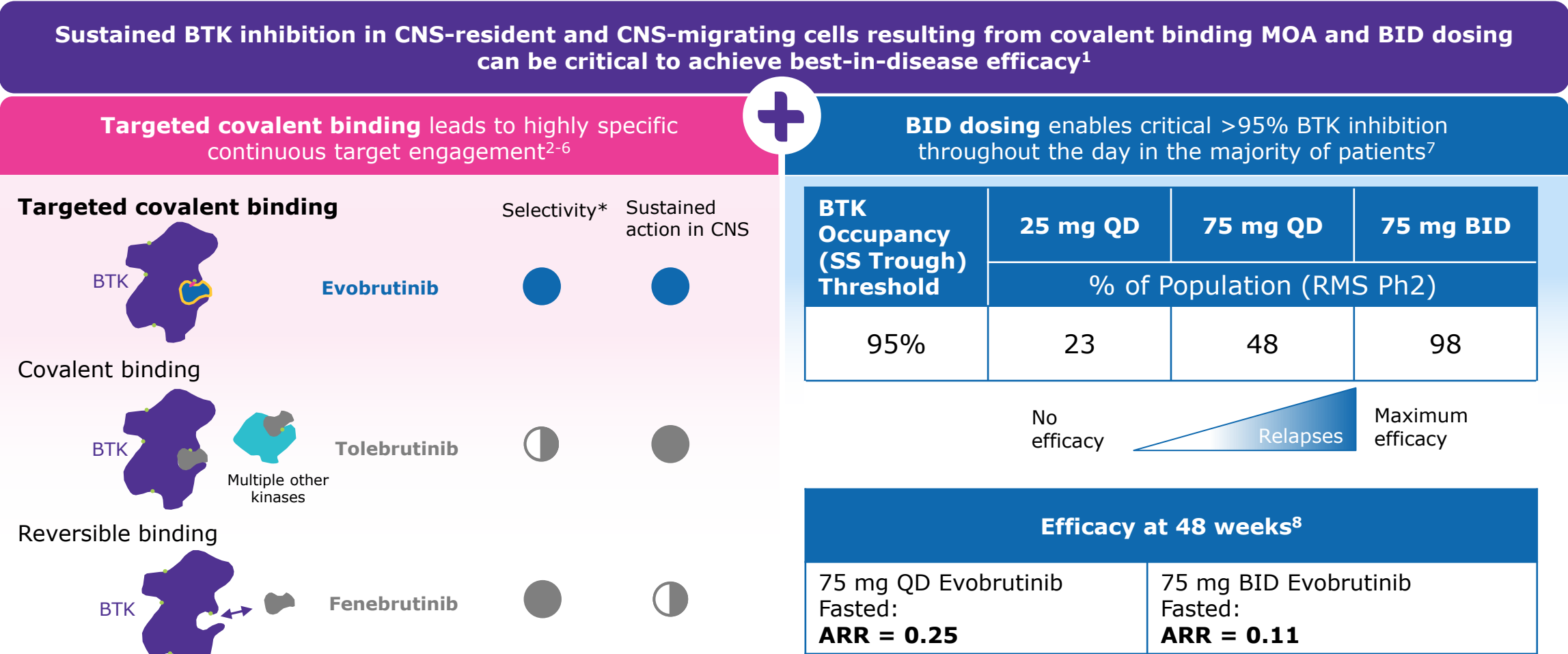


## Leptomeningeal structures

- Important role of macrophage/ microglia cells in addition to B and T cells in both **periphery and CNS**<sup>1</sup>
- Evobrutinib **reaches brain** to potentially impact compartmentalized inflammation<sup>2</sup>
- Effects may be mediated through effects on **CNS-resident and CNS-migrating cells**<sup>3,4</sup>

# Evobrutinib is optimally dosed to offer best-in-class BTK inhibition

## Optimized dose selection & targeted covalent binding results in sustained BTK inhibition that is necessary for robust efficacy



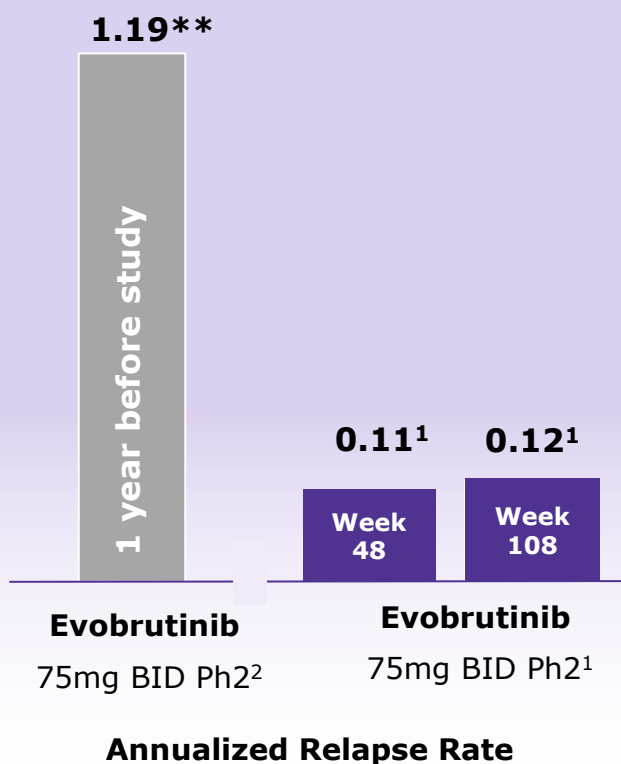


# Evobrutinib holds unmatched Long-Term Data among BTKi class in MS

## Best-in-disease efficacy & favorable safety over 2 years in largest Phase II study in MS



### Very high, sustained efficacy



### Early and substantial impact on sNfL\*



- Evobrutinib is the **only BTKi to have demonstrated very high, sustained efficacy and favorable safety** in the largest Phase II study in MS (n=267), with an ARR of confirmed relapses of 0.12 up to 108 weeks¹
- Evobrutinib **impacts sNfL levels**, a biomarker of neuronal damage, reflecting **disease activity and drug response in patients with MS³**, **starting at 12 weeks** and maintained through 24 weeks²
- Evobrutinib is **highly selective resulting in targeted kinase inhibition**, and its safety data in >1200 patients over 2+ years supports the potential for an **optimal long-term safety profile²**

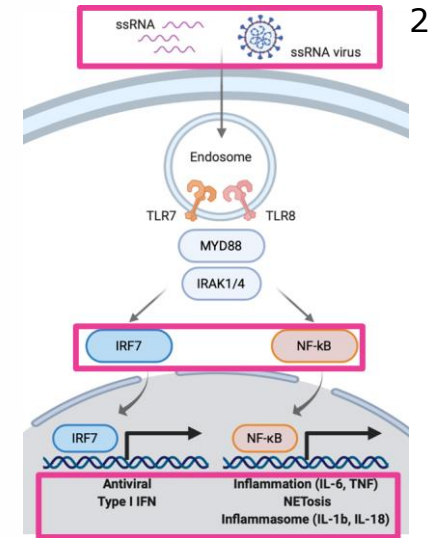


## M5049 (TLR7/8 antagonist)

### TLR7/8 are drivers of SLE pathology and possibly of COVID-19

#### Mechanism of Action<sup>1</sup>

- M5049 (**discovered in-house**) is a **potentially first-in class small molecule** that blocks activation of Toll-like receptors TLR7 and TLR8, two innate immune sensors that detect single-stranded (ss) RNA from viruses such as SARS-COV-2, the virus responsible for COVID-19, and inflammatory self-RNAs in the context of autoimmunity
- Activation of TLR7/8 leads to immune cell activation and inflammation, which when not properly controlled can cause severe immunopathology



#### Results from Phase I study in healthy volunteers

(NCT03676322)<sup>1</sup>

- **Well-tolerated** over the dosing interval, no significant or dose-limiting adverse event
- Pharmacokinetic parameters linear and dose-proportional from 1 to 200 mg
- Exposure-dependent inhibition of ex vivo-stimulated IL-6 secretion observed, with maximum inhibition achieved at 200 mg



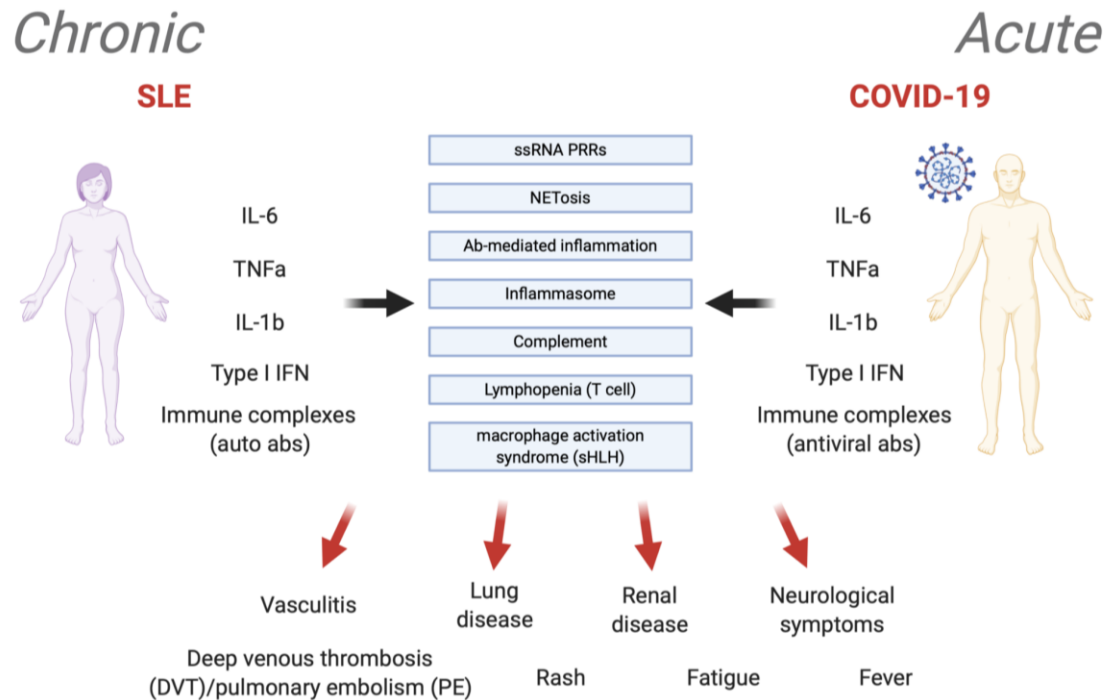
**Preliminary Phase I data warrant further investigation as a potential treatment for autoimmune diseases including SLE**

1: Port et al., A PHASE I, FIRST-IN-HUMAN STUDY TO ASSESS THE SAFETY, PHARMACOKINETICS AND PHARMACODYNAMICS OF SINGLE AND MULTIPLE ASCENDING DOSES OF M5049, A DUAL ANTAGONIST OF TLR7/8, IN HEALTHY SUBJECTS, *Lupus Science & Medicine* 2020;7(Suppl 1):A1–A131, conference cancelled due to COVID-19; 2 Adapted from ImmunoHorizons July 1, 2018 Dowling, D; Acronyms: SLE = Systemic lupus erythematosus; TLR = Toll-like receptors

