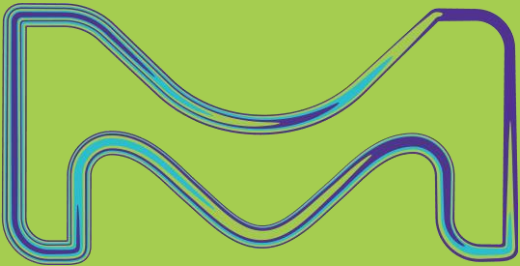


Merck KGaA, Darmstadt, Germany

Q2 21 Roadshow

Marcus Kuhnert, CFO

August 2021



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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

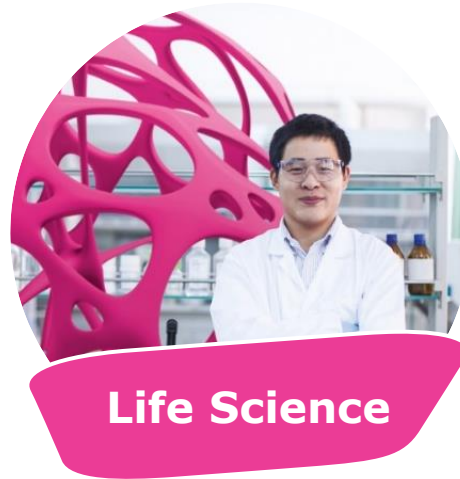
Group

Three high-tech businesses competing in attractive markets



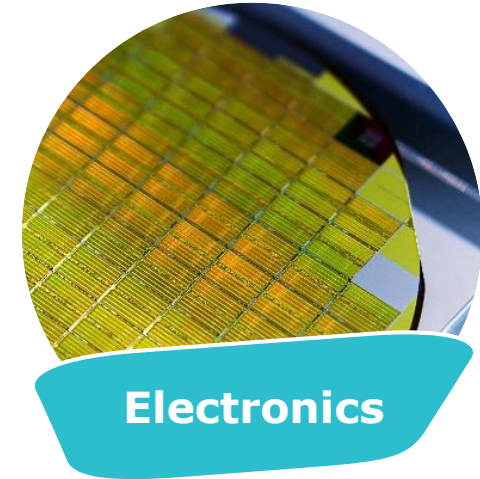
Leading in specialty
pharma markets

- 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

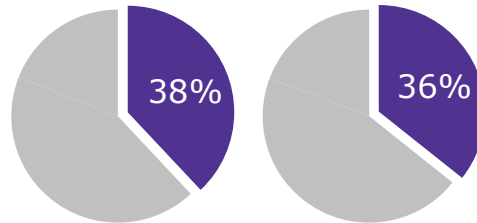
Group today – three strong pillars as basis for profitable growth

FY 2020 contribution to¹

Sales

EBITDA pre

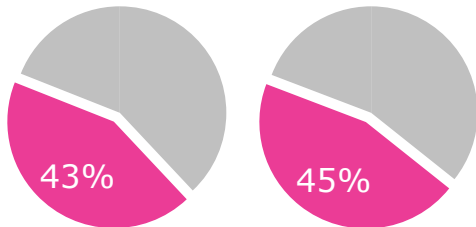
1. Healthcare



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

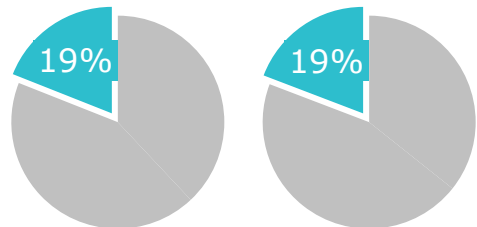
2. Life Science



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

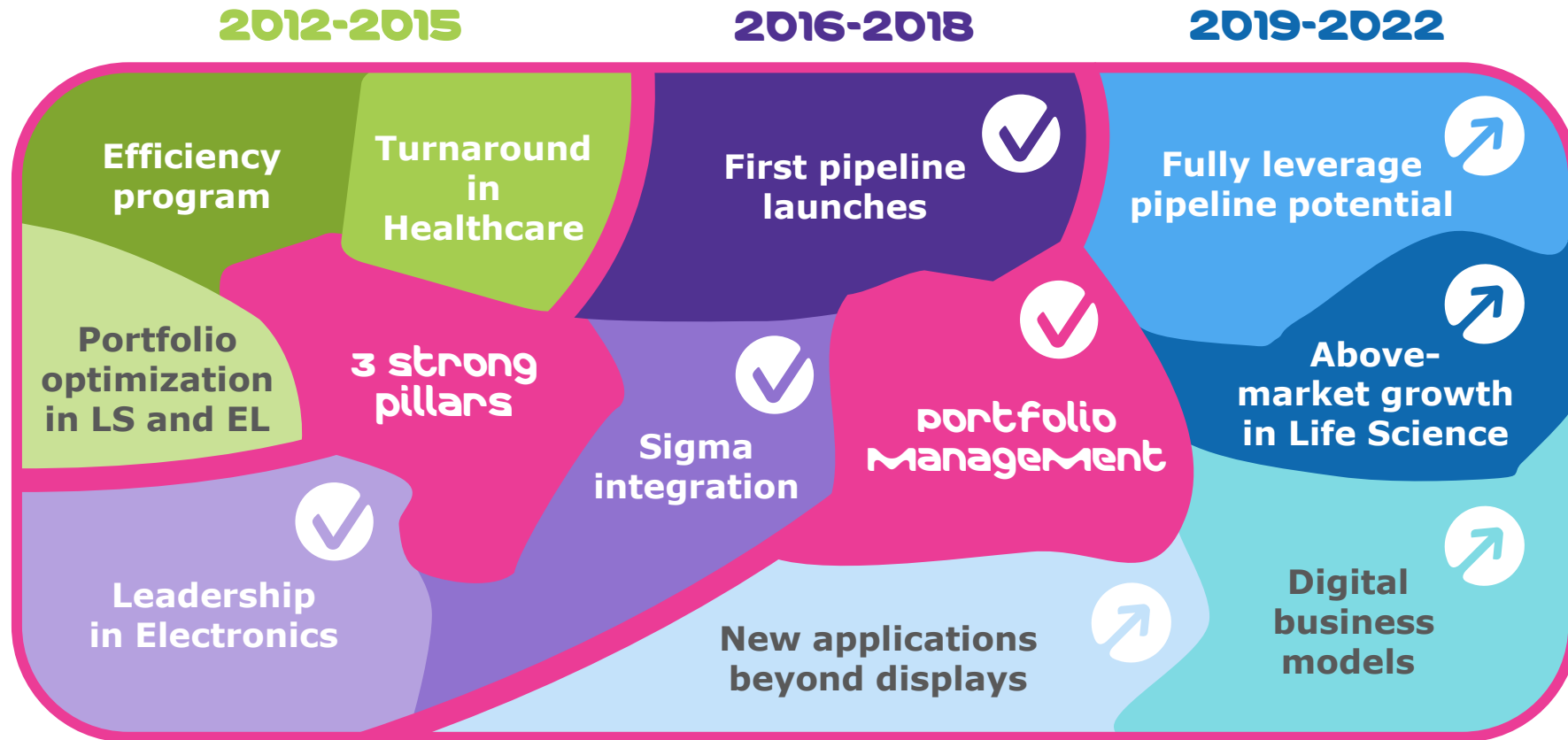
- **Growing semiconductor share** as key driver for acceleration
- **More resilient growth** through rising diversification
- **Strict cost discipline** in maturing parts of the portfolio