# M5049 (TLR7/8 antagonist)

## Similarities between SLE and COVID-19

### Similarities between SLE and COVID-19<sup>1</sup>



1: Illustration created in-house; Acronyms: SLE = Systemic lupus erythematosus

### Phase II study started in July 2020

#### Rational:

- Investigate if M5049 intervention at critical point in course of COVID-19 disease may prevent or ameliorate hyper-inflammatory response in patients with COVID-19 pneumonia and **prevent progression to 'cytokine storm'**
- Successful intervention with investigational drug may reduce life-threatening complications of COVID-19, including severe respiratory symptoms often necessitating further interventions such as mechanical ventilation

#### Design:

- Phase II randomized, controlled clinical study
- Commenced in July 2020

#### Results:



Dependent on recruitment and COVID-19 infection rates  
**Data read-out expected in Q3/Q4 2021**

# Healthcare Q2: Strong Fertility recovery & Bavencio® performance; Mavenclad® returns to sequential growth as dynamic market picks up

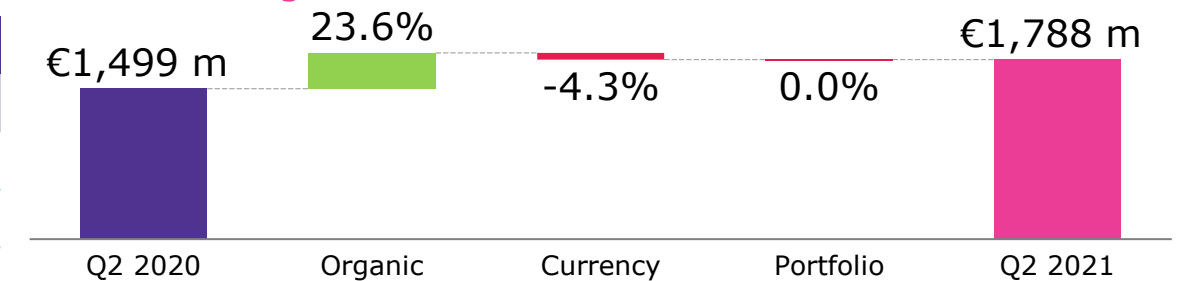
## Healthcare P&L

[€m]	IFRS		Pre	
	Q2 2020	Q2 2021	Q2 2020	Q2 2021
Net sales	1,499	1,788	1,499	<b>1,788</b>
M&S*	-409	-391	-401	<b>-389</b>
Admin	-81	-78	-79	<b>-76</b>
R&D	-366	-415	-366	<b>-414</b>
EBIT	269	501	284	<b>512</b>
EBITDA	359	572	-	<b>-</b>
EBITDA pre	374	581	374	<b>581</b>
(in % of net sales)	24.9%	32.5%	24.9%	<b>32.5%</b>

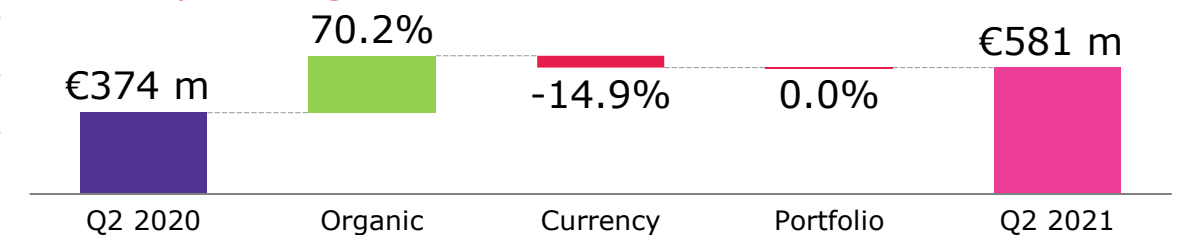
## Comments

- Mavenclad® grows +102 % organically to €157 m, amid first signs of recovery of dynamic market and low comps; Rebif® declines -9%
- Oncology up +49%; Bavencio® grows +206% fueled by UC 1L launch in key markets; Erbitux® up +36% supported by Eli Lilly supply agreement
- Base business up +15%, driven primarily by strong Fertility recovery (+88% org.); CM&E +1% org. Glucophage VBP<sup>1</sup> impact compensated for by Endocrinology
- Lower absolute M&S vs. Q2 2020 with higher level of face-to-face activities amid progressing adaptation to pandemic situation
- Higher absolute R&D driven largely by ramp up of Evobrutinib and Xevinapant development activities; lower R&D as % of sales
- EBITDA pre and margin increasing with operating leverage, further supported by temporary Eli Lilly supply agreement in the U.S.

## Net sales bridge



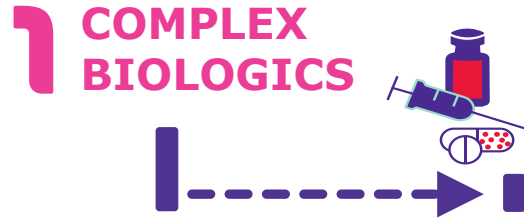
## EBITDA pre bridge





Life science

## Capitalizing on three key life science trends



### 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



### #1 eCommerce site in Life Science<sup>1</sup>

- **>90%** of  
Millipore products on  
eCommerce platform
- **x2** net sales growth  
of eCommerce vs.  
non-eCommerce<sup>2</sup>



Manufacturing/Distribution  
Nantong, Wuxi Single use

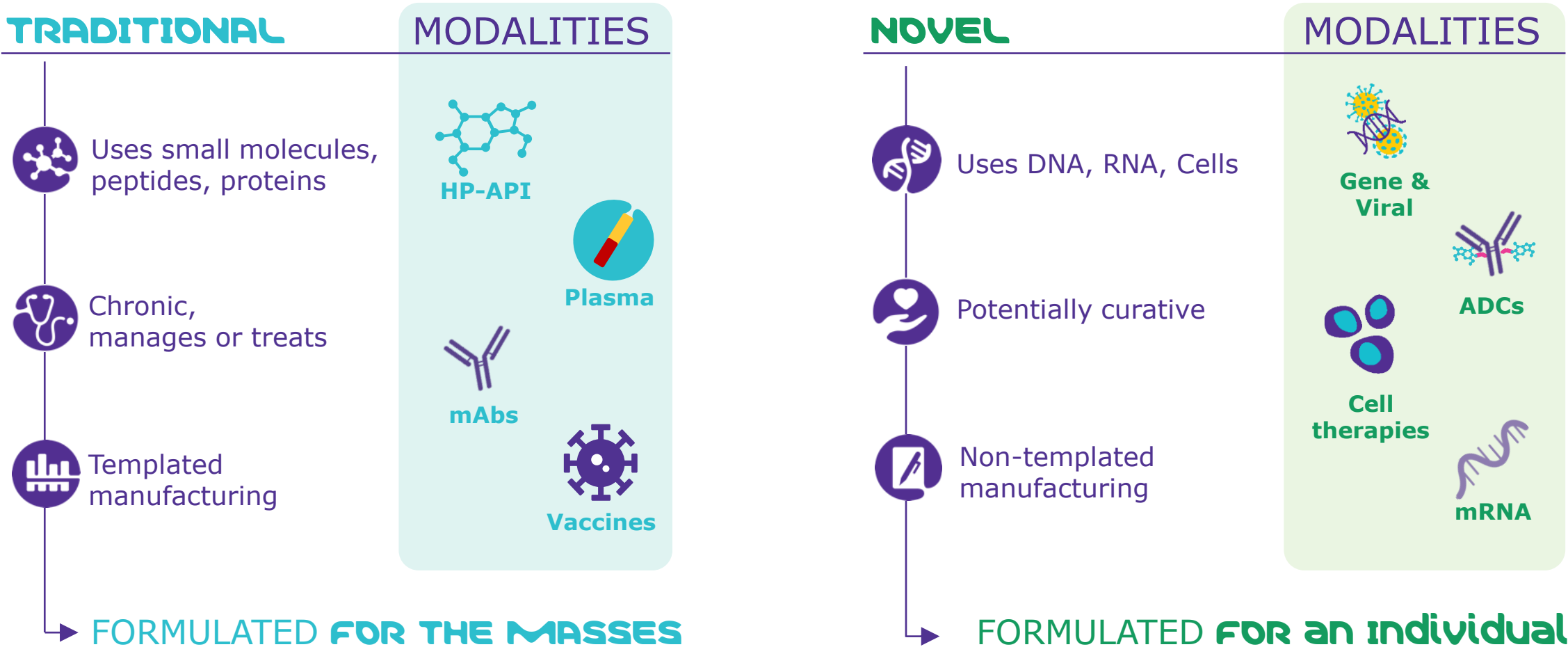
Commercial expansion  
Tier 2 cities

eCommerce partnership







Process Solutions: Therapies are evolving from treatments to cures

**Advancing traditional is critical as novel modalities develop**



## COVID demands align with our strengths but increase supply chain pressure

unit operations				
Cell culture media	●	●	●	●
Biopharm materials	●	●	●	●
Chromatography	●	●	●	●
Hardware	●	●	●	●
Single use	●	●	●	●
Sterile	●	●	●	●
Virus	●	●	●	●
Clarification	●	●	●	●
Tangential flow filtration	●	●	●	●

● = 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**

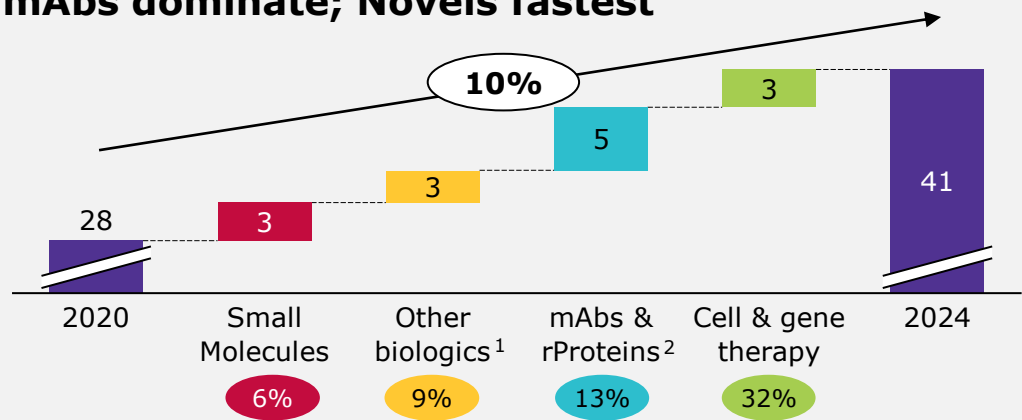
- Emerging manufacturing processes
- Lipids are critical



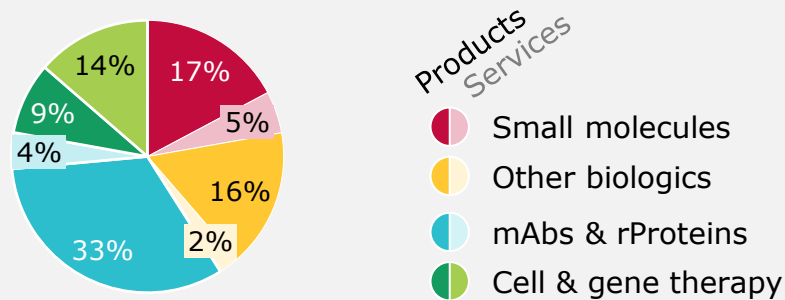
Opportunities in services to accelerate double-digit growth

Accessible Market (€ bn)

mAbs dominate; Novels fastest



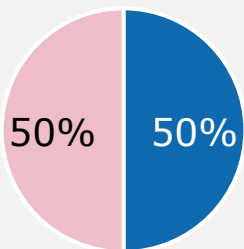
Service importance varies by modality



Origins of biologics pipeline

Emerging biotechs drive novels

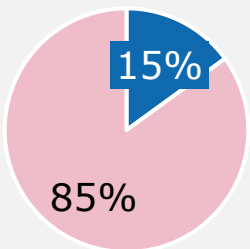
Traditional therapies



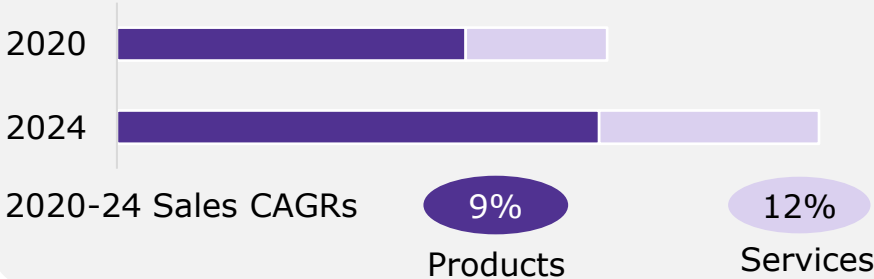
Company type

- Established
- Emerging

Novel therapies



Services see faster growth in coming years



Sources: Evaluate Pharma, internal market models, CSR sales data; <sup>1</sup> Other biologics include plasma, vaccines, insulin, microbial and non-mAb biosimilars; <sup>2</sup> mAbs include ADCs here; Additional acronym: rProteins = recombinant proteins



## Process Solutions: Strategic direction

**Innovate and invest today to continue above market growth in the future**



# Process Solutions

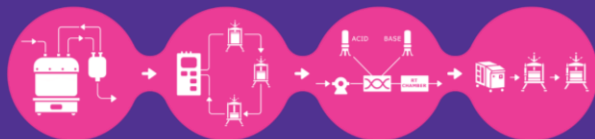
## Next-generation bioprocessing on the cards

Today's  
process & portfolio



Tomorrow's  
process

MAb process intensification 2017 - 2020+



continuous processing >2025

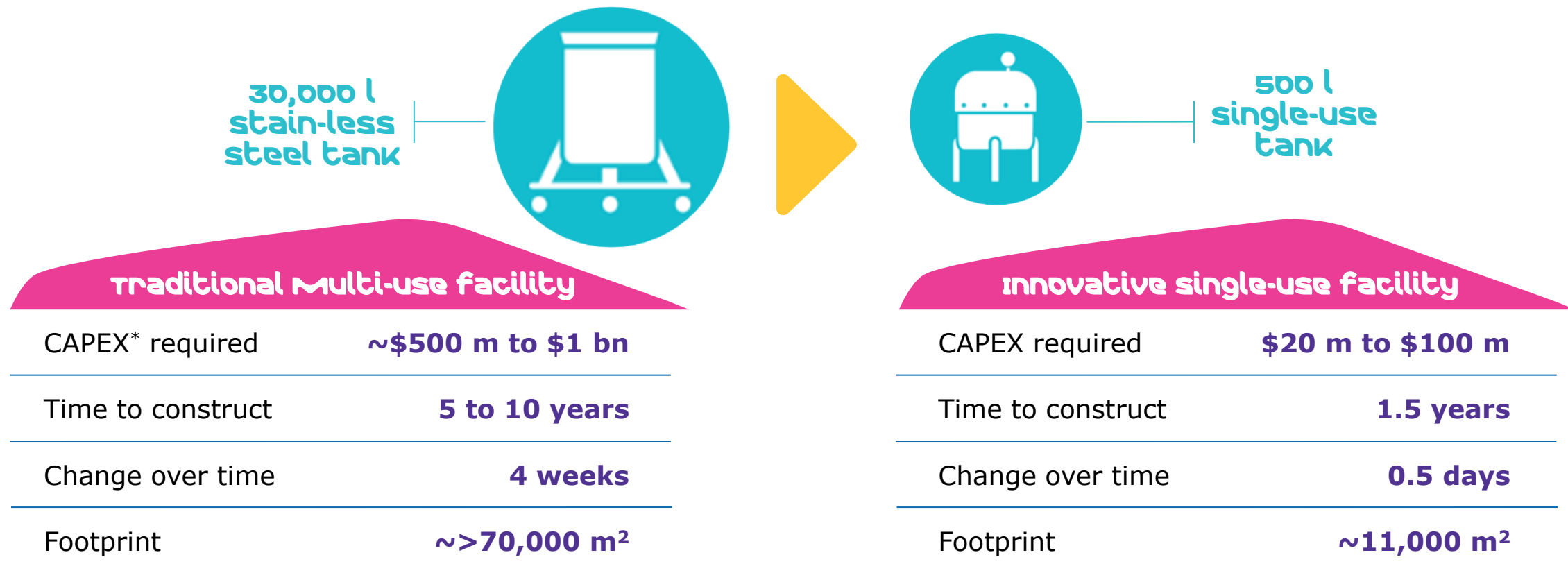


### Continuous bioprocessing will ...

- 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

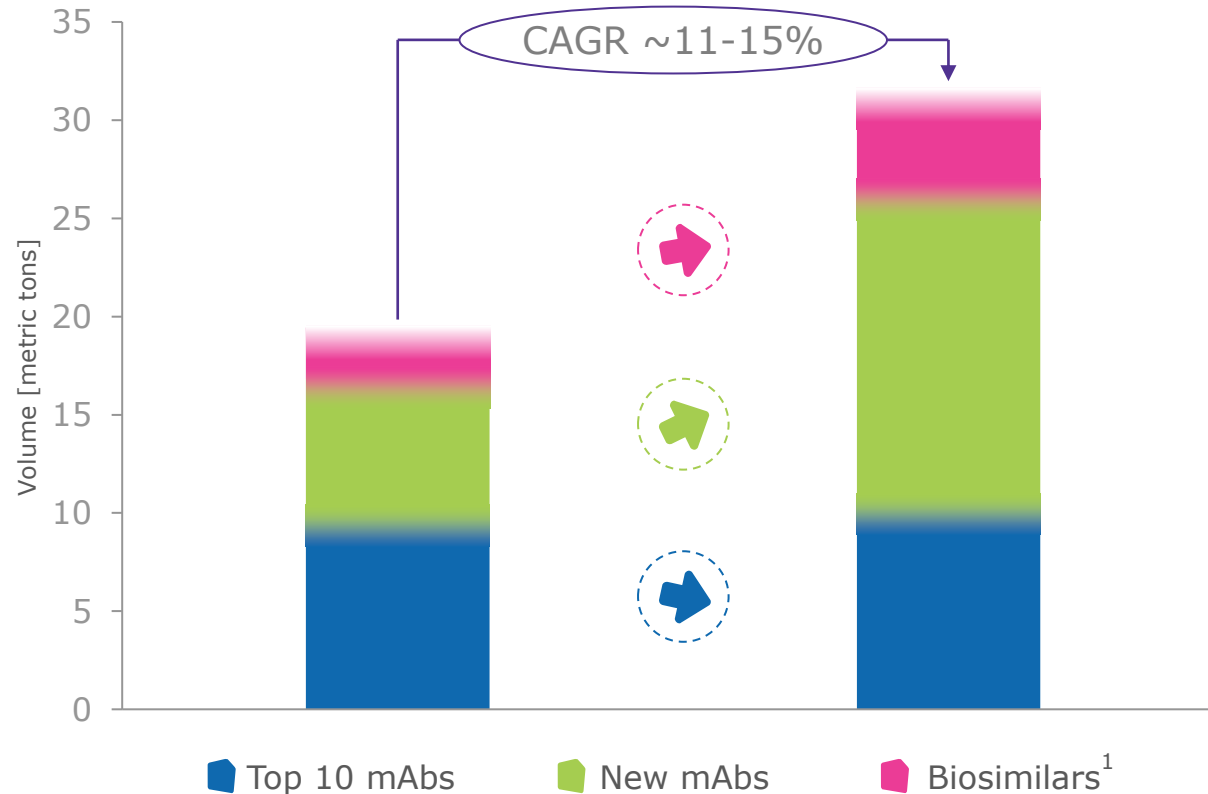


**Strong demand for single-use technologies and Process Solutions' broad offering was and will remain a key source of growth for Life Science**



# mAbs market democratization will drive diversification, change & variability

## mAb volume projections 2020 to 2024



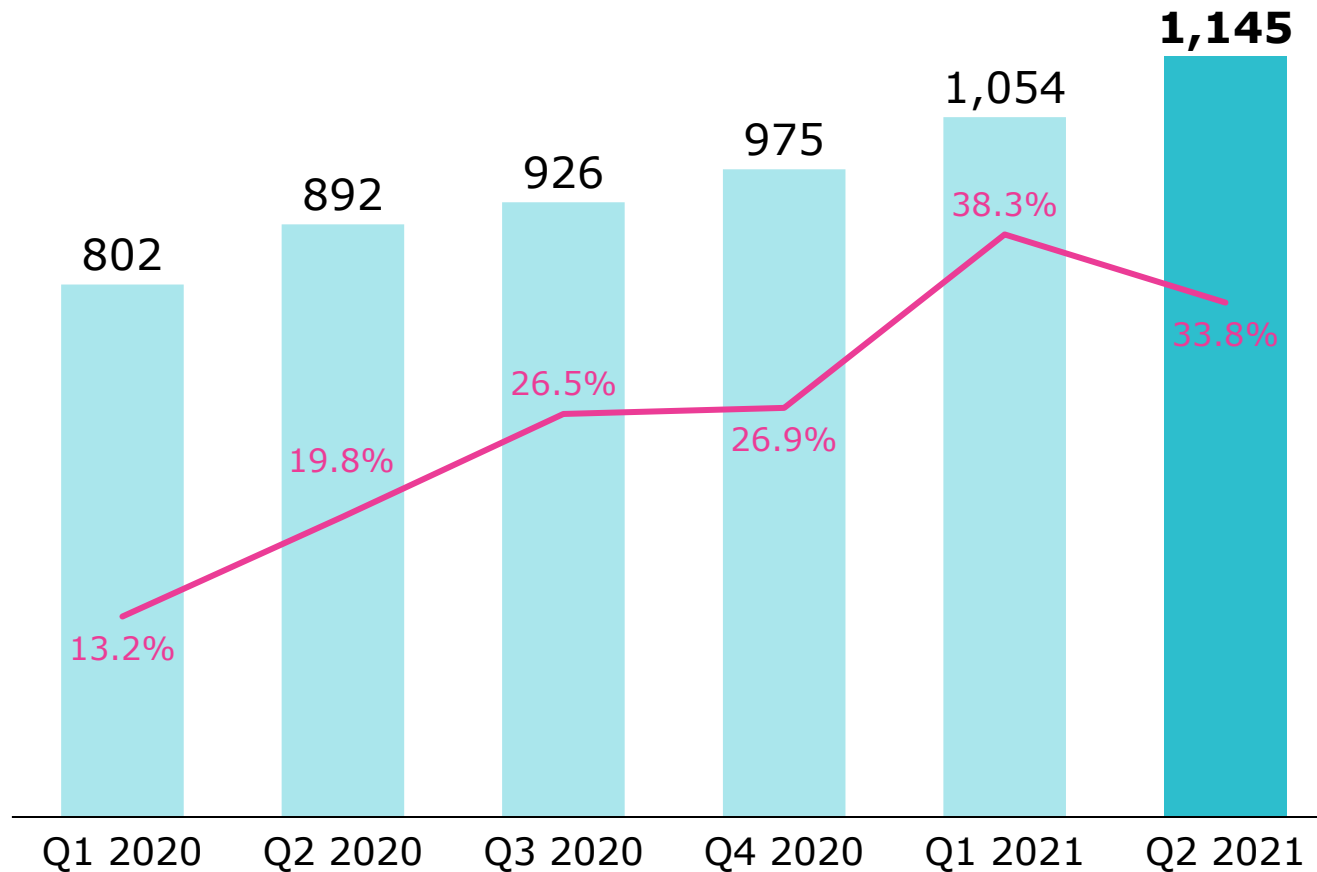
<sup>1</sup>Biosimilars scaling factor = 2.8 based off internal estimates and McKinsey analysis;  
Source: company estimate based on industry forecasts, EvaluatePharma; mAbs = Monoclonal antibodies