¹EBITDA 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



Group

The 2016 vision – a strategic agenda until 2022

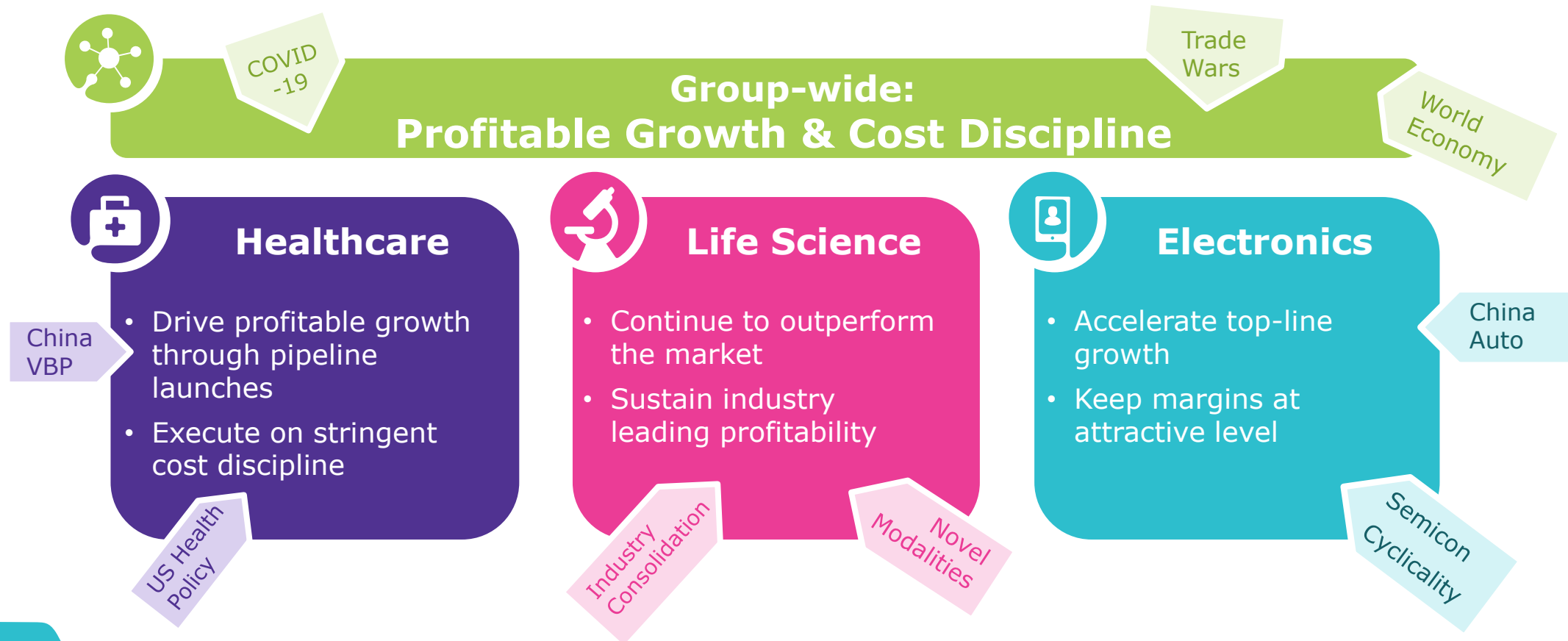


Executing on the growth and expansion phase of the 2016-22 strategic agenda

✓ = delivered; ↗ = well on track

Group

2021 and beyond – poised for growth in a challenging environment



Staying on course in a potentially volatile environment

Acronym: VBP = volume based procurement

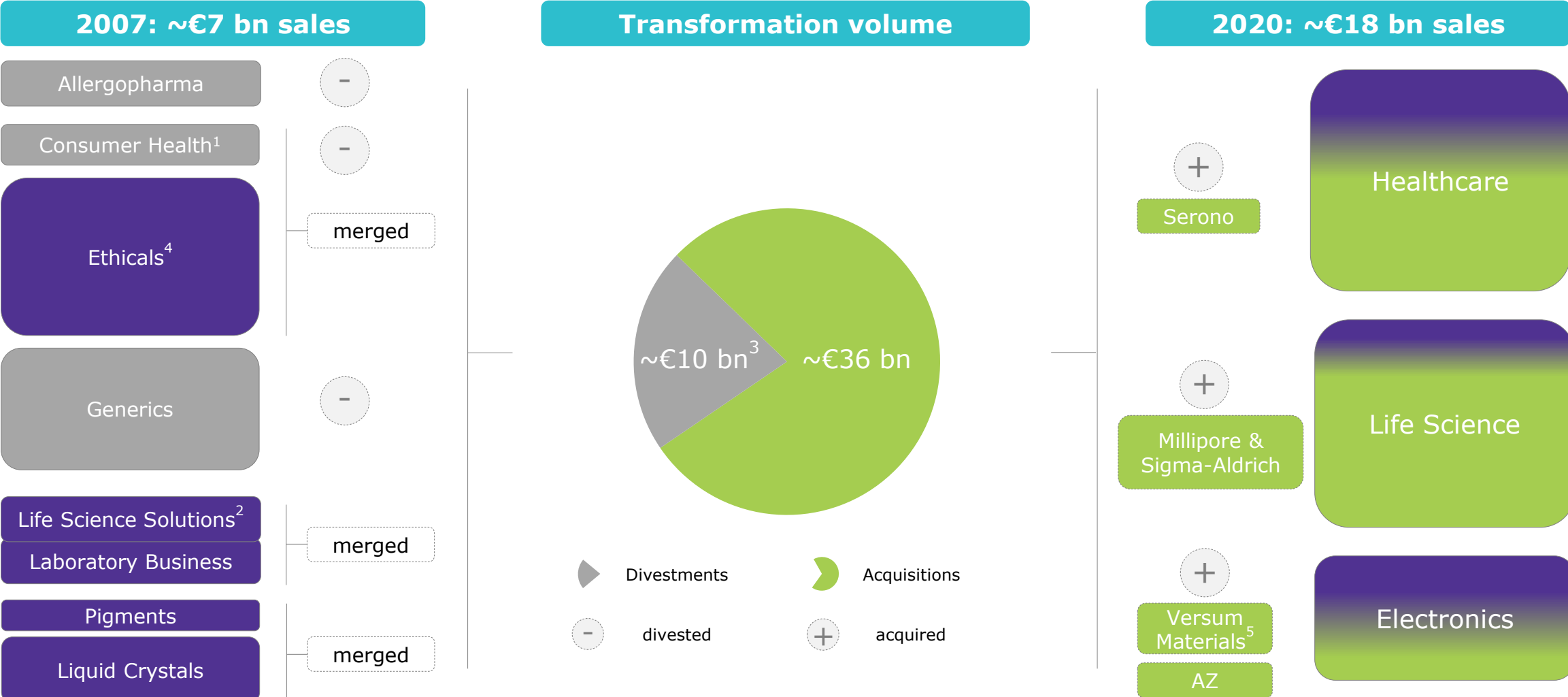


transforming
the company

02

Group

We have added scale and strengthened the attractiveness of our portfolio



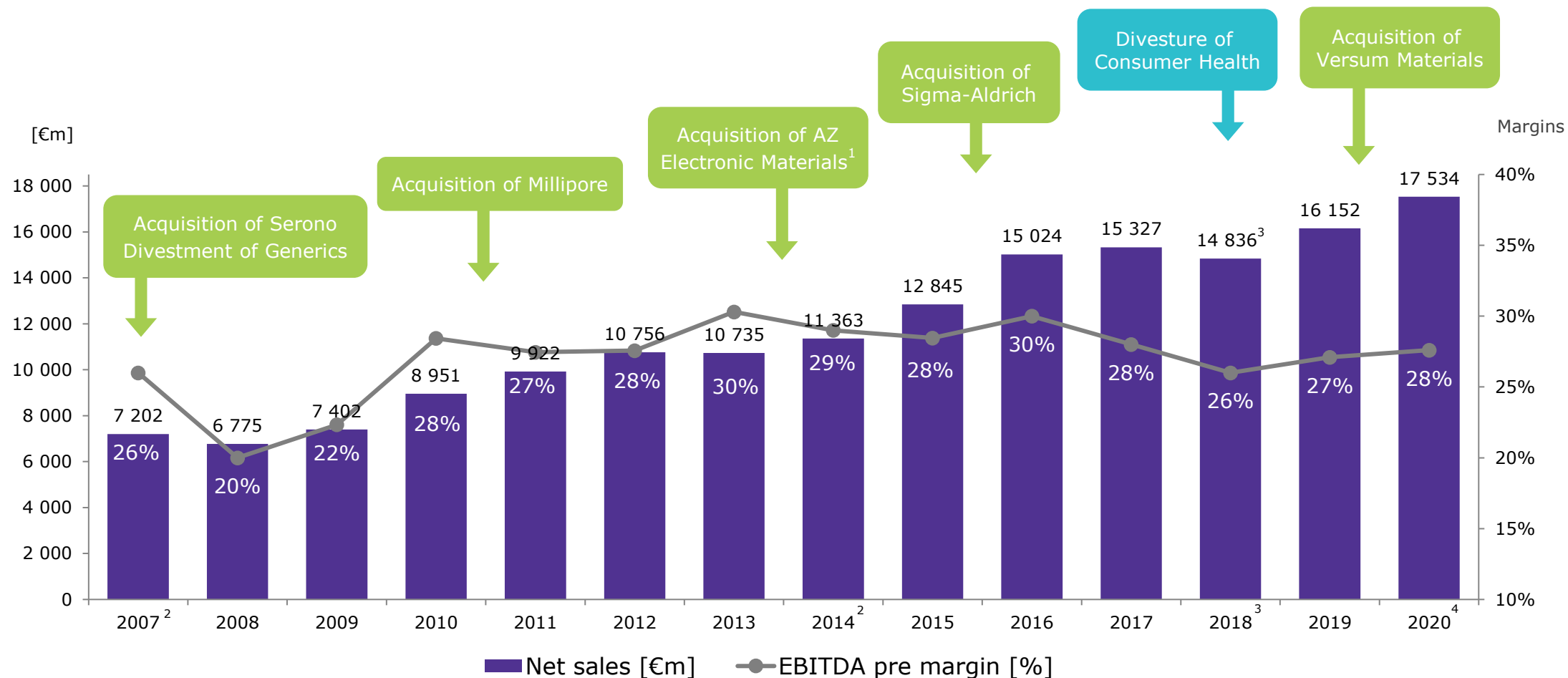
10

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

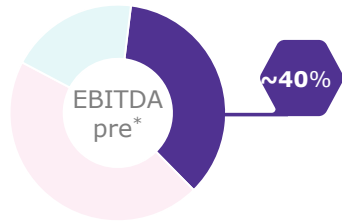


Group

Clear set of priority goals



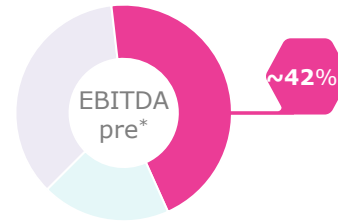
Healthcare



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



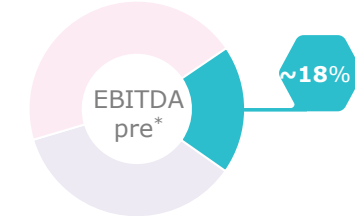
Life science



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



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 economy¹



**Global
GDP**

~3% to 4%



End markets¹



Global pharma industry
~4% to 5%



Global life science industry
~5% to 6%



Global electronics industry
~4%



~4% to 5%

Focus market areas¹



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



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



Semi materials: ~4% to 6%



6%-plus

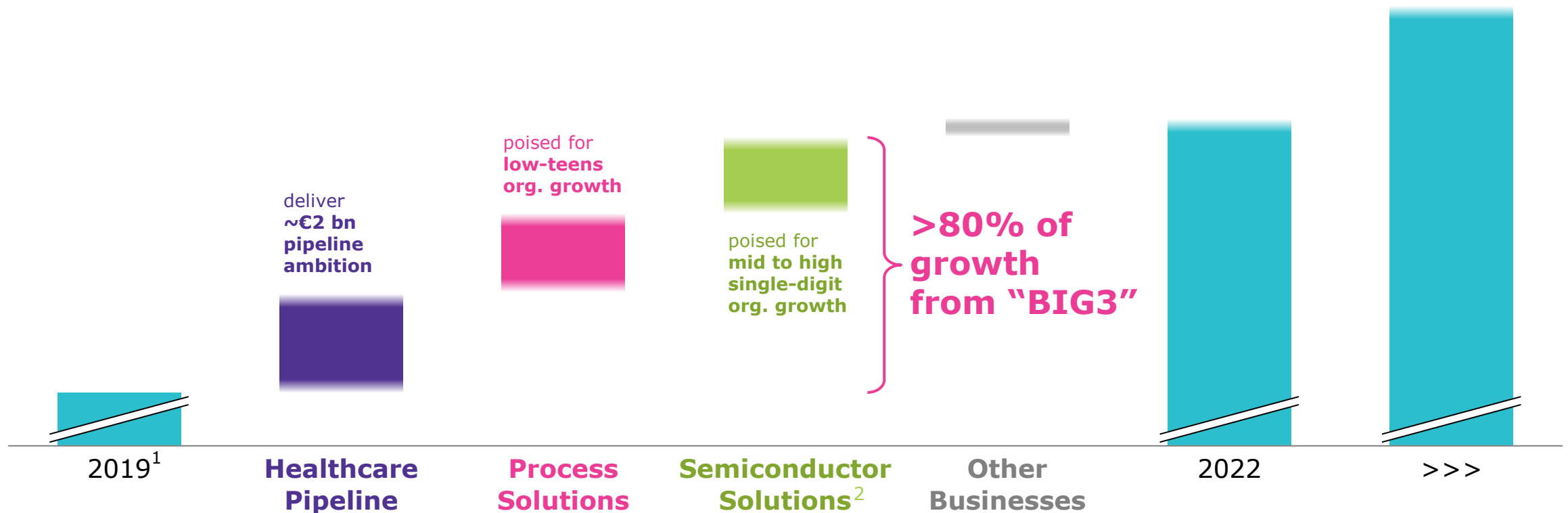


**Purposefully positioned in attractive markets with secular growth above global GDP
...further focusing investments on attractive sub-segments**

¹ 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

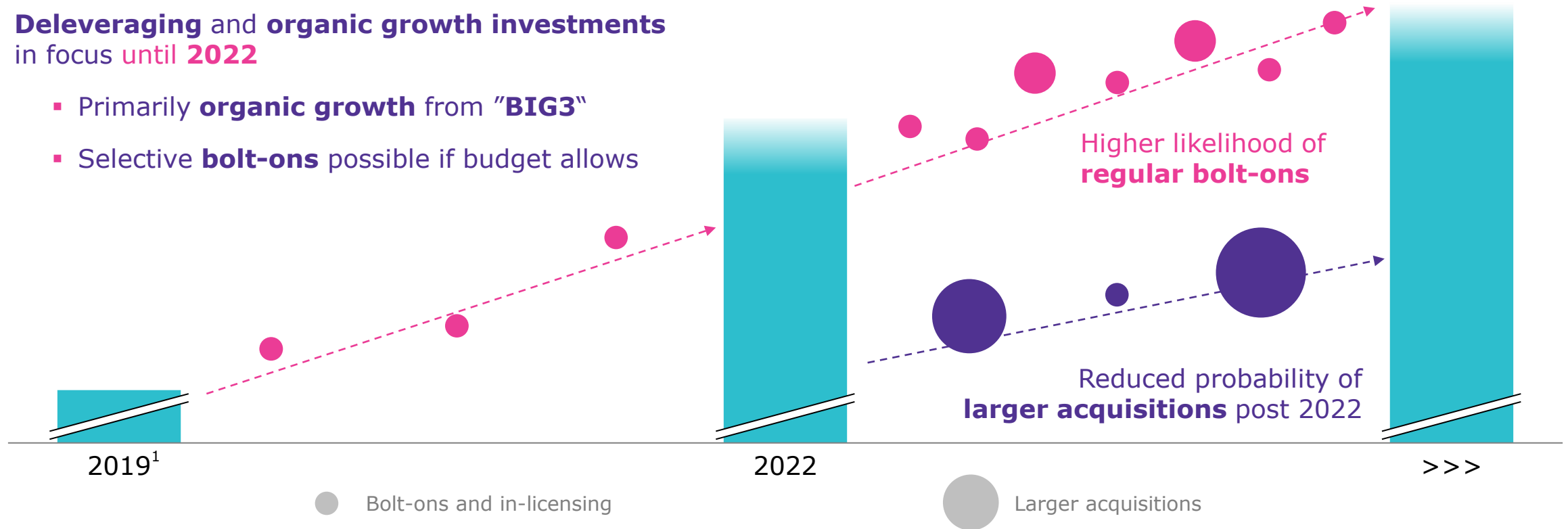
¹ 2019 Group sales of €16.2 bn; ² Including Versum portfolio effect



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**

¹ 2019 Group sales of €16.2 bn

Healthcare

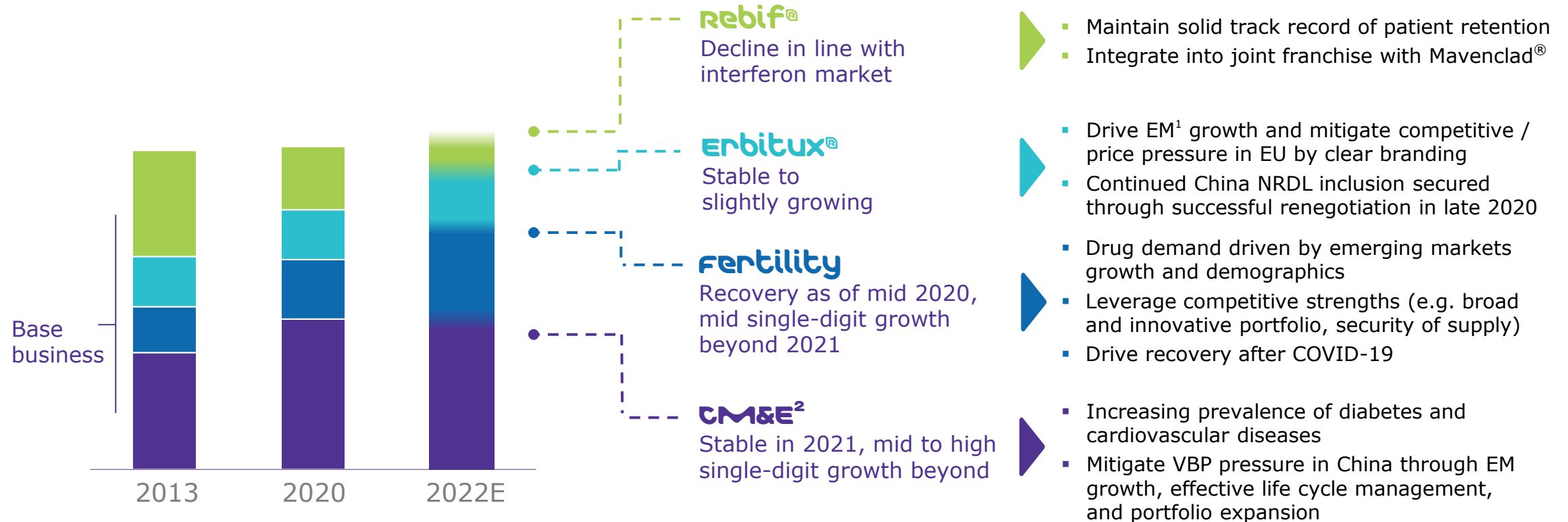
Executing on the earnings phase

03

Healthcare: Base Business

Ambition to keep base business ~stable throughout 2021 and 2022

Healthcare base business net sales until 2022



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



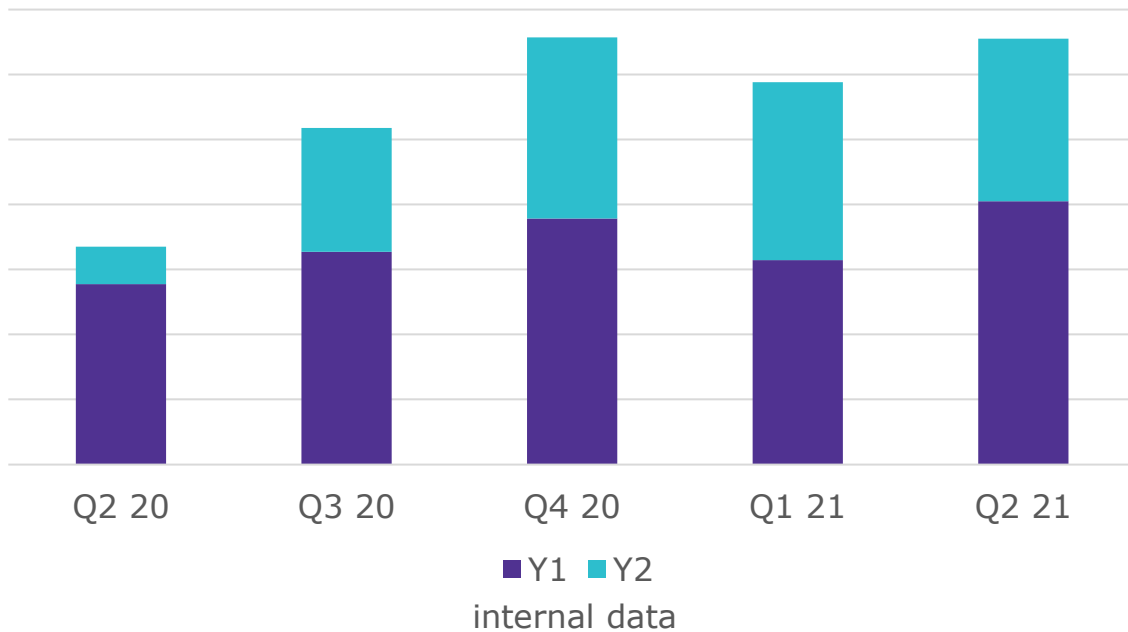
Healthcare: Mavenclad® US

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 ^a
DMT treated patients	Mavenclad®	23	100% ($p = 0.99$) ^b
	Ocrelizumab	44	22.7% ($p < 0.0001$) ^b
	Fingolimod	26	3.8% ($p < 0.0001$) ^b
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 counts¹