## Market development

- Overall mAbs market will grow ~11-15% CAGR
- Top 10 originator mAbs represent ~ 50% of market volume today and will decline to ~30% in 2024
- Biosimilars will gain share

## BIG 3 - Process Solutions: Continued strong double-digit growth, moderating as expected against rising comps

Sales development [€m] - org. growth [%]

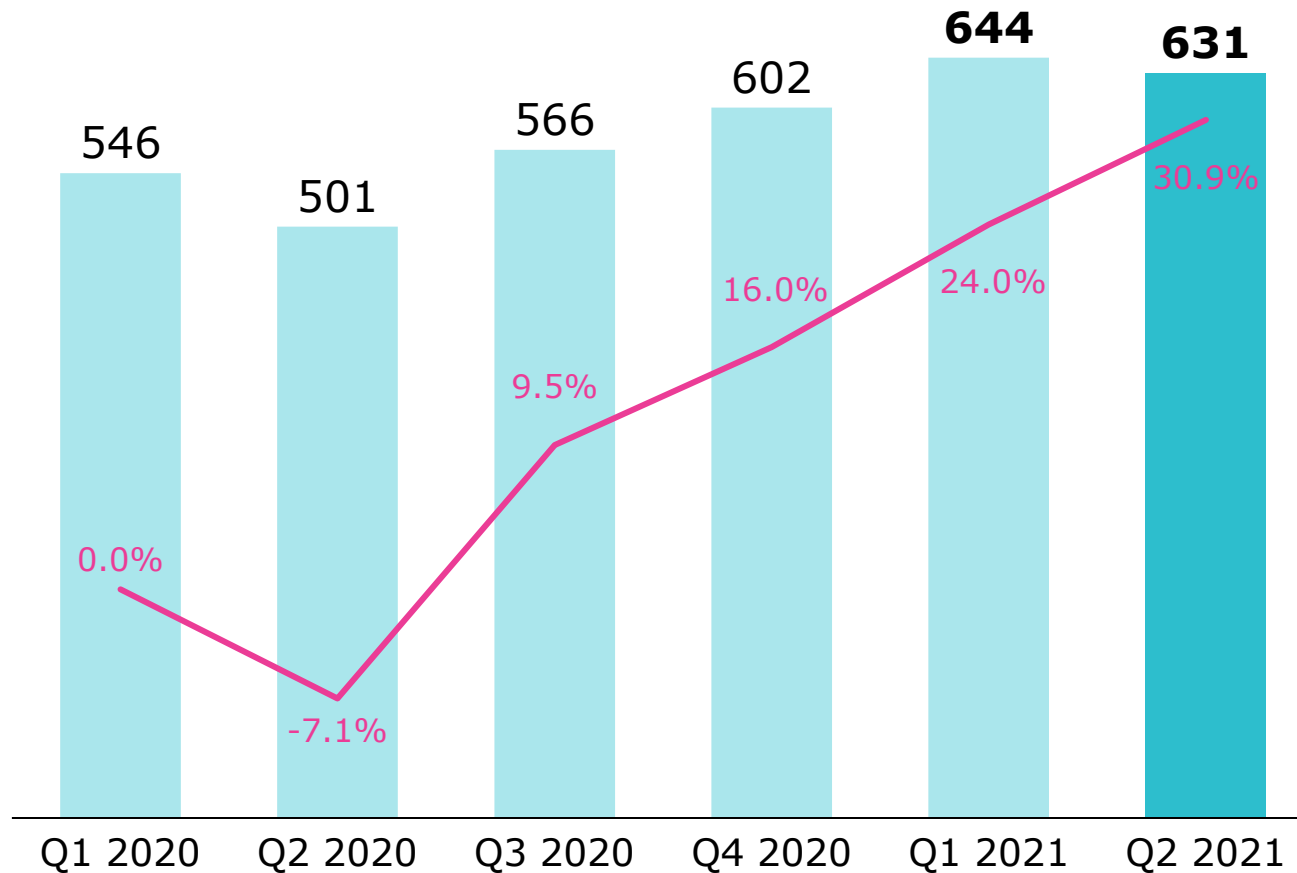


- Continued **double-digit growth in the core business** paired with **rising COVID-19 contributions** (mainly vaccine related)
- **BioP as main growth driver**, formulation growing fastest, services also strong
- **Growth starting to moderate** as expected **amid rising comps** (Q2 2020 with initial COVID-19 contributions)
- Sequentially higher sales as output increases on the back of **ongoing productivity gains and successful capacity ramp-up**
- **Order intake growth remains above 60%**, reflecting strong demand



# Research Solutions: Record organic growth amid ongoing business recovery and soft comps

Sales development [€m] - org. growth [%]

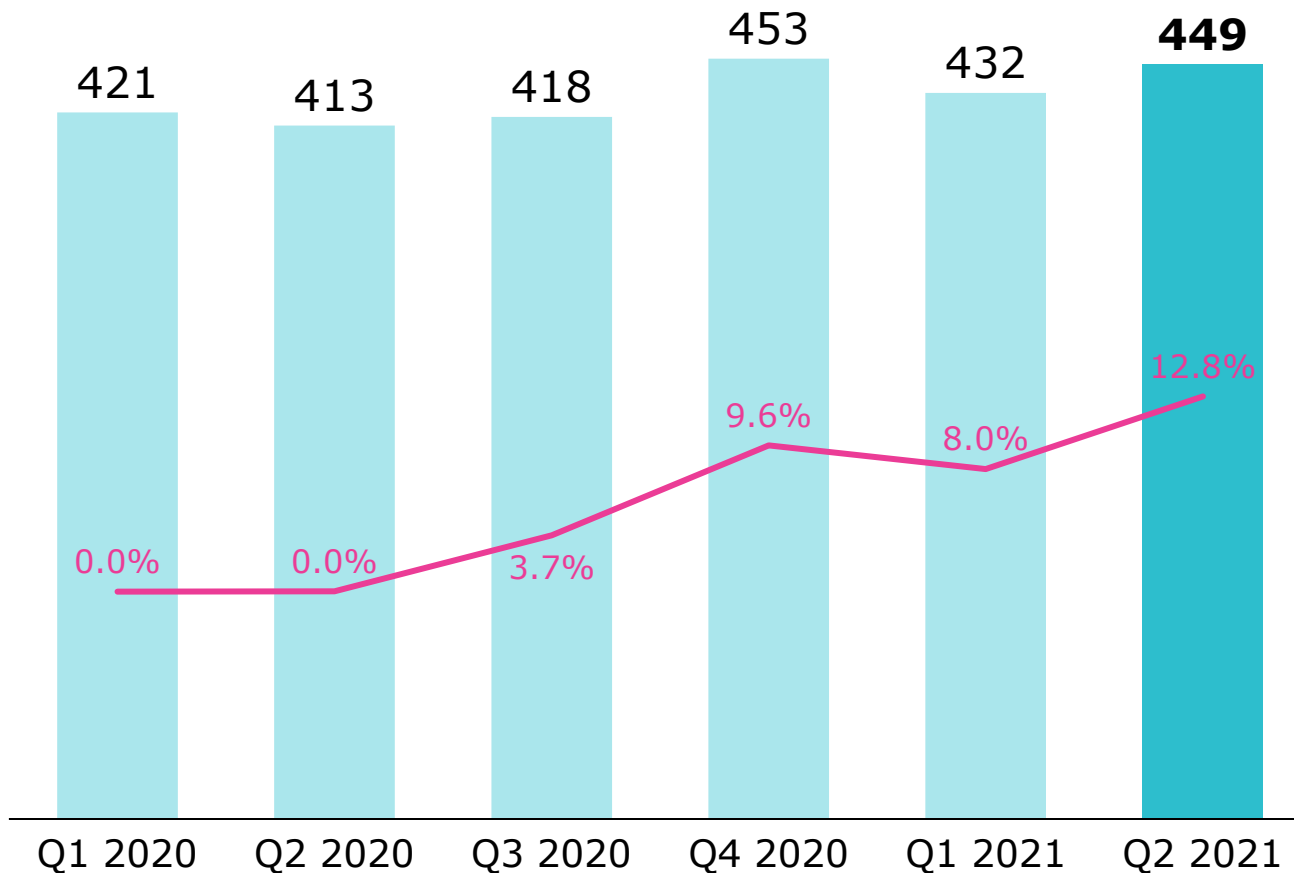


- Strong **double-digit growth, accelerating further** on soft comps (Q2-20 with biggest impact from lockdowns)
- Ongoing **core business recovery** and catch-up amid **rising lab activity**
- Diagnostics related **COVID-19 tailwinds continue albeit slowing** as expected
- **North America as fastest growing region**, followed by Europe and APAC (given difference in comps / phasing of lockdowns last year)
- **Strong rebound in academia** and healthy growth in pharma



# Applied Solutions: Growth accelerating as recovery is gaining traction

Sales development [€m] - org. growth [%]



- **Growth accelerating to double-digits** as recovery continues amid still easy comps (H1-20 with flat growth due to lockdowns)
- **Core business as main driver** with broad-based performance across business lines
- **COVID-19-related sales are negligible**
- **North America as fastest growing region**, followed by Europe and APAC (given difference in comps / phasing of lockdowns last year)
- **Strong rebound in Academia** and ongoing recovery in Industrial





# Life Science Q2: Strong core business and COVID-19 demand fuel record growth, mainly driven by Process and Research Solutions

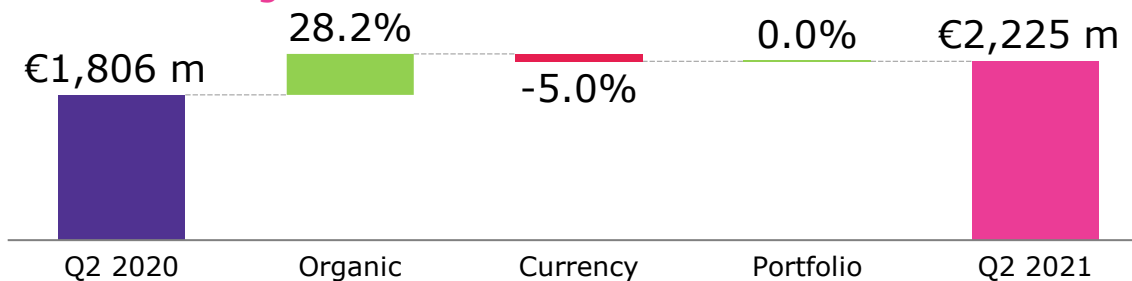
## Life Science P&L

[€m]	IFRS		Pre	
	Q2 2020	Q2 2021	Q2 2020	Q2 2021
Net sales	1,806	2,225	1,806	<b>2,225</b>
M&S*	-488	-505	-488	<b>-505</b>
Admin	-100	-92	-88	<b>-84</b>
R&D	-75	-87	-75	<b>-87</b>
EBIT	386	644	370	<b>638</b>
EBITDA	584	835	-	-
EBITDA pre	569	829	569	<b>829</b>
(in % of net sales)	31.5%	37.3%	31.5%	<b>37.3%</b>