DMT = disease-modifying therapy

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

^aProtective humoral immunity defined as an index value higher than 1.1 using EUROIMMUN semiquantitative ELISA for IgG specific for the recombinant S1 subunit of SARS-CoV-2 spike protein

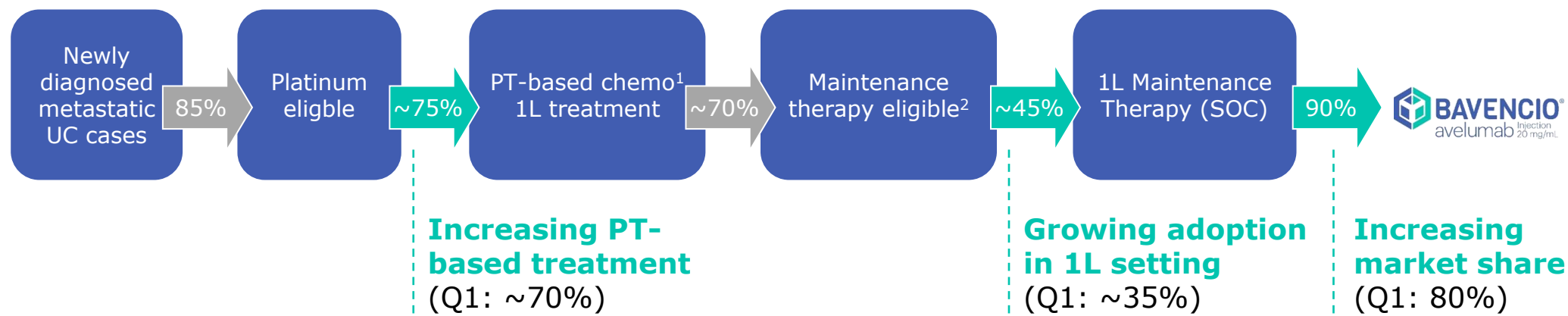
^bFisher's exact test to detect differences in categorical variables between DMT-treated patients with MS and untreated patients with MS



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:



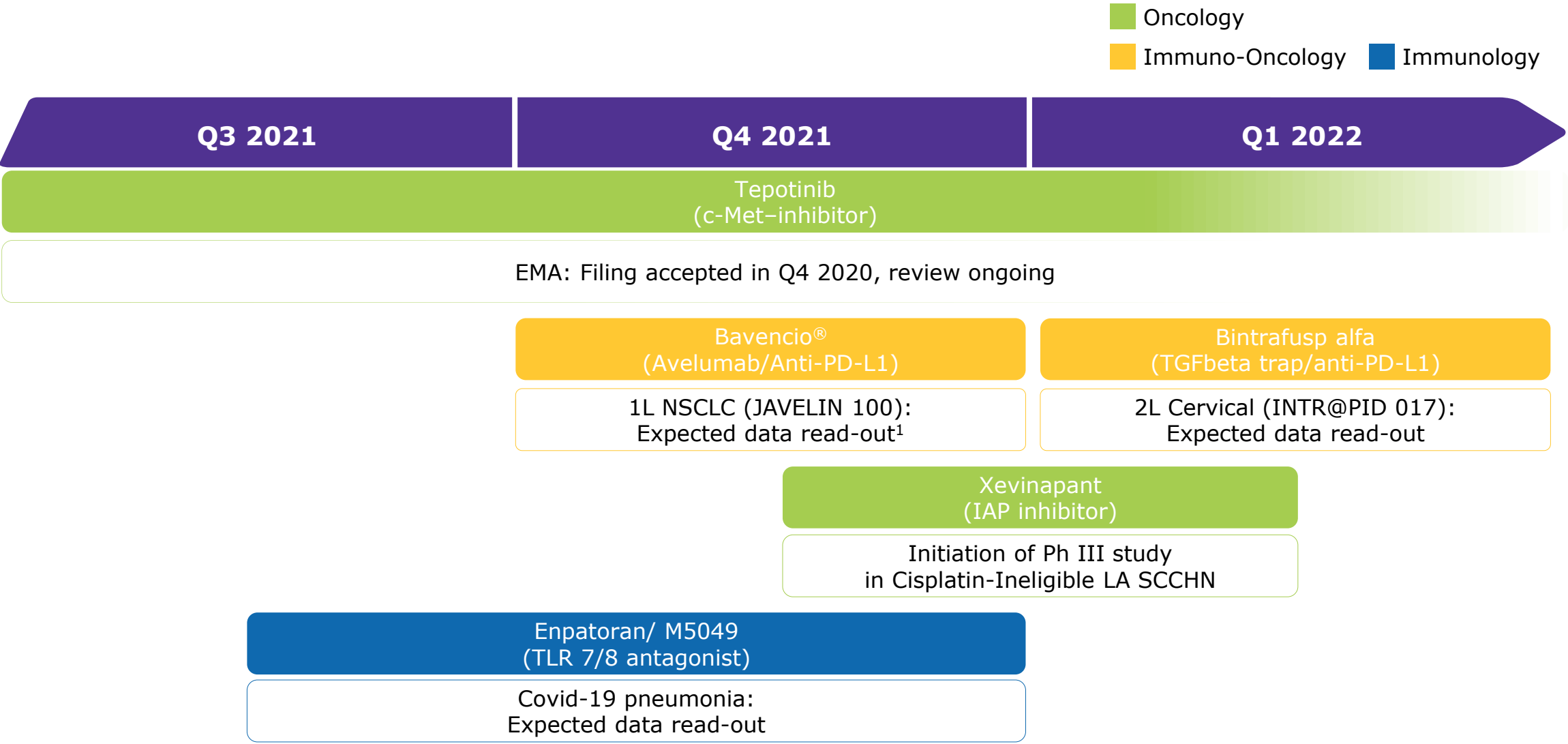
Europe & Japan – Recently approved, encouraging uptake:

- 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

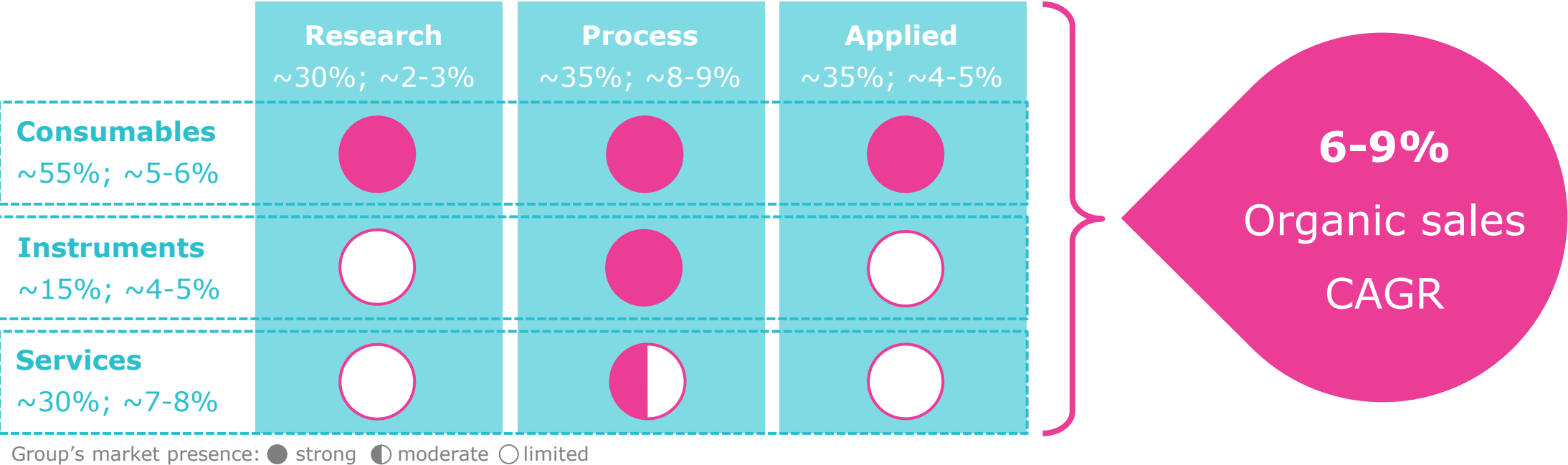
04

Life Science

Building growth momentum with focus on attractive market segments

Total Life Science Market¹
~€170-180 bn; ~5-6% CAGR

Mid-term outlook
Life Science Business Sector

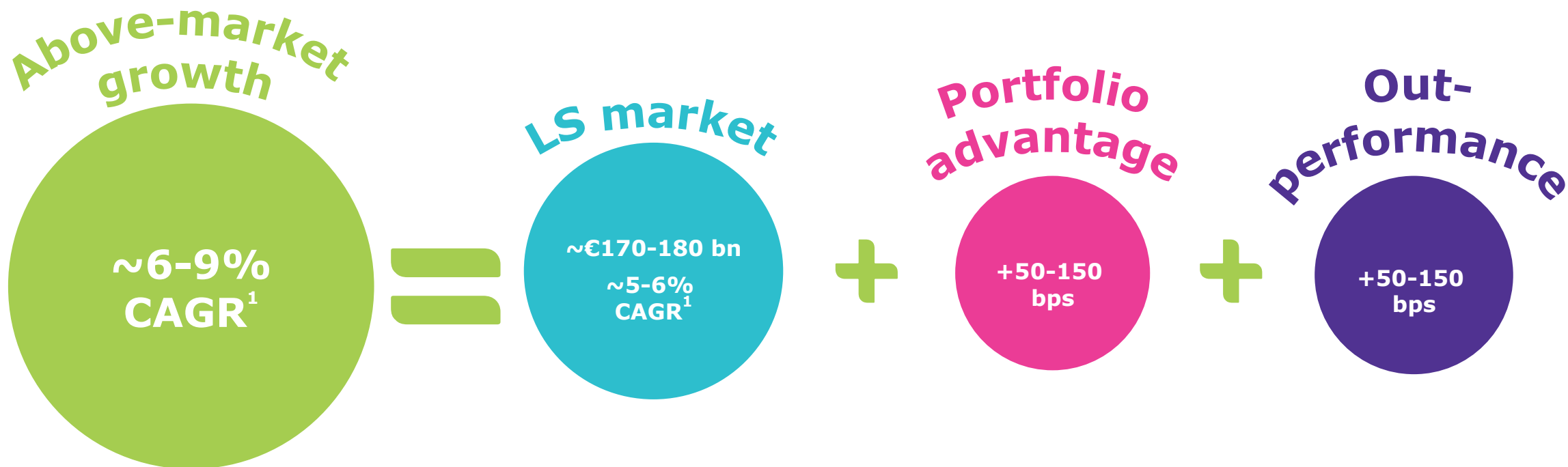


 Upgrading mid-term financial ambition to 6-9% organic sales CAGR

¹ 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

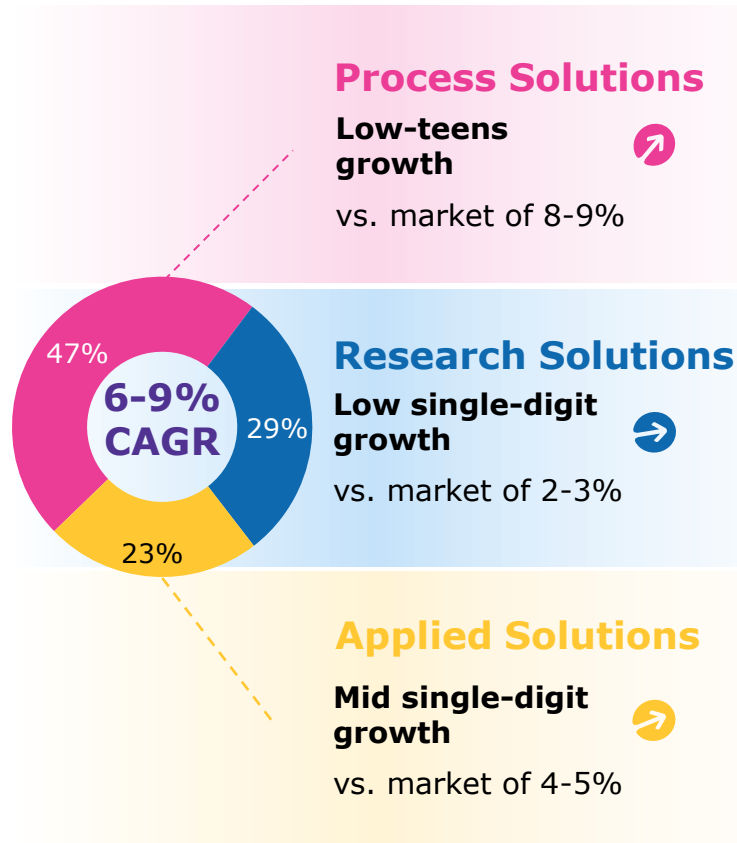


- Market outlook improving further, mainly due to **Process** segment
- Above-market growth set to continue due to **portfolio advantage** and **outperformance**

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

All business units contributing to above-market growth

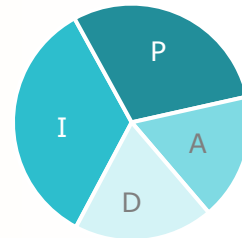
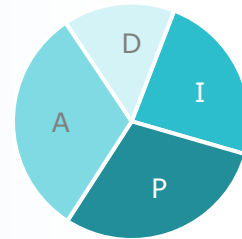
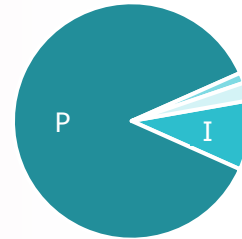
Sales split¹