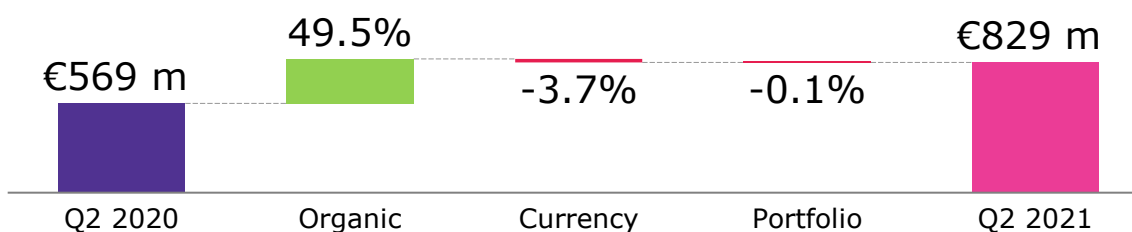
## Comments

- Process Solutions: grows +34% organically, supported primarily by bioprocessing demand for COVID-19 projects; comparable base now starts including COVID-19 business
- Research Solutions: grows +31% organically against Q2 2020 COVID-19 dip, driven by recovery in base business and COVID-19 opportunities, mainly in diagnostics and pharma
- Applied Solutions: grows (+13% org.) against softest quarter of 2020
- Declining M&S in % of sales from 27% to 23% due to strong top line leverage, slightly higher in absolute terms
- Higher R&D in absolute terms with continued focused investments in high growth & emerging segments
- Business performance, operational leverage & favorable mix continue to drive strong EBITDA pre and margin expansion

## Net sales bridge



## EBITDA pre bridge

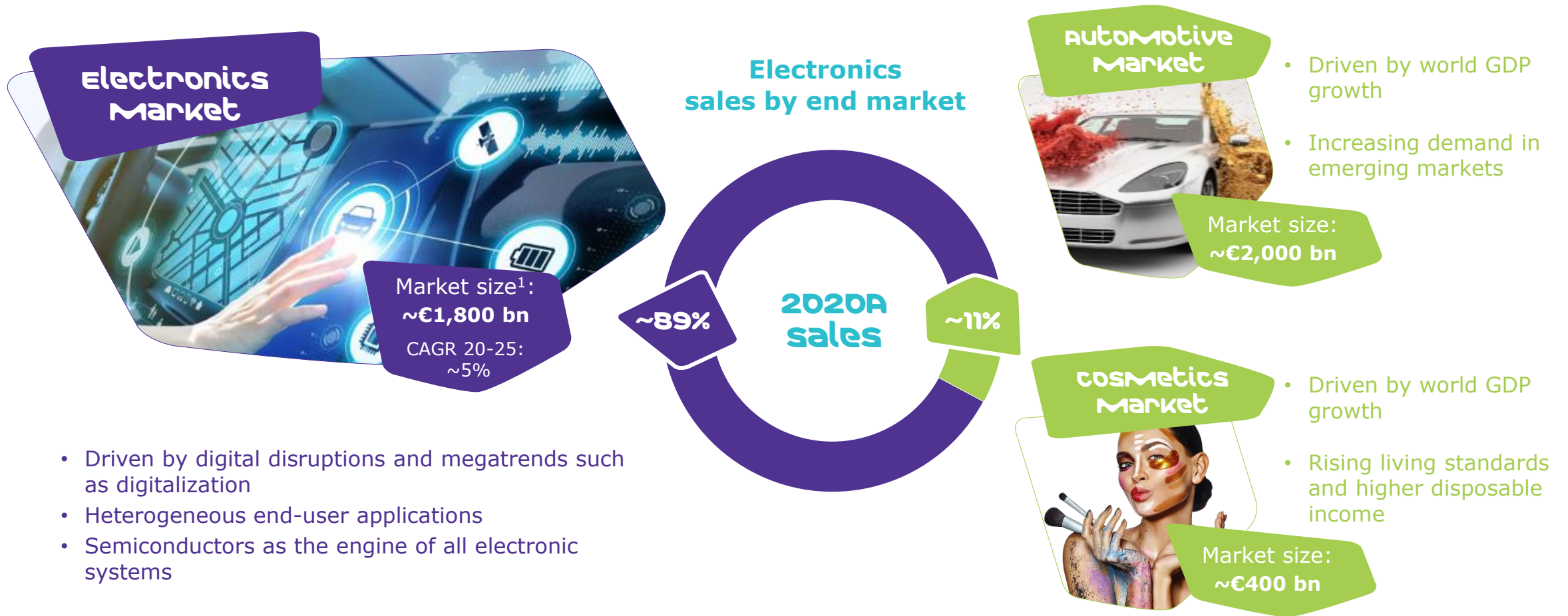




electronics

# Electronics

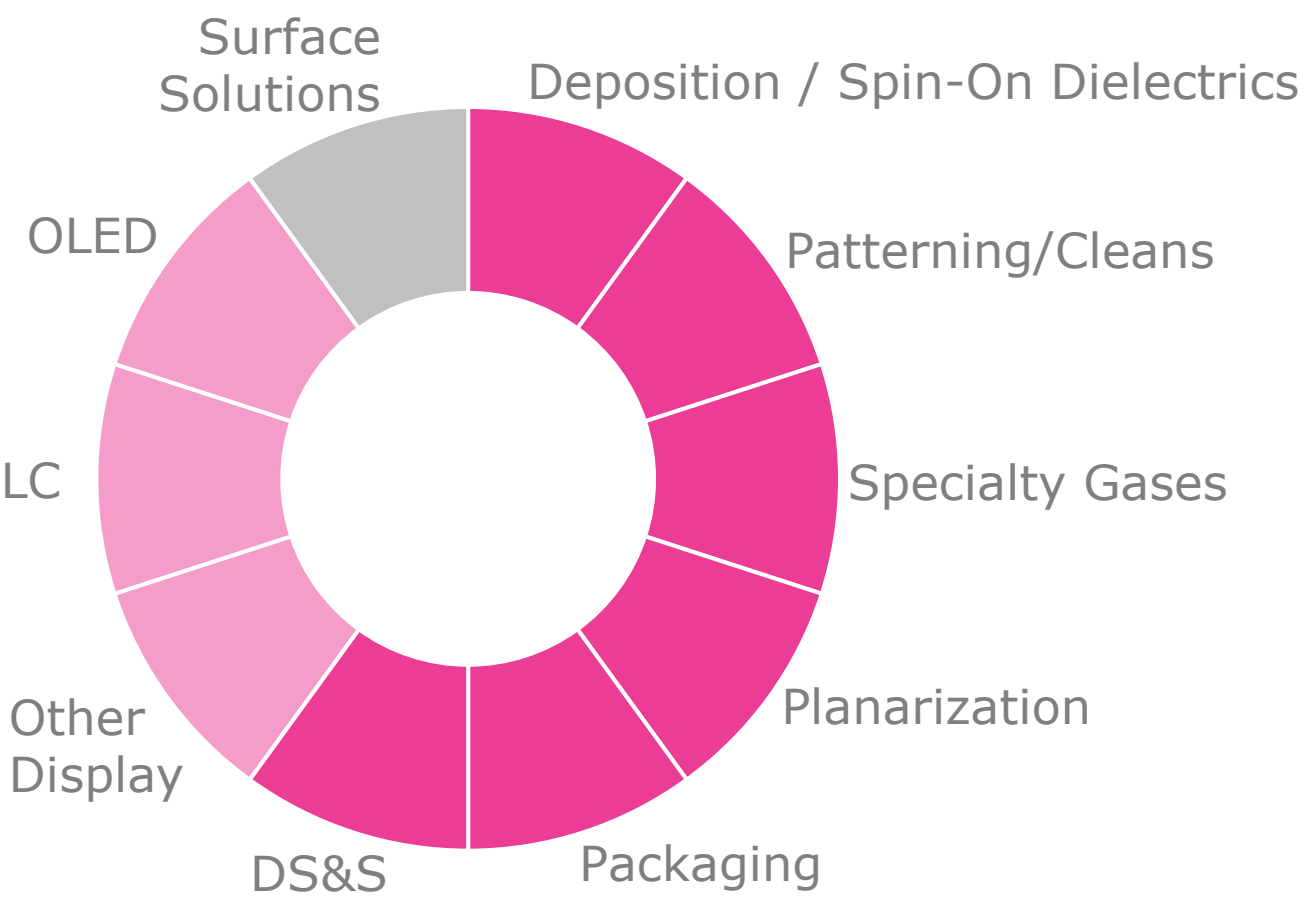
## Targets attractive markets – especially in the electronics space



<sup>1</sup>Prismark 2021

Electronics

# Expected mid-term portfolio split



Mid-term the Electronics portfolio will consist of **~10 equally sized businesses**

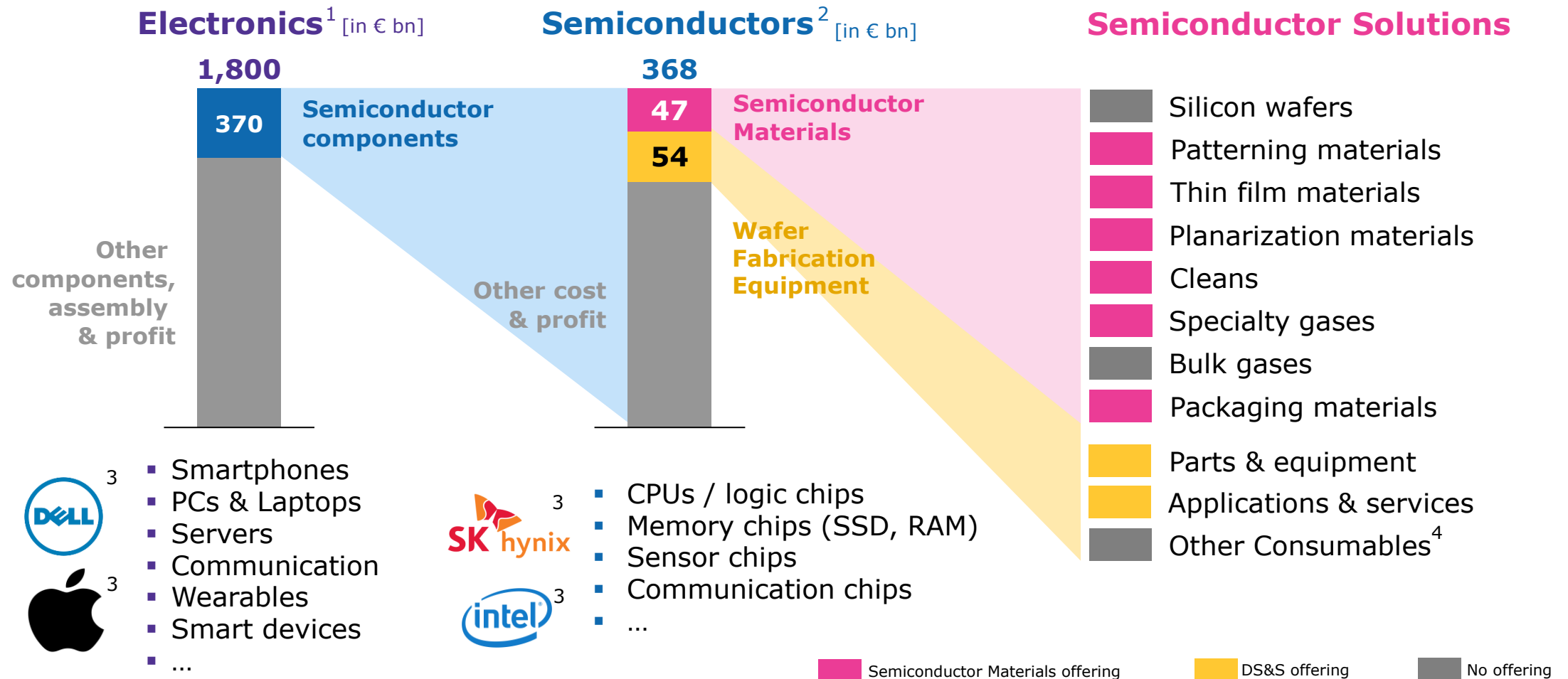
**>60%** of them **serving chip makers**

INDICATIVE Chart

Semiconductor Solutions     Display Solutions     Surface Solutions



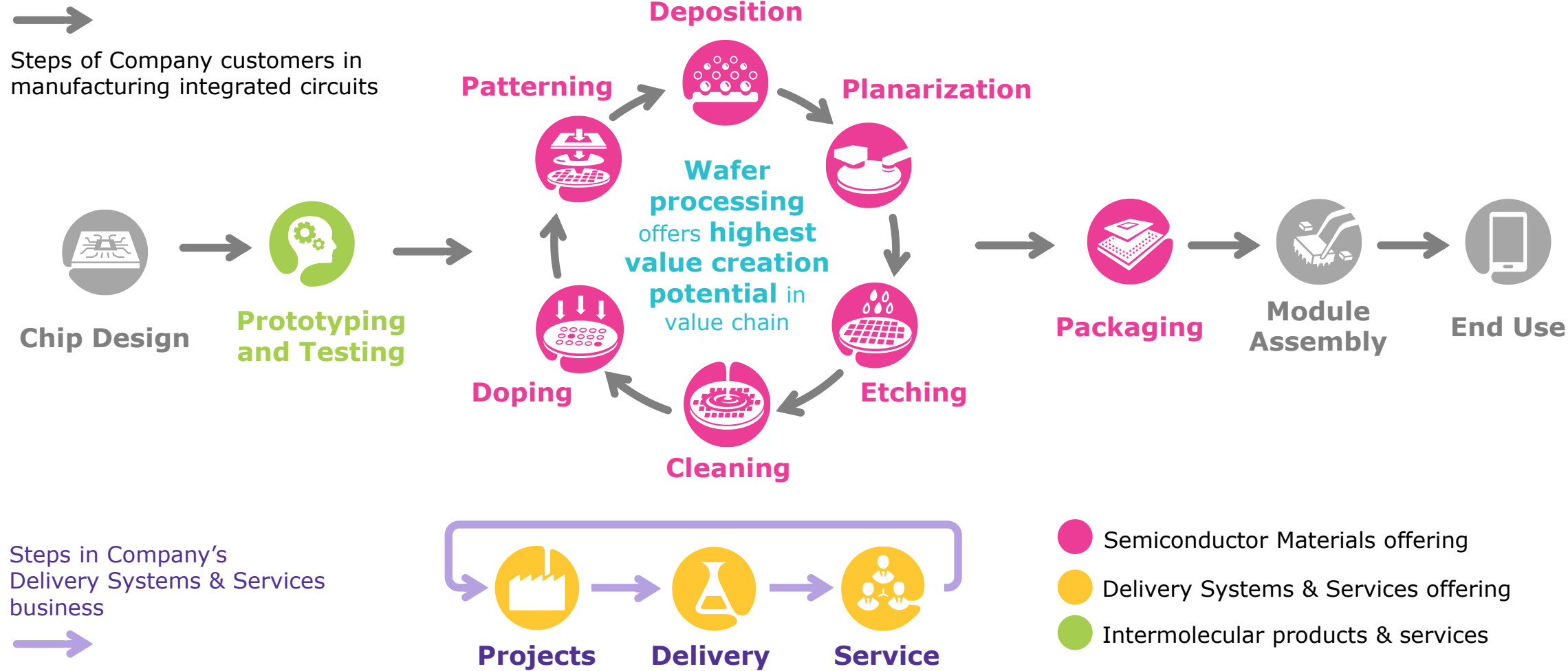
# Semiconductor Solutions – **integrated materials player, well positioned to serve the need of customers in semiconductor fabrication**



Illustrative Industry P&Ls based on Sources: <sup>1</sup>Prismark 2021, <sup>2</sup>Prismark 2021 & WSTS/SIA & SEMI Q1 2020; <sup>3</sup>Representative player in the industry, non-exclusive list, not based on any underlying criteria;

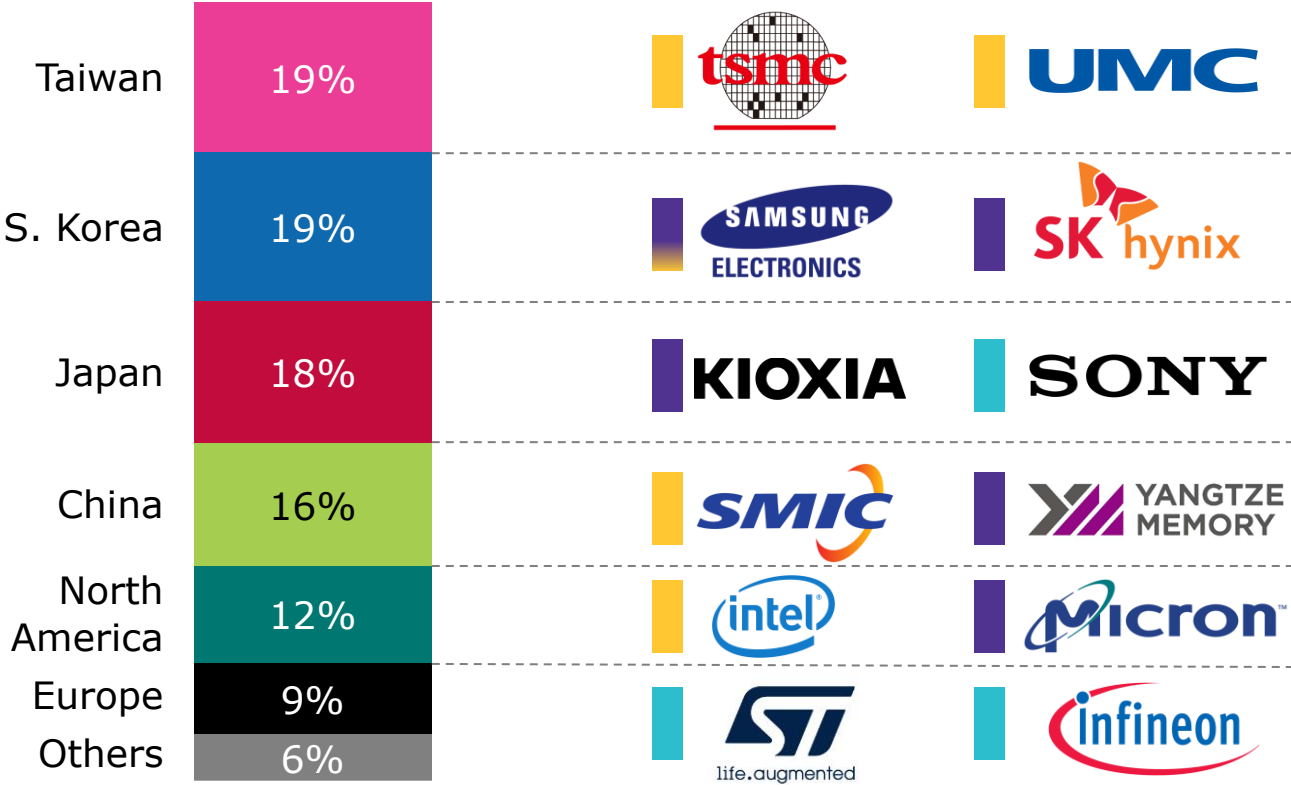
<sup>4</sup>e.g. Filters, Pads, etc.; CPU = Central Processing Unit; RAM = Random Access Memory; SSD = Solid State Disk; CMOS = Complementary metal-oxide semiconductor

# 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<sup>1</sup>      Selected customers per region<sup>2</sup>



Semiconductor Solutions has **OVER 100 customers** supplying all top 10 chip makers and virtually all of the top 100<sup>3</sup>

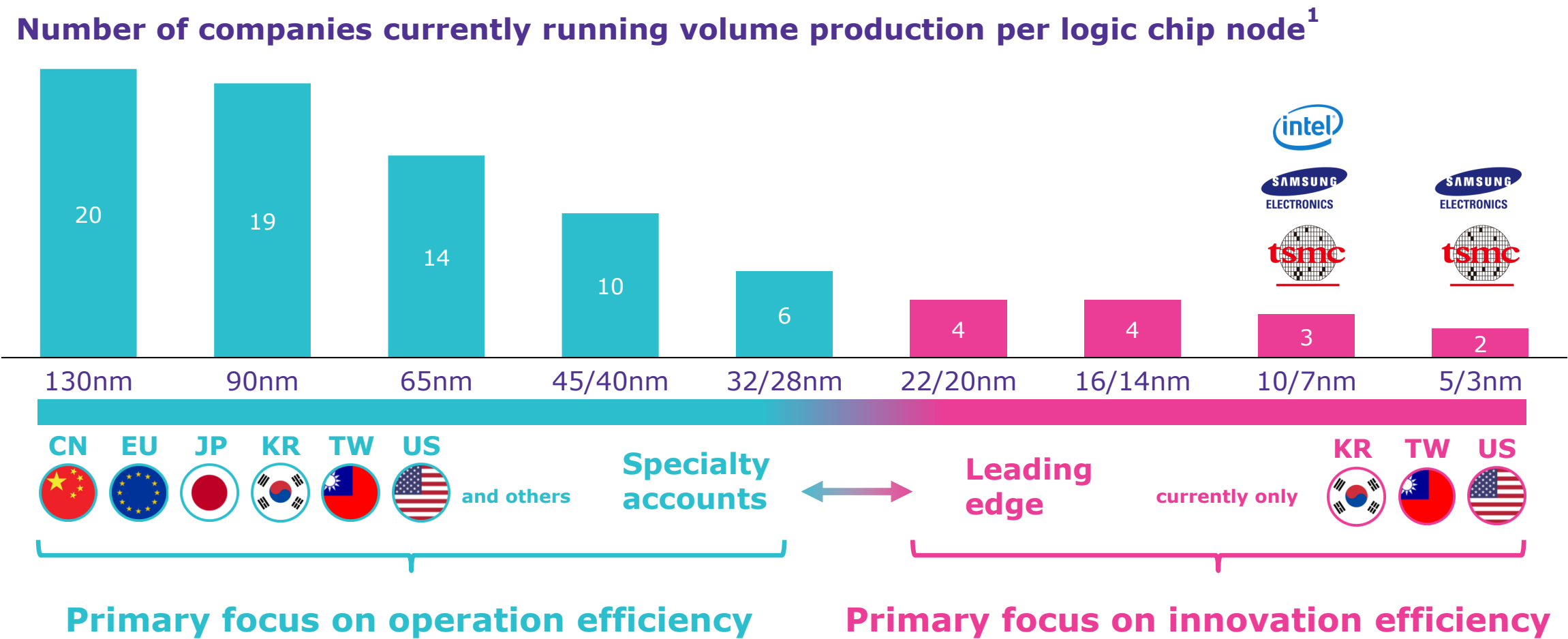
- Focus on logic chips
- Focus on memory chips
- Focus on other chips