Mid-term outlook²

Customer Split³

Fundamental growth drivers



- **Biologics:** global mAbs⁴ production growing by ~11-15% p.a. for 2020-2024⁵ driven by new molecules and biosimilars
- **Diversification:** contribution by top 10 molecules will decline to ~30% until 2024 from ~50% in 2020⁶
- **Novel modalities:** cell & gene therapy market with >30% CAGR 2020-2024⁵, complex delivery drives demand for services and viral vectors
- **Research activity:** >9,000 pre-clinical projects in research pipelines⁷; rising number of experiments backs healthy growth in biotechs/CROs⁸
- **Public and private funding:** availability, access and predictability drive demand from academia and emerging biotechs
- **Emerging technologies:** high growth technologies for drug discovery and development, e.g. advanced cell culture and AI drug discovery
- **Regulation:** rise in quality standards and increasing demand for testing across customer segments
- **Population and economic growth:** demand for access to more sophisticated products and services rises, e.g. in emerging markets
- **Speed:** need for fast testing results raises requirements for Applied customers, esp. in clinical testing and food & beverage testing

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

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

Critical offering in the fight against COVID-19



PRODUCTS feed into...

www.sigmaaldrich.com/covid-19

VIRUS DETECTION

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

VIRUS CHARACTERIZATION

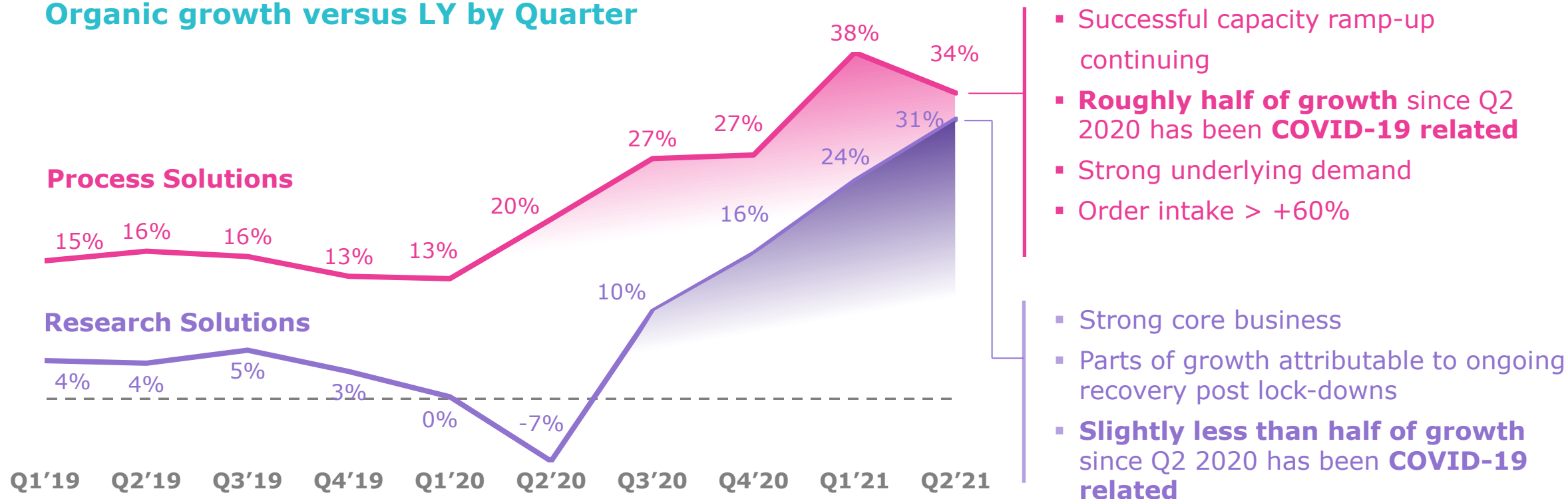
- Offering is among largest biologic reagents and hardware portfolios
- Effective vaccines and therapies start with reliable virus characterization
- Highest quality reagents needed for understanding of viral attachment, genomics, or proteomics

VACCINE & THERAPY PRODUCTION

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

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

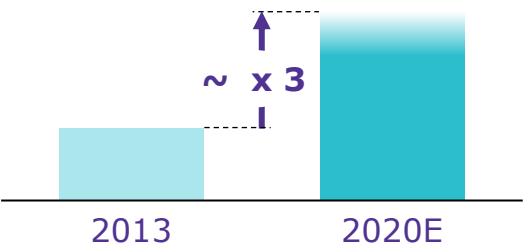
Leveraging the portfolio shift

05

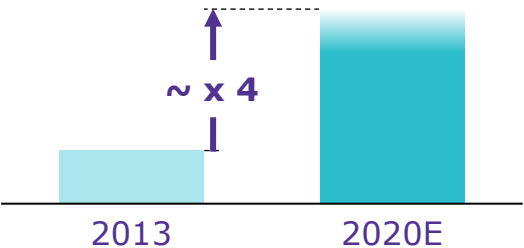
Electronics

Portfolio shift leads to greater resilience and accelerated growth

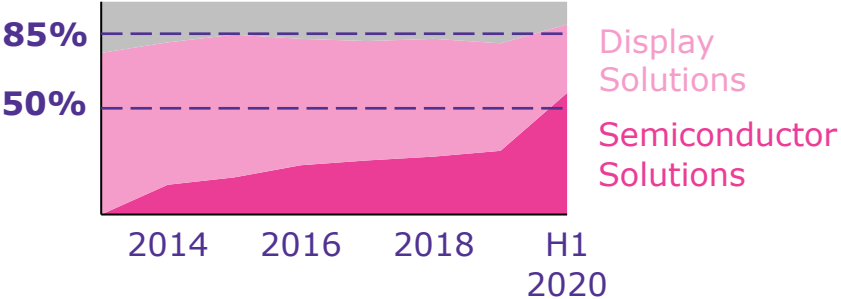
of customers
[that make up 80% of Sales]



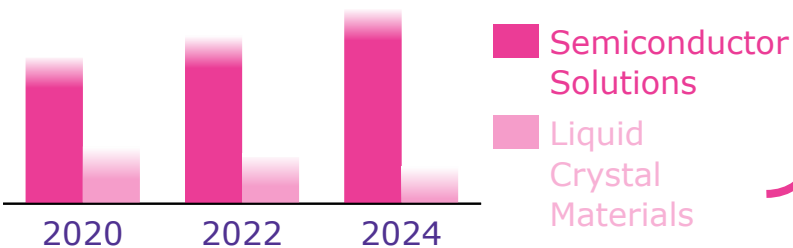
of product groups
[that make up 80% of Sales]



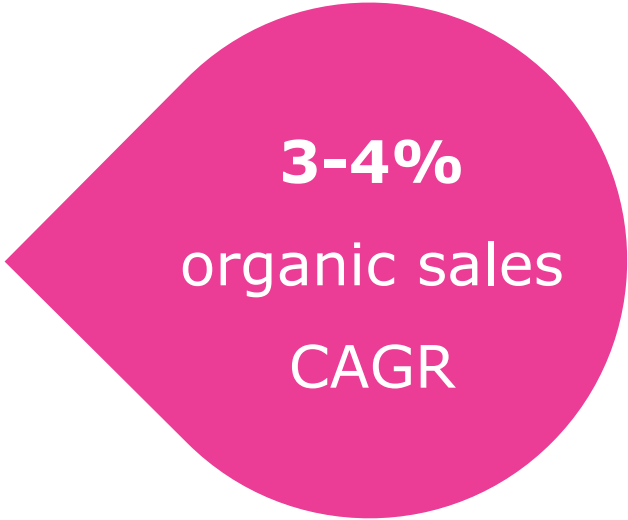
Electronics sales split
[% of total]



Semi vs. Liquid Crystals
[illustrative anticipated sales development]



Mid-term outlook
Electronics



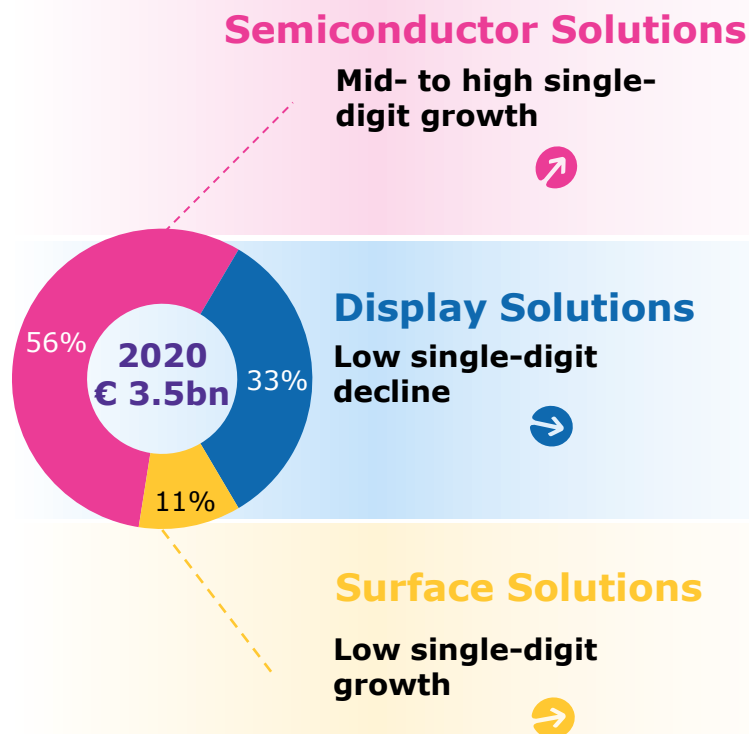
Updating mid-term financial ambition to 3-4% organic sales CAGR



Electronics

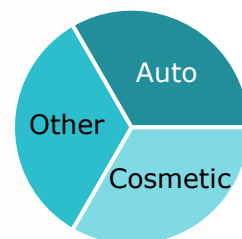
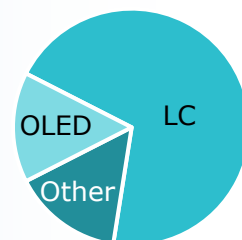
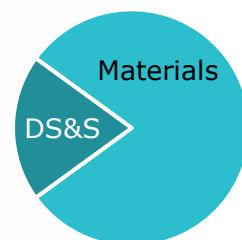
Portfolio refocus drives mid-term guidance upgrade to 3 to 4% CAGR

Sales split¹



Mid-term outlook²

Business Split³



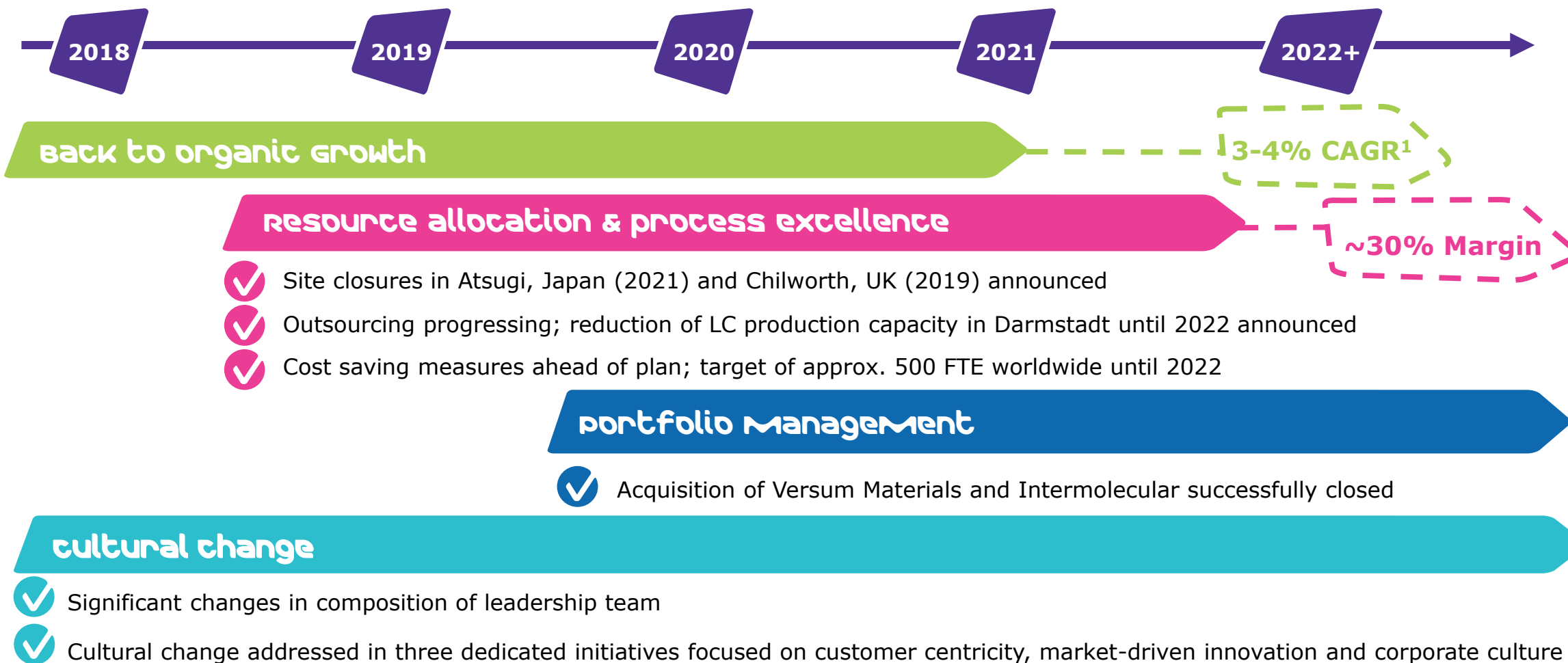
Fundamental growth drivers

- 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 growth⁴
- 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 m² area⁵, while price pressure continues
- 18 to 22% growth of total OLED m² area⁵ with slight to moderate market share gains
- OLED material market to exceed LC material market by 2021⁶
- 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 beyond⁷

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

⁴ Source: Jan 2020 IC Insights 2018-2024 CAGR for wafer starts in million units; ⁵ Source: Omdia Display Market Outlook, Q1 2020; ⁶ Internal Business Intelligence; ⁷ 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



¹New 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



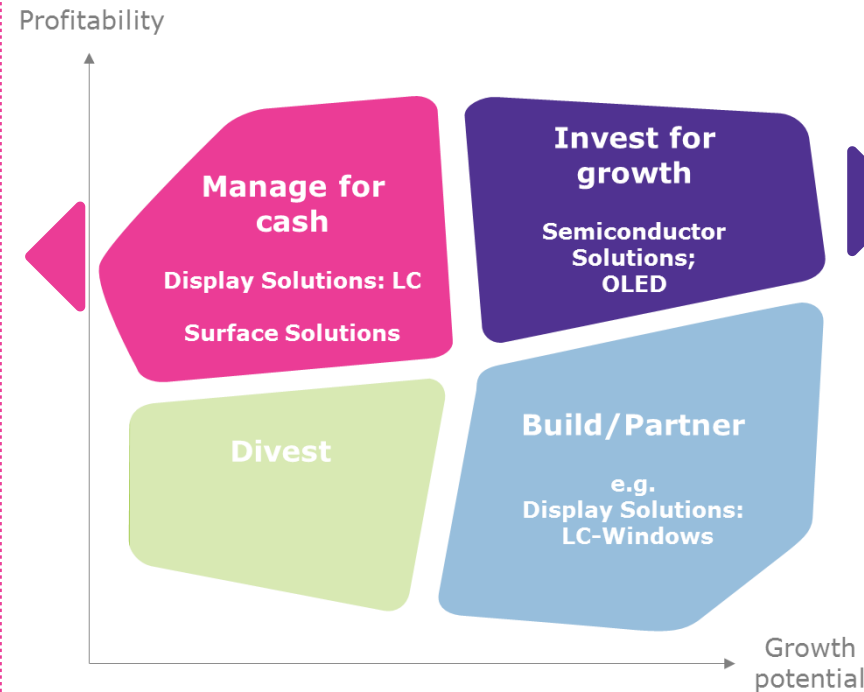
Chilworth

- 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

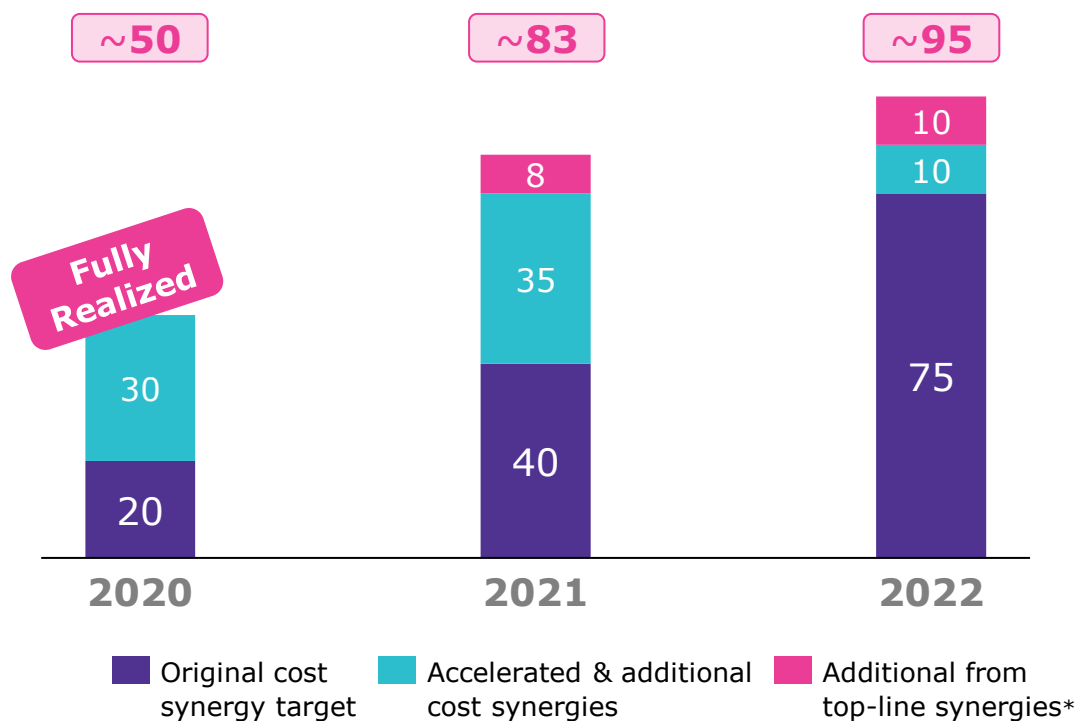


Both transactions successfully closed



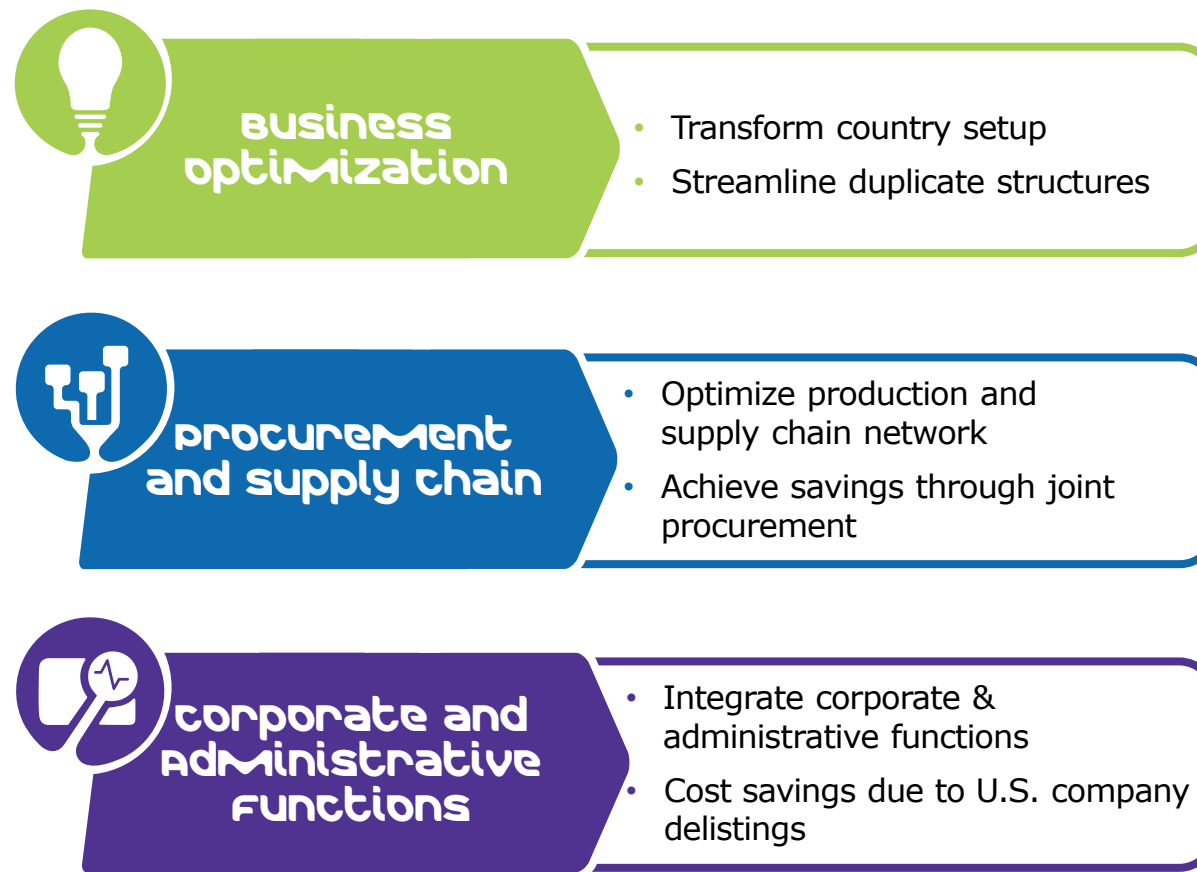
Successful integration drives substantial synergy upgrade and acceleration

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



Original target for 2022 is now being addressed for 2021

Sources of synergies

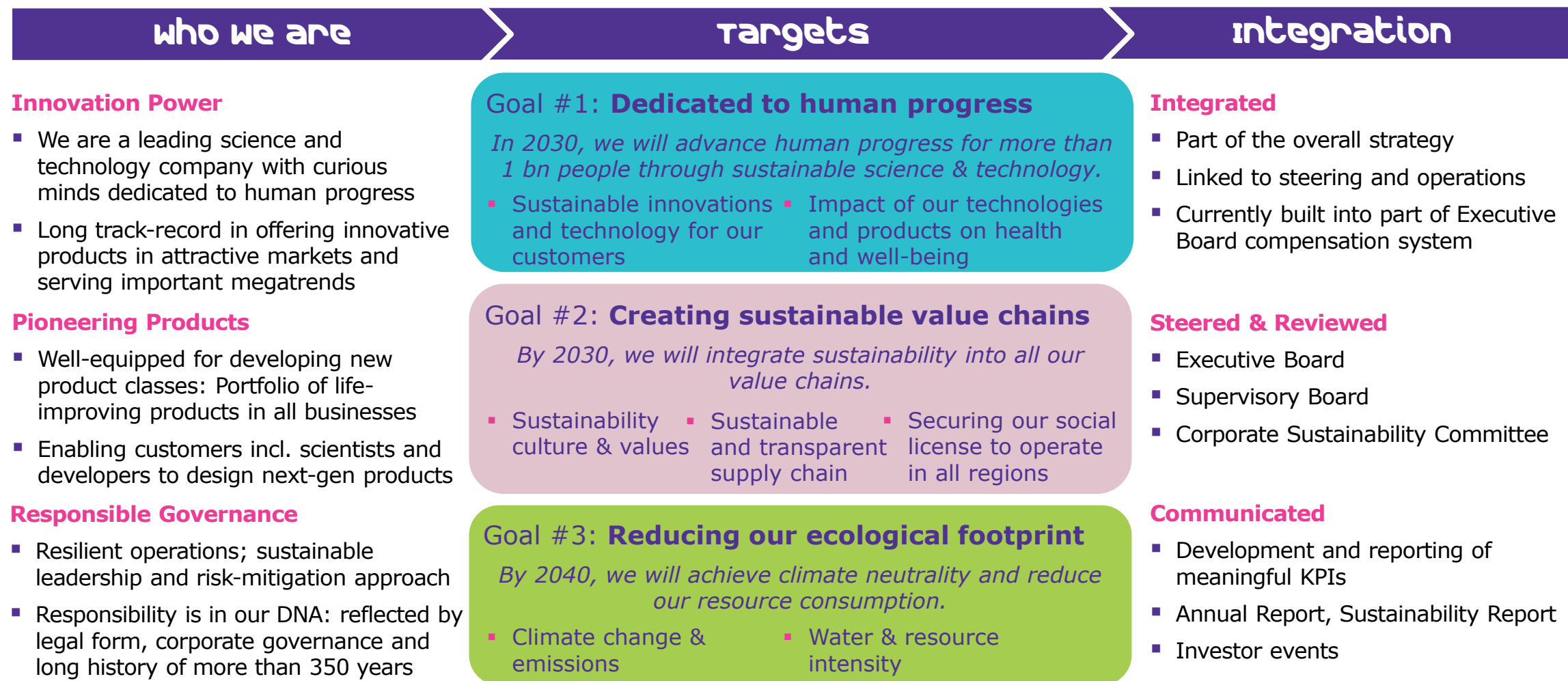


*Top-line synergies from cross-selling, new products introductions and overarching initiatives


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

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 sites⁴ 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)



¹versus 2006 baseline, excluding Versum Materials

²versus 2014 baseline

³versus 2016 baseline

⁴Sites > 70.000 m³/a

New targets from 2021

- Aiming for **climate neutrality** (scope 1 to 3 emissions) **by 2040** 
- **Lower scope 1 and 2 GHG⁵ emissions by 50%** and to source 80% of purchased electricity from renewable sources until 2030 vs. 2020 baseline
- **Absolute reduction of 1,500 kt⁶ scope 3 CO₂ 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

⁵GHG = Greenhouse Gas

⁶corresponds 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 tool² to measure product sustainability value

Link ESG¹ 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

goal 01

Dedicated to human progress

goal 02

Creating sustainable value chains

goal 03

Reducing our ecological footprint

¹ESG: Environmental, Social, Governance

²Sustainable 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. Biogen¹*)

FX: -2% to -4% YoY

~€5.6 – 6.0 bn

EPS pre:

~ €7.80 – 8.50

¹ 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**

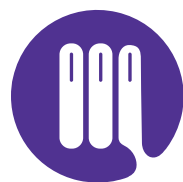
Executive SUMMARY



Group

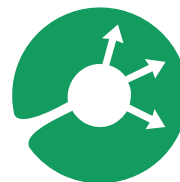
Successfully driving transformation into a leading science and technology company

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 exposure¹



FX impact on EBITDA pre²



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 exposure¹



FX impact on EBITDA pre²



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 exposure¹



FX impact on EBITDA pre²



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



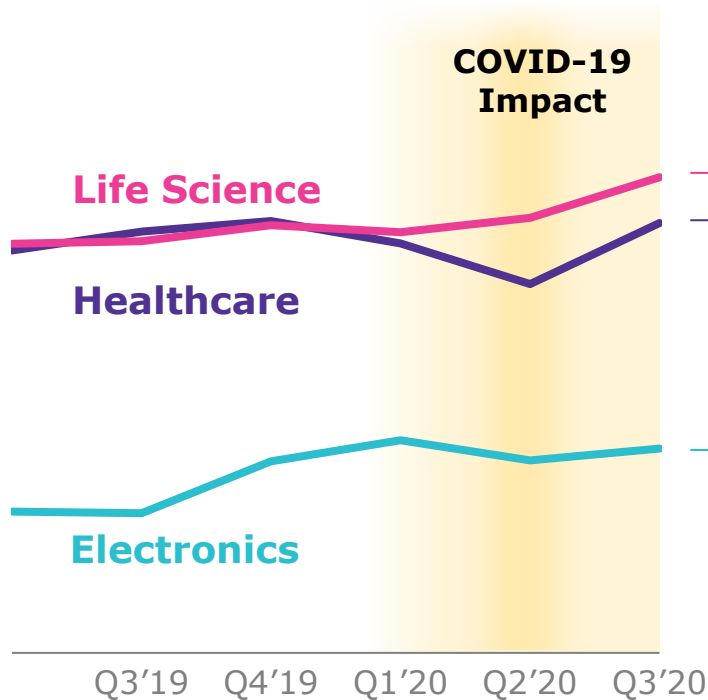
Divestment history - Focusing on profitable core areas

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^{*}



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 Mavenclad[®] recovery** being driven since June
- **Bavencio[®] 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