<sup>1</sup>SEMI World Fab Forecast Q3 2020 - Dec 2019 capacity, <sup>2</sup>Representative, non-exclusive list, not based on any underlying criteria

<sup>3</sup>Based on H1 2020 Sales



# Only 3 companies are currently running volume production $\leq 10\text{nm}$ These companies have the largest market shares across all nodes



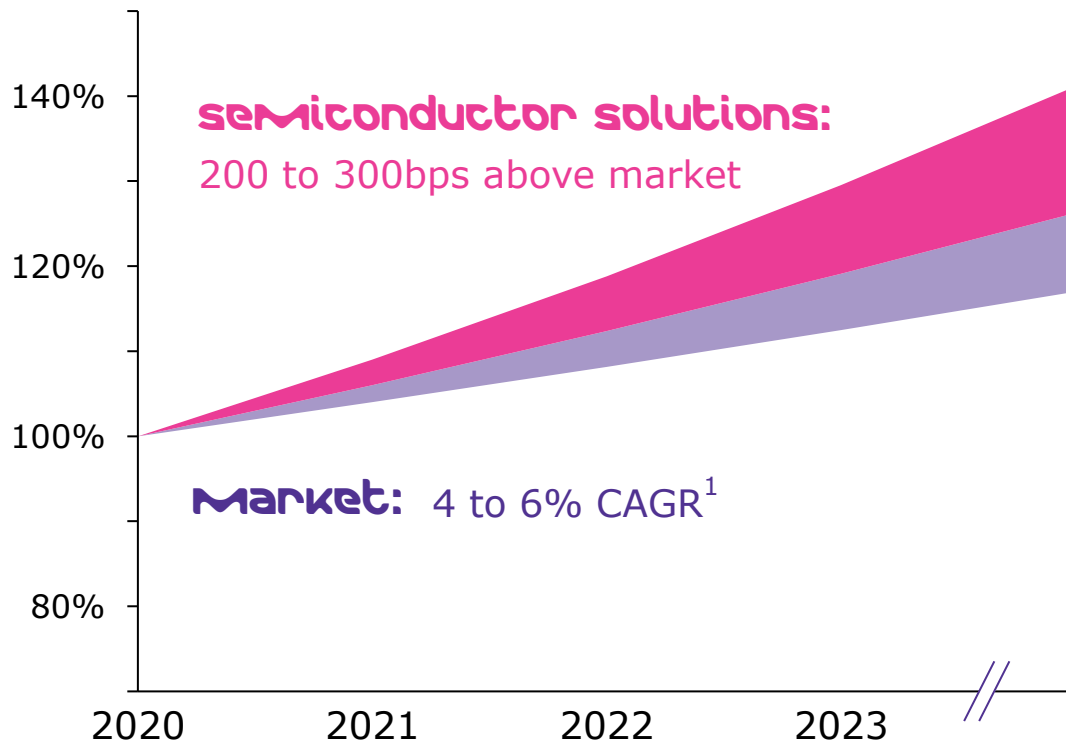


# Semiconductor Materials

## Set to outgrow highly attractive semiconductor materials market

### Semiconductor Solutions sales guidance vs. market

[Indexed 2020 = 100%]



<sup>1</sup>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**

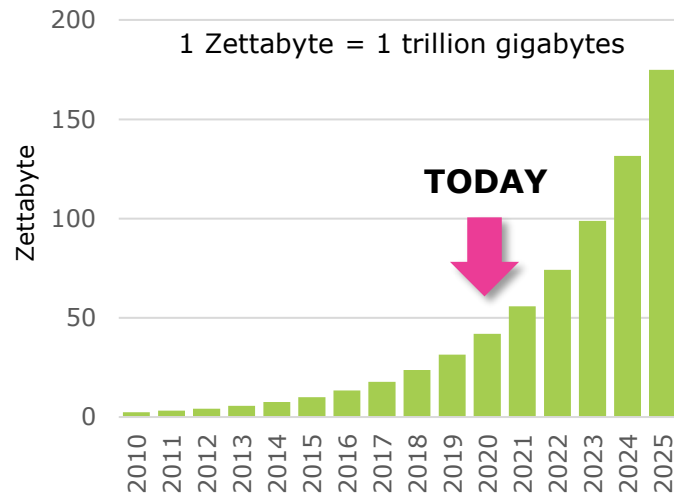
# Technology trends inevitably drive exponential data growth... ...more chips needed to generate, transfer, process & store data

**Data created worldwide**  
is growing +30% annually

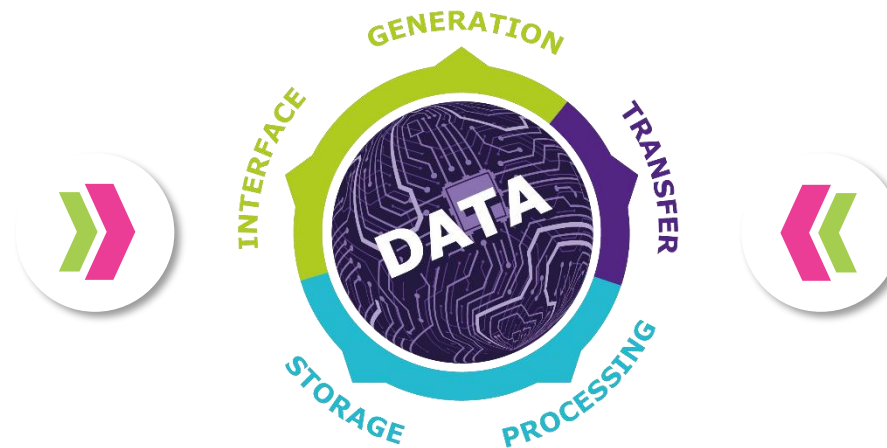
**All segments of data application**  
are affected by global data growth

**Technology trends** strongly impact  
relevance of data application segments

Size of global data sphere



Source: IDC DataAge 2025 Whitepaper



Technology market growth - examples

**5G Technology<sup>1</sup>**  
>122% CAGR

**Artificial Intelligence<sup>2</sup>**  
>33% CAGR

**IoT Sensors<sup>3</sup>**  
>24% CAGR

**Data Center Services<sup>4</sup>**  
>13% CAGR

**Autonomous Driving<sup>5</sup>**  
>18% CAGR

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

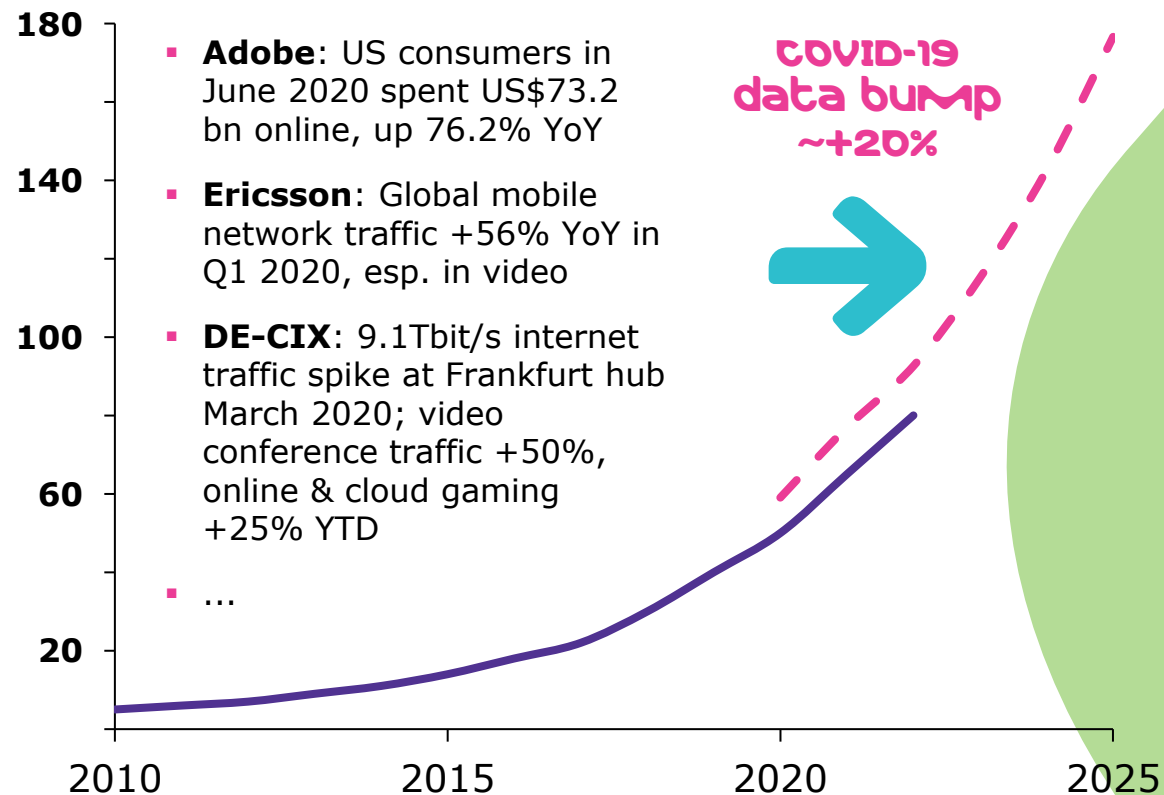
1) [alliedmarketresearch.com](https://www.alliedmarketresearch.com), Prismark 2020, CAGR 2021-2026; 2) [fortunebusinessinsights.com](https://www.fortunebusinessinsights.com), [post-gazette.com](https://www.post-gazette.com), CAGR 2018-2026; 3) [mordorintelligence.com](https://www.mordorintelligence.com), [computerweekly.com](https://www.computerweekly.com), CAGR 2020-2025;

4) [mordorintelligence.com](https://www.mordorintelligence.com), Prismark 2020; CAGR 2020-2025; 5G = 5<sup>th</sup>-generation cellular wireless; IoT = Internet of Things 5) [mordorintelligence.com](https://www.mordorintelligence.com), autonomous car market value CAGR 2020-2025

# Semiconductor Solutions

**COVID-19** has vaulted the “digital transformation” by ~5 years<sup>1</sup>

## Expected COVID-19 impact on global datasphere<sup>2</sup> [zetabytes]



<sup>1</sup>Source: McKinsey May 2020 “The COVID-19 recovery will be digital: A plan for the first 90 days”;

<sup>2</sup>Source: Seagate, IDC April 2020, Merck KGaA, Darmstadt, Germany

## COVID-19 impact on data growth expected to be positive

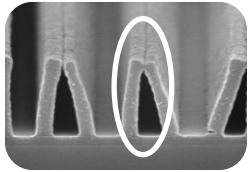
- 1
  - Work-from-home/stay-at-home economy
  - Significant increase in video conferences, online shopping, online gaming, streaming
- 2
  - Change in consumers’ and enterprises’ digital behavior expected to be long-lasting
- 3
  - Need for more, faster & more reliable data processing, storage and bandwidth
  - Acceleration of semiconductor demand

**semiconductor solutions  
stands ready to support  
increased demand**

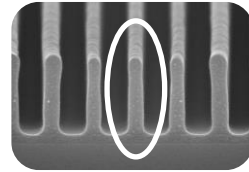
# Electronics

## Expanding the limits of how small you can go

### Pattern collapse

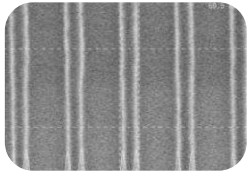


### AZ® rinse materials



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

### Lithography limitation

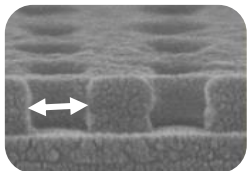


### Directed self-assembly (DSA)

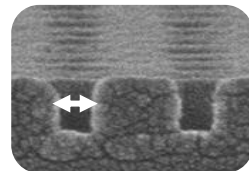


Block copolymer can generate small lines or contact holes by self-assembly. This allows miniaturization without expensive new equipment.