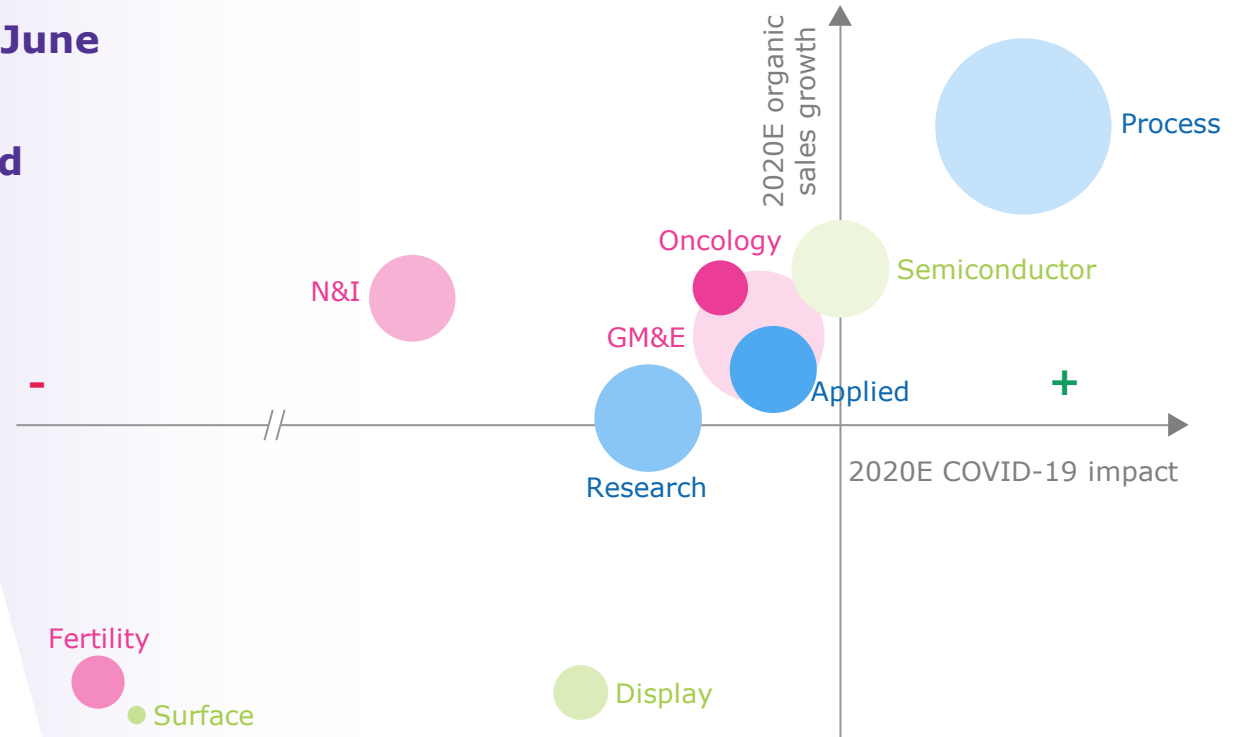
2020 – strong resilience in times of global crisis

- **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 business¹



CMD 2019

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



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



2021 business sector guidance¹

Healthcare



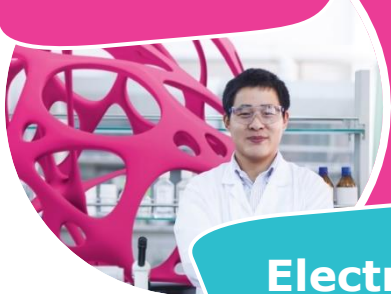
Net sales

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

EBITDA pre

- Organic: +15% to +18% YoY (excl Biogen²)
- FX: -5% to -7% YoY
- ~€2,050 – 2,150 m

Life Science



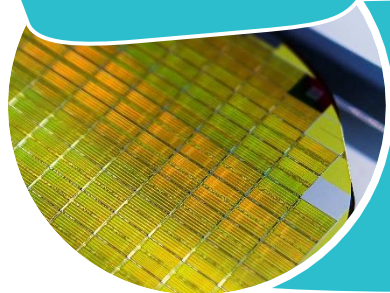
Net sales

- 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

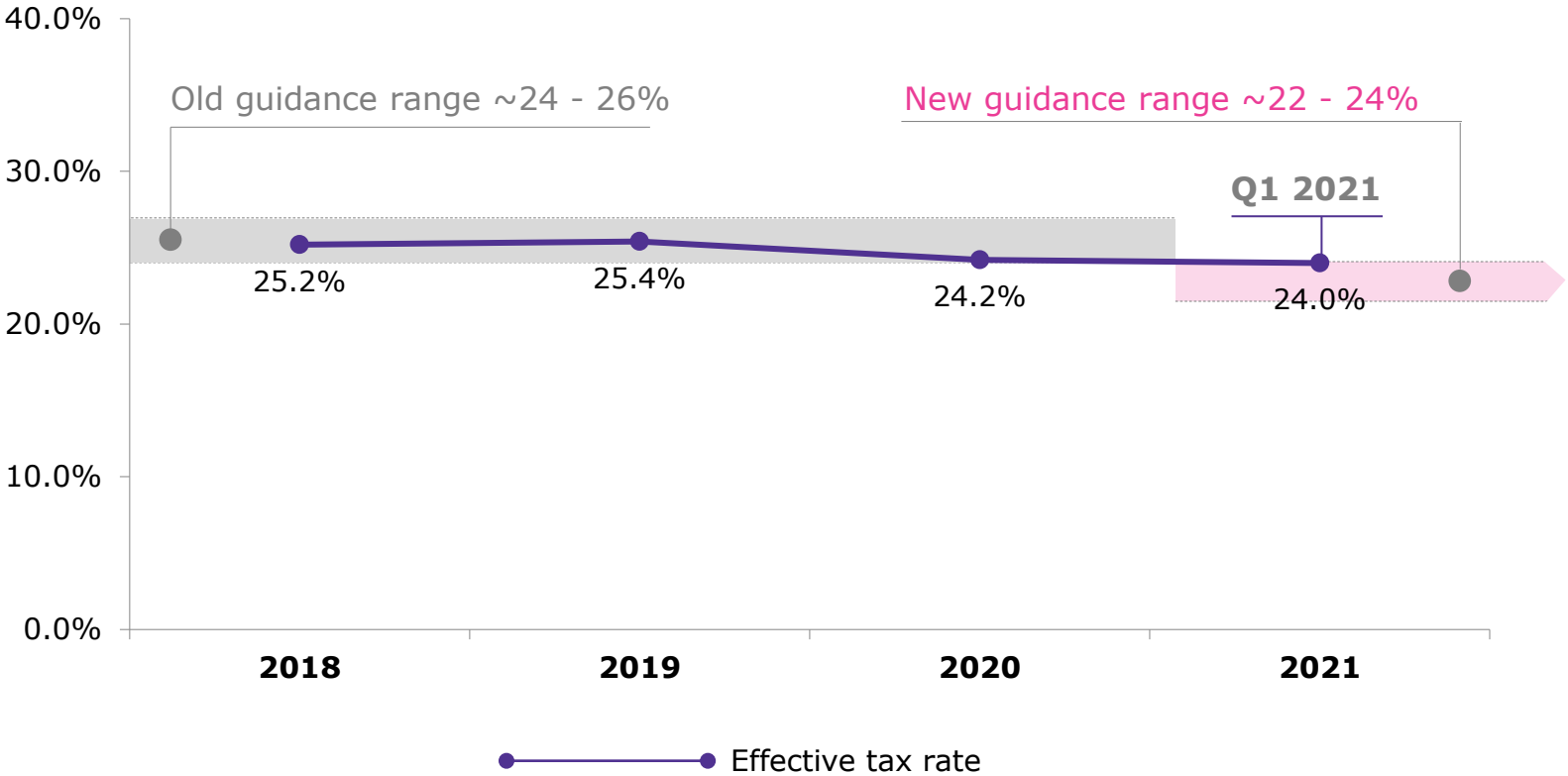
Further financial details

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



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

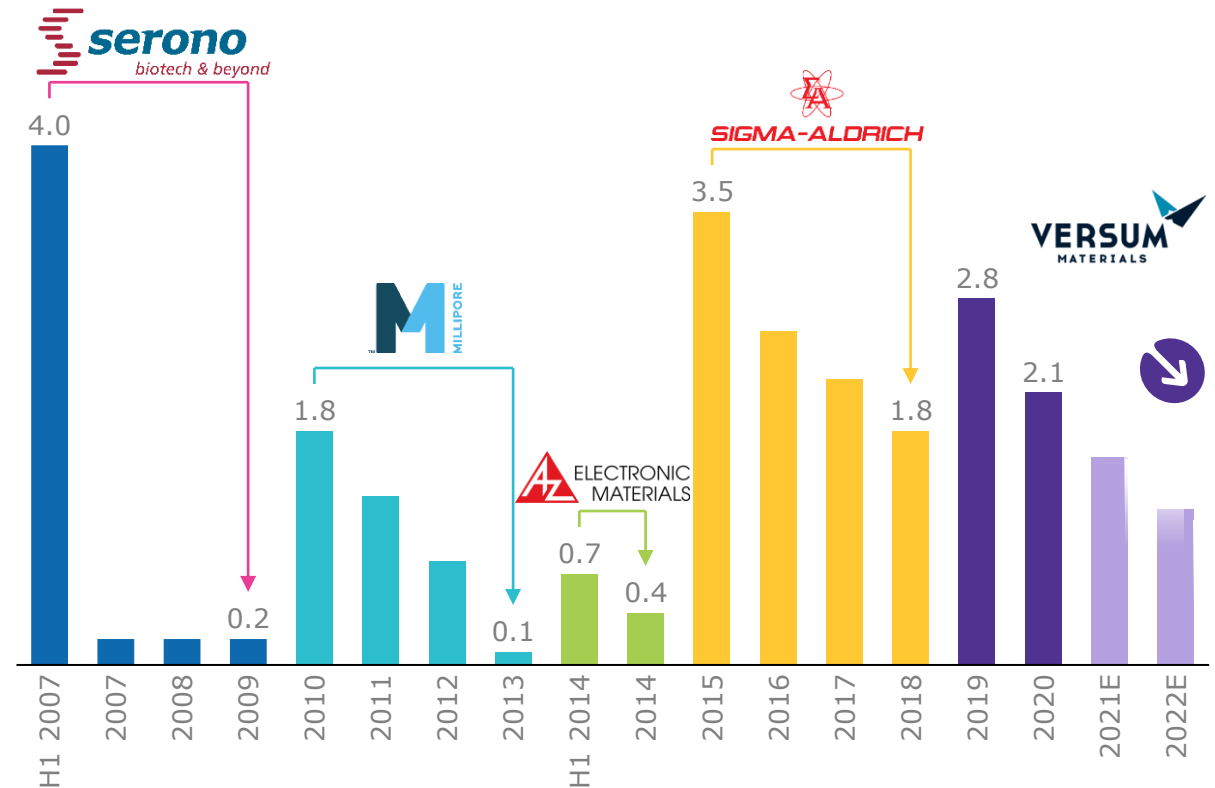
Focus on organic growth and further deleveraging

Proven swift deleveraging after major acquisitions

UPDATE

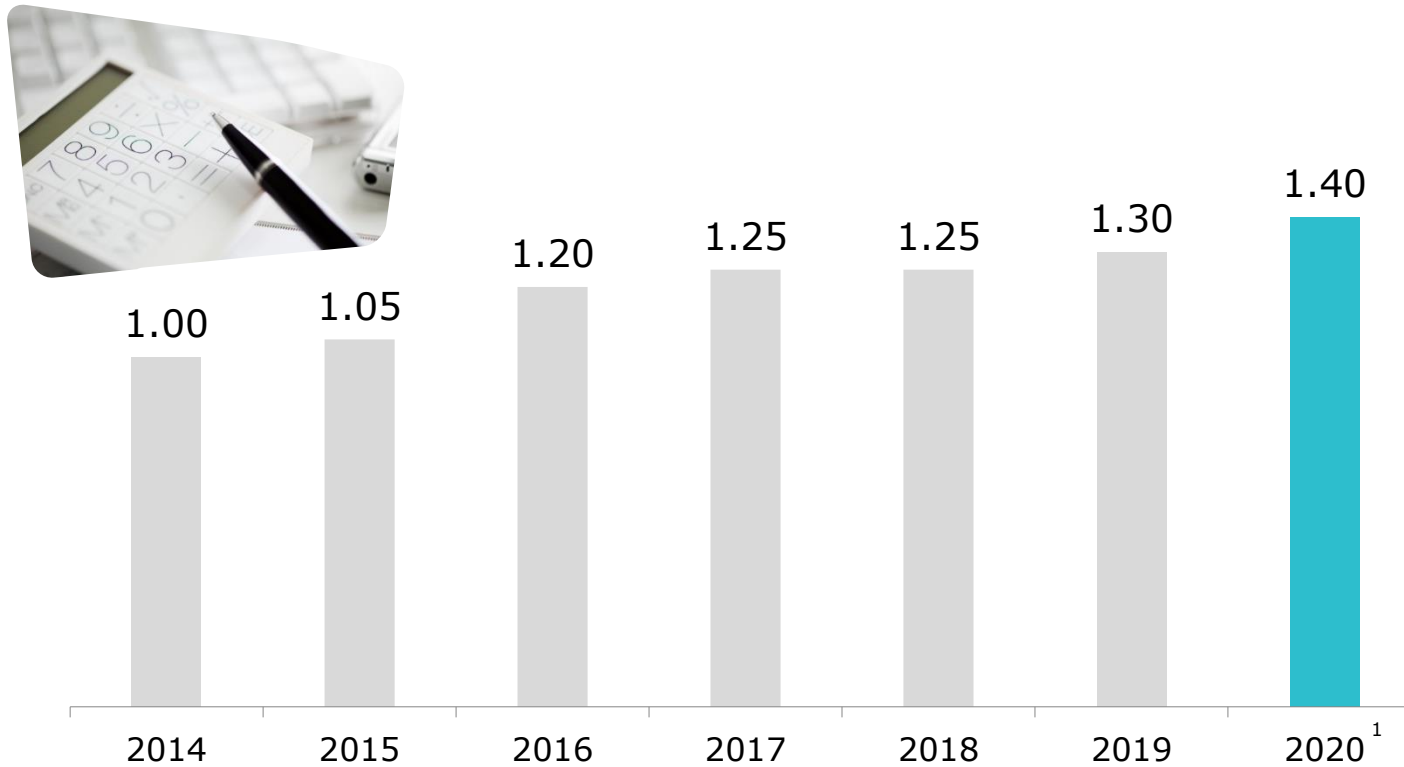
- **Deleveraged to ~2x** net debt/EBITDA pre already in 2020
- **M&A on hold until 2022**; only smaller deals to be realized if budget available
- New mid-term capex ceiling of ~€1.4 – 1.5 bn reflects **increased focus on organic investment**
- Dividend policy mirrors **sustainable earnings trend**

Net debt / EBITDA pre track record & outlook



Sustainable dividend growth

Dividend development 2014 - 2020



2020 dividend

- Dividend of €1.40 (+8% YoY) per share approved¹ by Annual General Meeting
- Payout ratio of 23.1% of EPS pre² in 2020; aiming for 20-25% of EPS pre
- Dividend yield³ of 1.0%

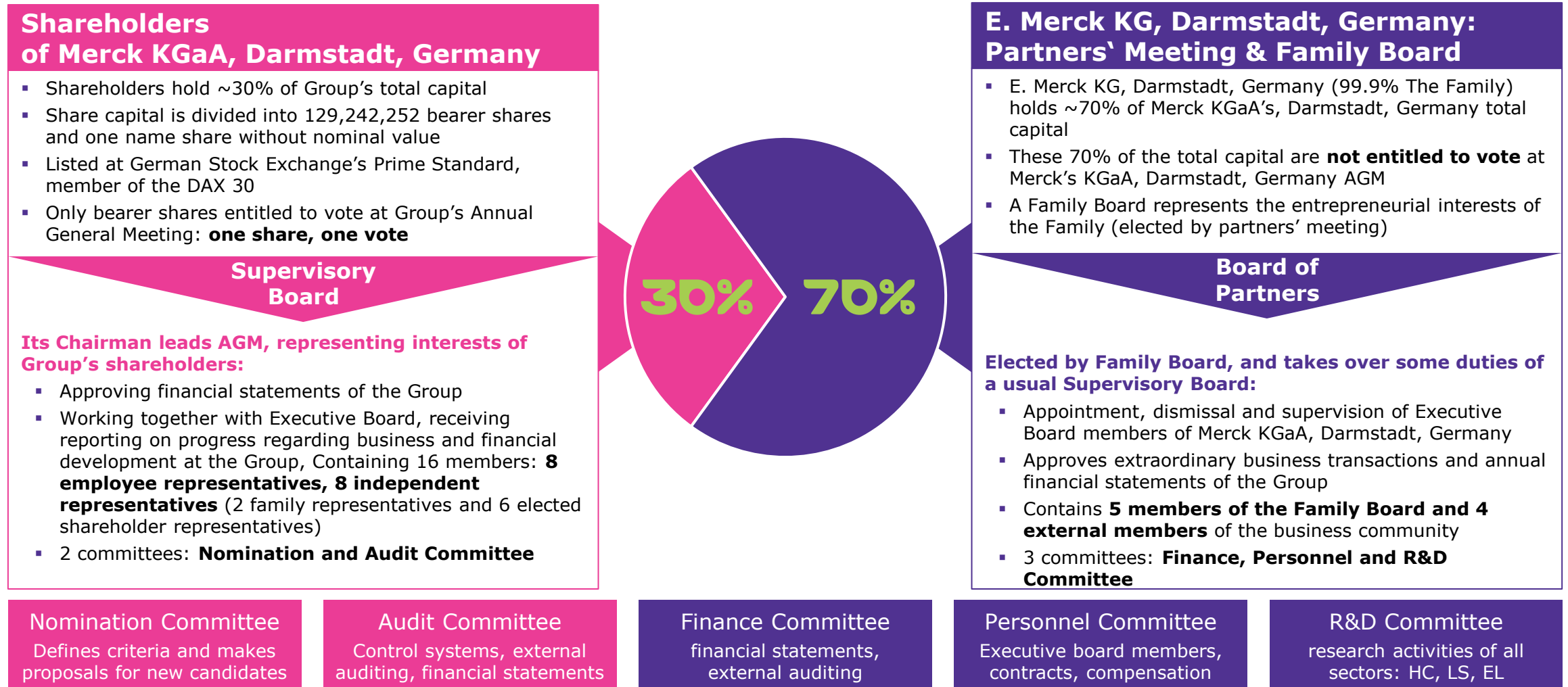
¹April 28, 2021: Pay Date

²Excluding Biogen provision release, including the provision release the ratio is 20.9%

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

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

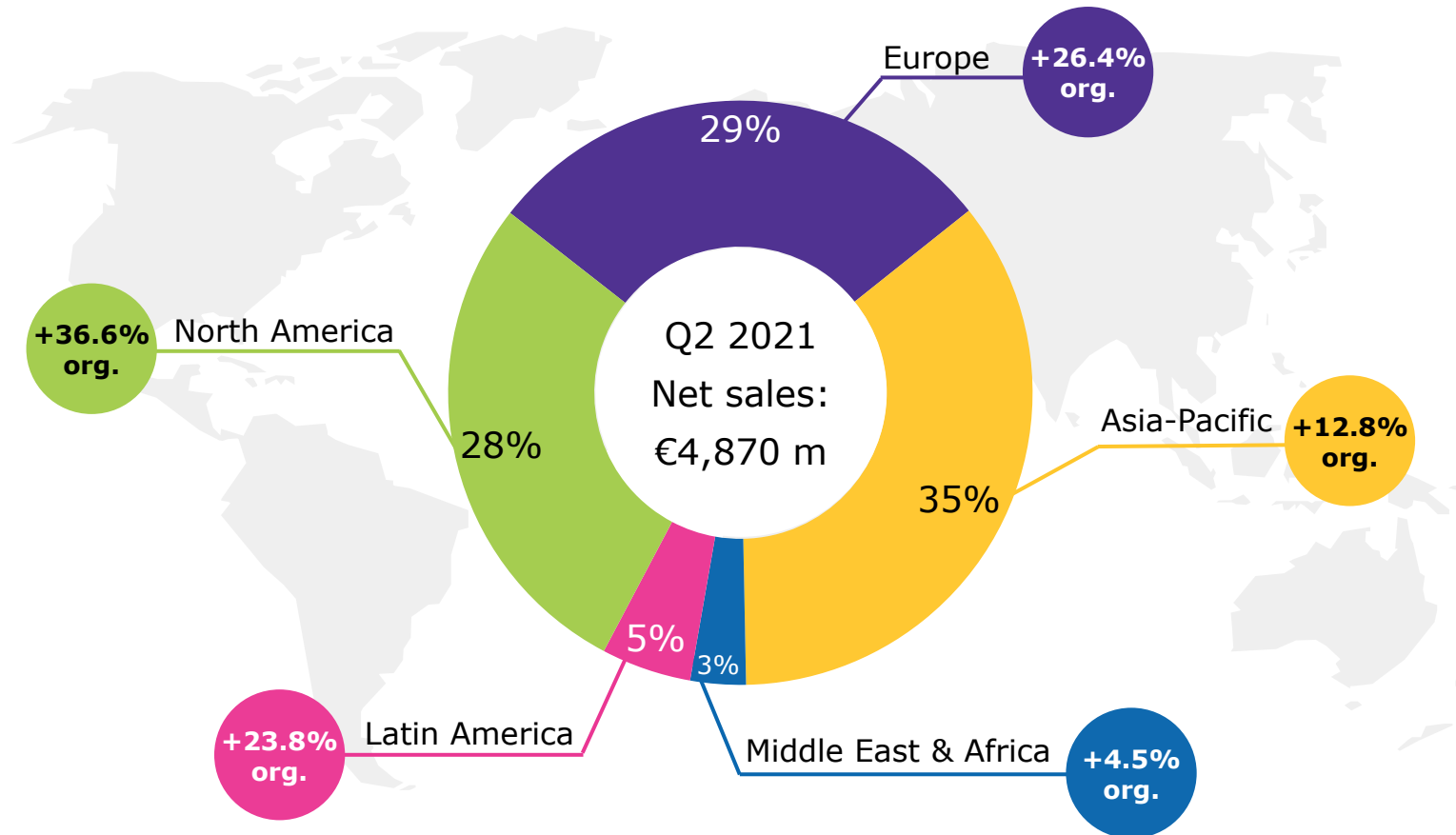
- Supporting profitable growth strategy
- $IRR > WACC$
- EPS pre accretive
- Maintain investment grade rating



- **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



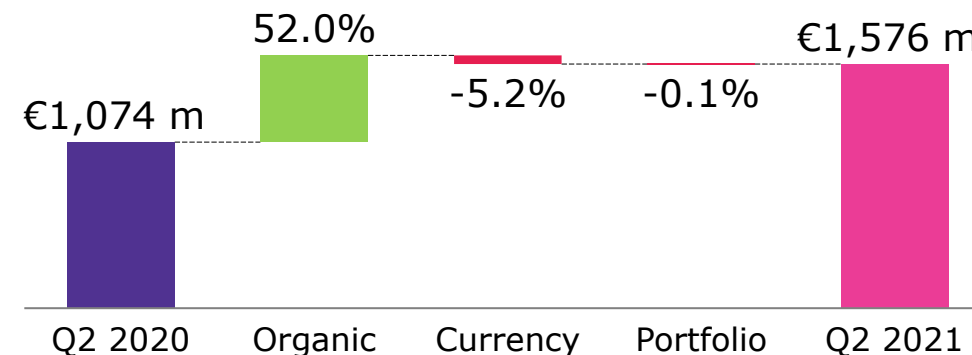
Strong Life Science demand and robust Healthcare recovery drive 23% sales and 52% EBITDA pre organic growth

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%
Group	23.0%	-4.8%	0.0%	18.2%

- Strong recovery in Fertility well above pre COVID-19 levels, organic Mavenclad[®] 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



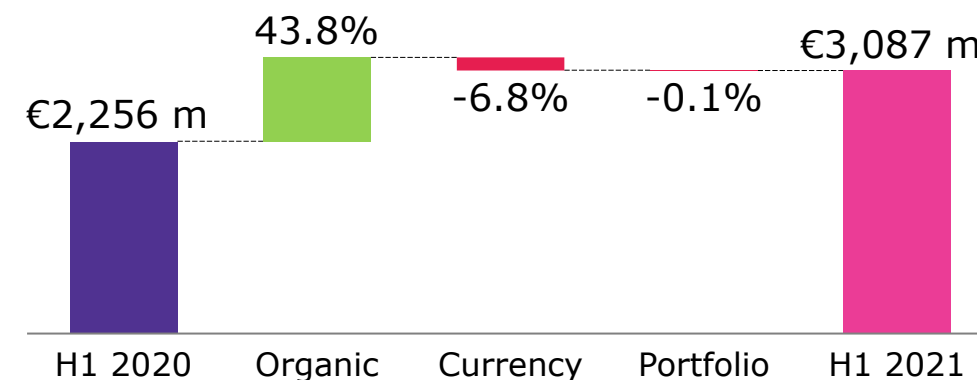
Strong performance across all sectors drives 17% organic net sales growth and 44% organic EBITDA pre growth against COVID-19-impacted H1 2020

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%
Group	17.4%	-5.3%	-0.2%	11.9%

- 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

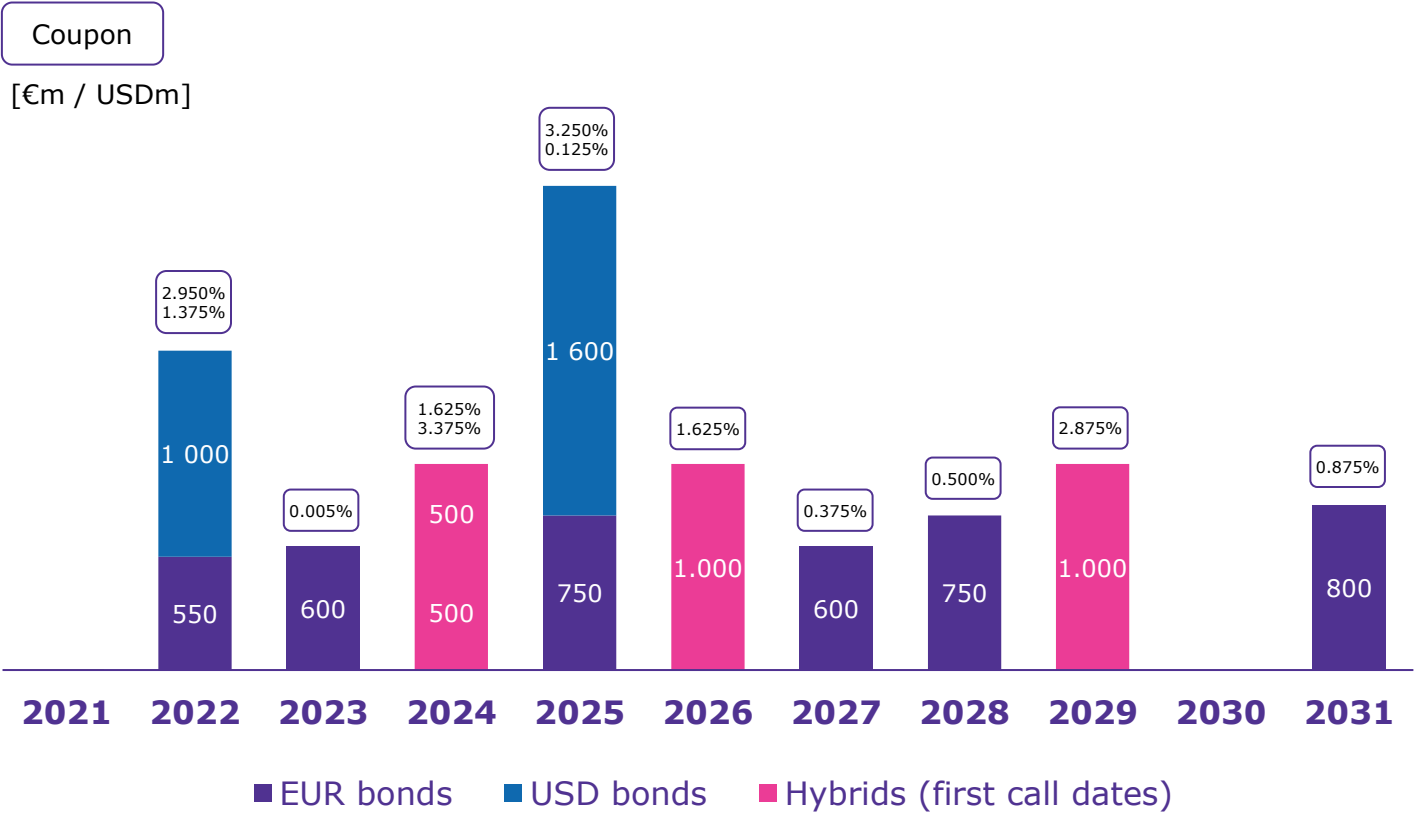


- EBITDA pre grows faster than sales organically, largely driven by strong operating leverage in Life Science and Healthcare vs. a weaker H1 2020
- FX headwinds primarily from USD, JPY & BRL amount to burden of -5% on net sales and -7% on EBITDA pre