### Wide features



### AZ® shrink materials



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



**Company delivers highly innovative solutions for complex customer problems**

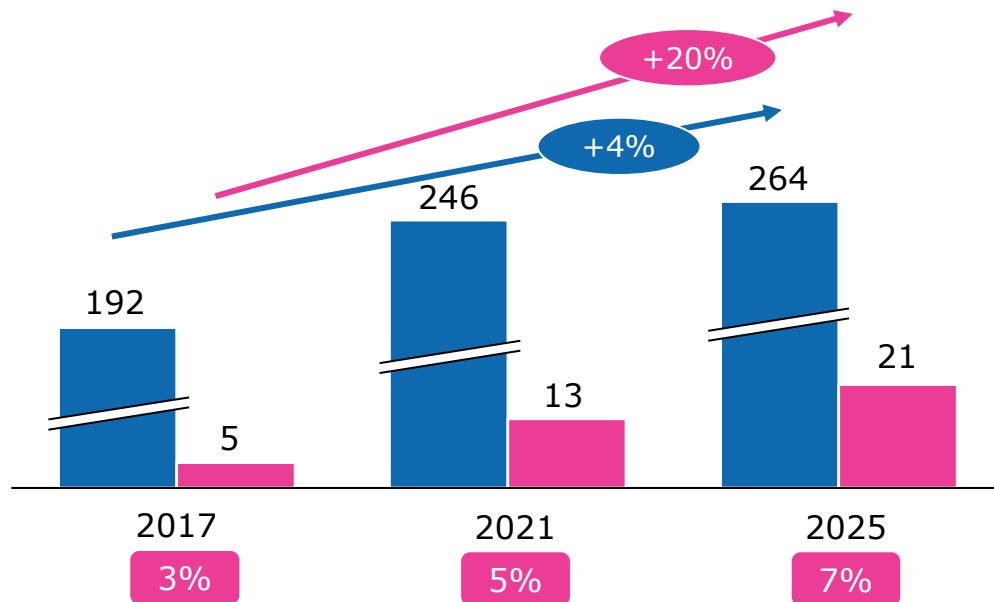


## Electronics

# Display Solutions - OLED material market to exceed LC material market **already in 2021**

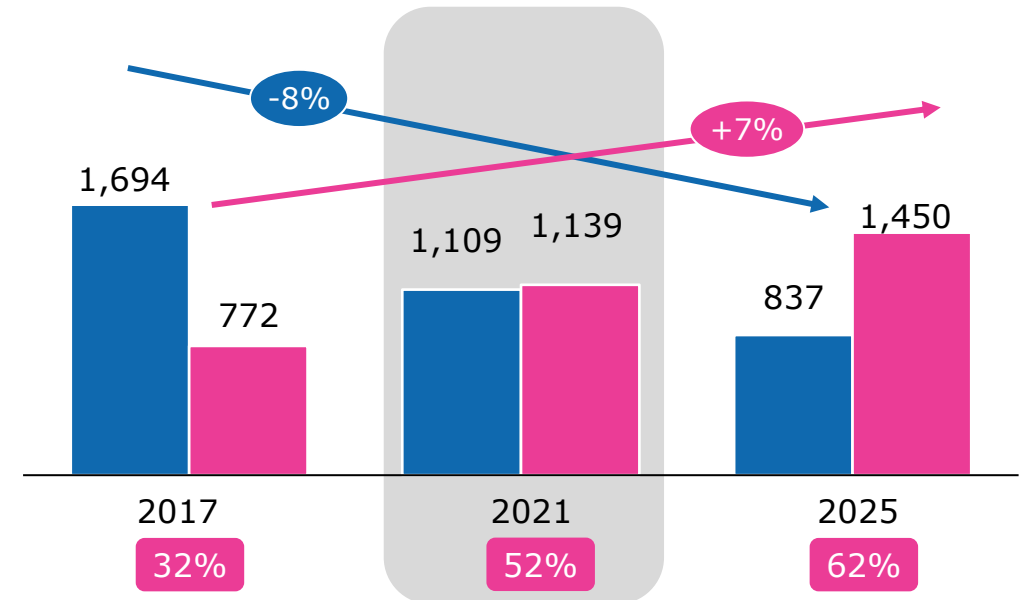
x% OLED shipment area / addressable material market [in % of total]    Liquid Crystals    OLED

**Display shipment area<sup>1</sup>**  
[km<sup>2</sup>]



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

**Addressable material market<sup>2</sup>**  
[€m]



- **Material value** per OLED display **higher** than in LCD
- **OLED material market to exceed LC material market by 2021**, but market split between **many more players**

<sup>1</sup>Omdia; <sup>2</sup>Internal Business Intelligence; Acronyms: LCD = Liquid-Crystal Display, OLED = Organic Light Emitting



# Electronics Q2: Strong performance in Semi, recovery in Surface, and stabilizing Display Solutions drive double-digit organic sales growth

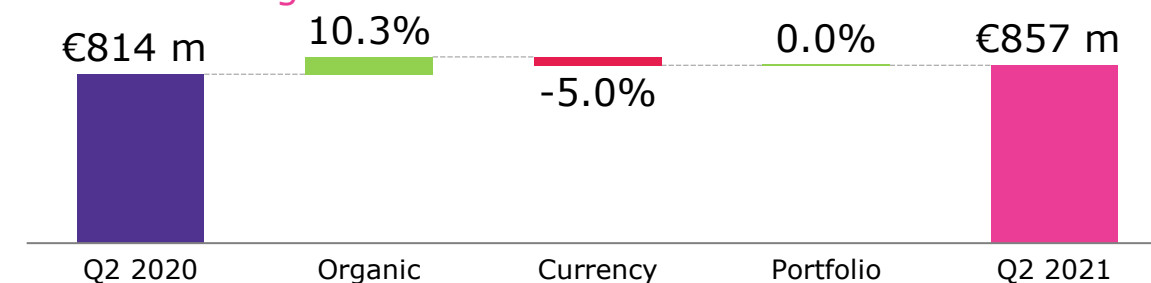
## Electronics P&L

[€m]	IFRS		Pre	
	Q2 2020	Q2 2021	Q2 2020	Q2 2021
Net sales	814	857	814	<b>857</b>
M&S*	-134	-137	-131	<b>-136</b>
Admin	-44	-30	-36	<b>-28</b>
R&D	-68	-67	-69	<b>-66</b>
EBIT	-30	118	101	<b>129</b>
EBITDA	219	252	-	<b>-</b>
EBITDA pre	238	258	238	<b>258</b>
(in % of net sales)	29.3%	30.1%	29.3%	<b>30.1%</b>

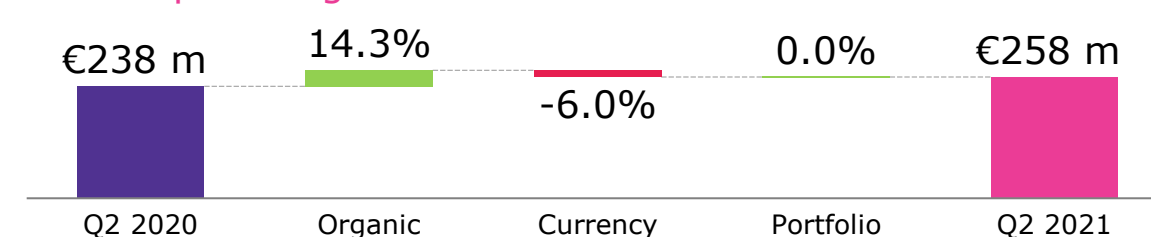
## Comments

- Semiconductor Solutions: record quarter in terms of sales; 12% organic growth across all businesses with Semi Materials growing even faster than strong DS&S
- Display Solutions: down -1% organically as LC decline was nearly fully offset by growth in remaining portfolio primarily strong OLED
- Surface Solutions: delivers 41% organic growth over pandemic-impacted Q2 2020; visible recovery across all end markets
- M&S up 4%, largely driven by higher logistic costs, while admin and R&D are declining
- All P&L lines continue to reflect diligent cost management amid Bright Future transformation and Versum integration synergies
- EBITDA pre (+14% org.) continues to exceed sales growth, but burdened by -6% FX headwinds

## Net sales bridge



## EBITDA pre bridge



## CONSTANTIN FEST



Head of Investor Relations  
+49 6151 72-5271  
[constantin.fest@emdgroup.com](mailto:constantin.fest@emdgroup.com)

## SVENJA BUNDSCHUH



Assistant Investor Relations  
+49 6151 72-3744  
[svenja.bundschuh@emdgroup.com](mailto:svenja.bundschuh@emdgroup.com)

## SARA HOFMANN



Assistant Investor Relations  
+49 6151 72-3321  
[sara.hofmann@emdgroup.com](mailto:sara.hofmann@emdgroup.com)

## ILJA DOERING



Institutional Investors /  
Analysts  
+49 6151 72-24164  
[ilja.doering@emdgroup.com](mailto:ilja.doering@emdgroup.com)

## GUNNAR ROMER



Institutional Investors /  
Analysts  
+49 6151 72-2584  
[gunnar.romer@emdgroup.com](mailto:gunnar.romer@emdgroup.com)

## AMELIE SCHRADER

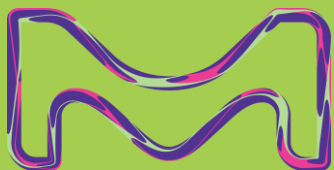


Institutional Investors /  
Analysts  
+49 6151 72-22076  
[amelie.schrader@emdgroup.com](mailto:amelie.schrader@emdgroup.com)

## EVA STERZEL



ESG / Institutional & Retail  
Investors / AGM  
+49 6151 72-5355  
[eva.sterzel@emdgroup.com](mailto:eva.sterzel@emdgroup.com)



**EMAIL:** [investor.relations@emdgroup.com](mailto:investor.relations@emdgroup.com)

**WEB:** [www.emdgroup.com/investors](http://www.emdgroup.com/investors)

**FAX:** +49 6151 72-913321