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	4,870	18.2%
EBITDA pre	1,074	1,576	46.7%
Margin (in % of net sales)	26.1%	32.4%	6.3pp
EPS pre	1.30	2.24	72.3%
Operating cash flow	502	888	76.9%

[€m]	Dec. 31, 2020	June 30, 2021	Δ
Net financial debt	-10,758	-10,141	-5.7%
Working capital	3,938	4,222	7.2%
Employees	58,096	58,382	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	9,501	11.9%
EBITDA pre	2,256	3,087	36.9%
Margin (in % of net sales)	26.57%	32.49%	5.919%
EPS pre	2.80	4.42	57.9%
Operating cash flow	1,019	2,104	106.6%

[€m]	Dec. 31, 2020	June 30, 2021	Δ
Net financial debt	-10,758	-10,141	-5.7%
Working capital	3,938	4,222	7.2%
Employees	58,096	58,382	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	1,049	113.6%
Financial result	-102	-95	-7.3%
Profit before tax	389	955	145.4%
Income tax	-100	-208	107.9%
<i>Effective tax rate</i>	25.7%	21.8%	-3.9pp
Net income	290	745	157.1%
EPS (€)	0.67	1.71	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	2,092	73.3%
Financial result	-201	-154	-23.3%
Profit before tax	1,006	1,939	92.6%
Income tax	-259	-444	71.2%
<i>Effective tax rate (%)</i>	25.8%	22.9%	-2.9pp
Net income	746	1,492	100.0%
EPS (€)	1.72	3.43	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	747	458
D&A	559	419	-140
Changes in provisions	-54	88	142
Changes in other assets/liabilities	-166	-217	-50
Other operating activities	-13	19	32
Changes in working capital	-112	-168	-56
Operating cash flow	502	888	386
Investing cash flow	-216	-241	-25
thereof Capex on PPE	-194	-256	-62
Financing cash flow	-302	-1,059	-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	1,495	748
D&A	991	843	-148
Changes in provisions	-38	55	93
Changes in other assets/liabilities	-189	-56	133
Other operating activities	-24	25	48
Changes in working capital	-468	-256	212
Operating cash flow	1,019	2,104	1,086
Investing cash flow	-504	-587	-83
thereof Capex on PPE	-532	-564	-33
Financing cash flow	239	-1,054	-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	11	3
Life Science	-15	0	-6	0
Electronics	131	112	10	5
Corporate & Other	8	0	97	0
Total	138	112	112	8



Adjustments in H1 2021

Adjustments in EBIT

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





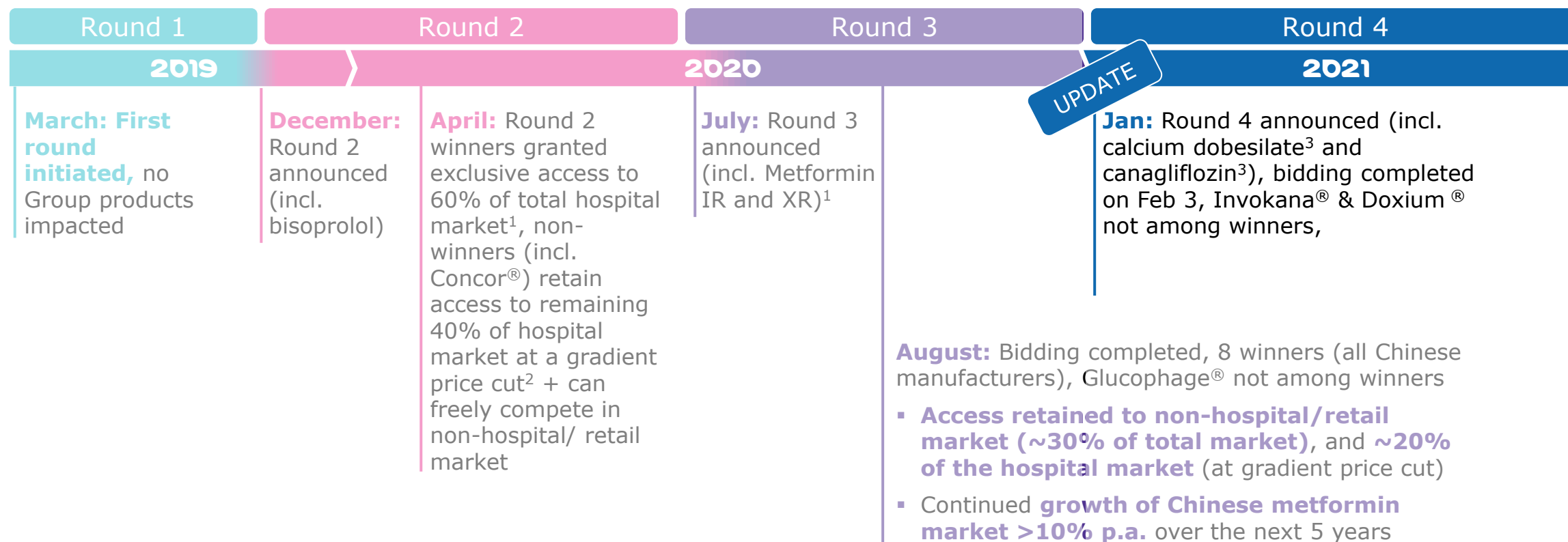
Financial Calendar

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 tumors¹

M4076
ATM inhibitor
Solid tumors

peposertib
DNA-PK inhibitor
Solid tumors²

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

M6223
anti-TIGIT mAb
Solid tumors³

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

M5717
PeEF2 inhibitor
Malaria

Phase II

berzosertib
ATR inhibitor
Small-Cell Lung Cancer⁴

tepotinib
MET kinase inhibitor
Metastatic Colorectal Cancer
RAS/BRAF wt, *MET* amplified⁵

tepotinib
MET kinase inhibitor
Non-small cell lung cancer,
EGFR mutant, *MET* amplified⁶

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^{7,8}

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 skipping⁹

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

¹ Study as monotherapy and in combination with niraparib. ² Study in combination with avelumab. ³ Includes study in combination with bintrafusp alfa. ⁴ Includes studies (phase I/II) in collaboration with/ sponsored by external partners, e.g. US National Cancer Institute (NCI). ⁵ In combination with cetuximab. ⁶ In combination with osimertinib. ⁷ In unresected LA SCCHN patients eligible for cisplatin. ⁸ 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). ⁹ 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.

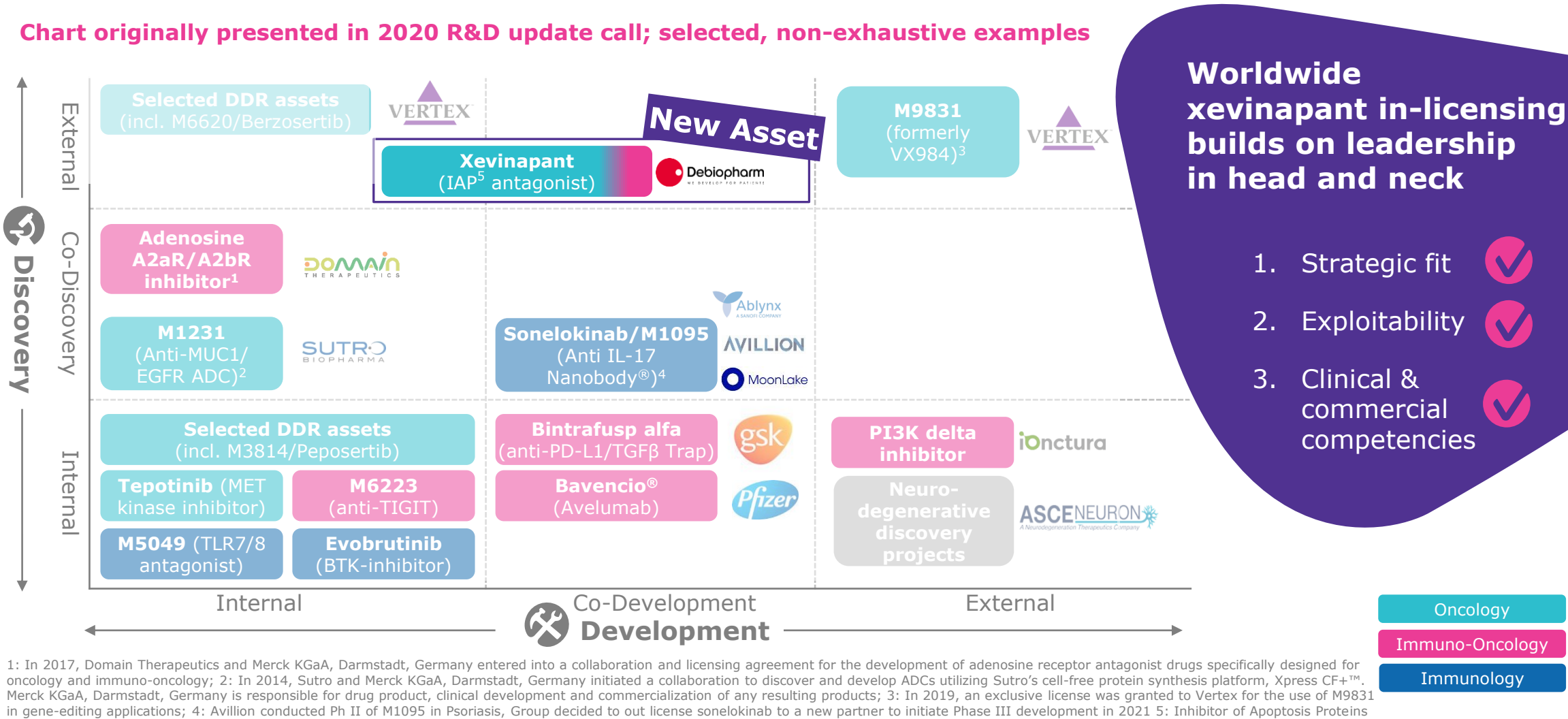
Additional information: Several combination studies (phase II) of avelumab with talazoparib, axitinib, ALK inhibitors or chemotherapy ongoing under sponsorship of Pfizer.

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

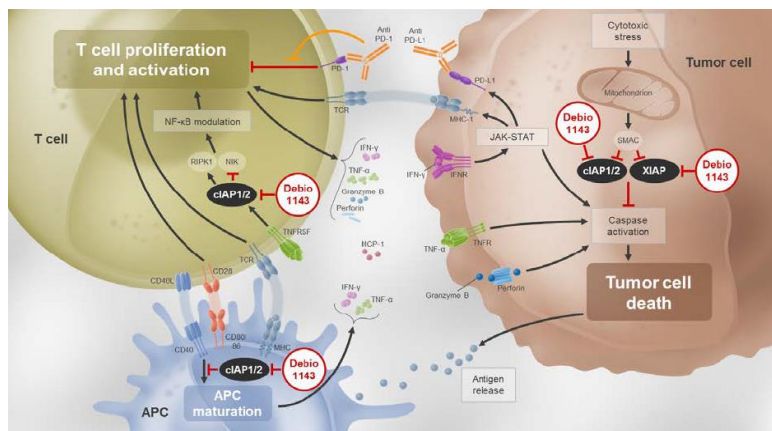
Potential to become standard of care in core area for the Group



Xevinapant (Debio 1143)

Potentially first in class oral IAP antagonist with FDA BTB

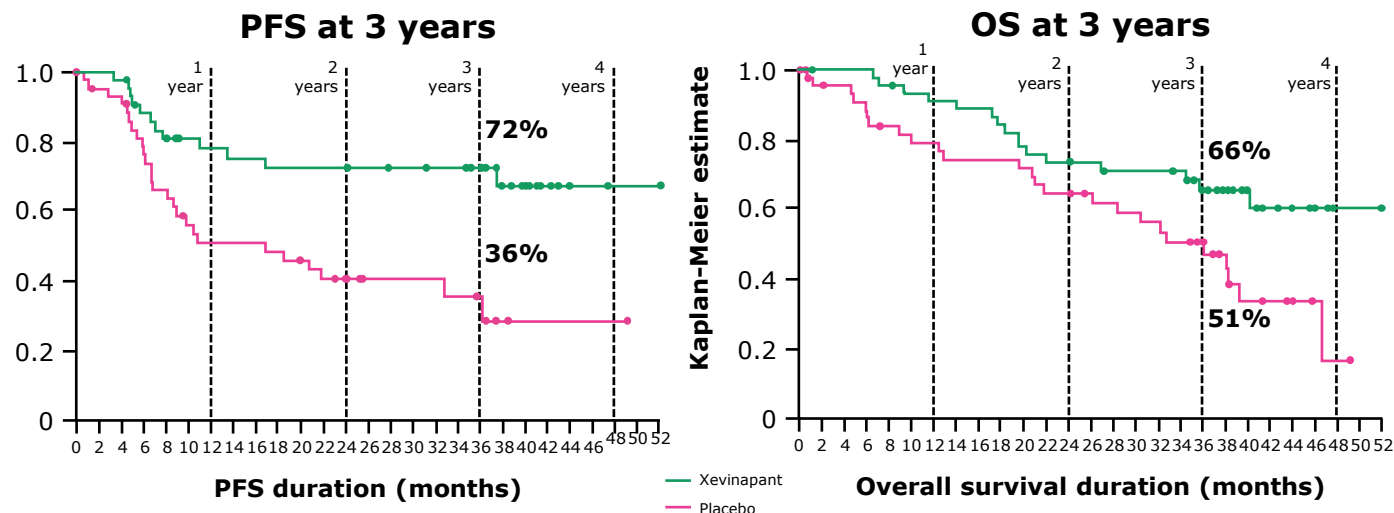
Mode of Action¹



- 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 data² 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

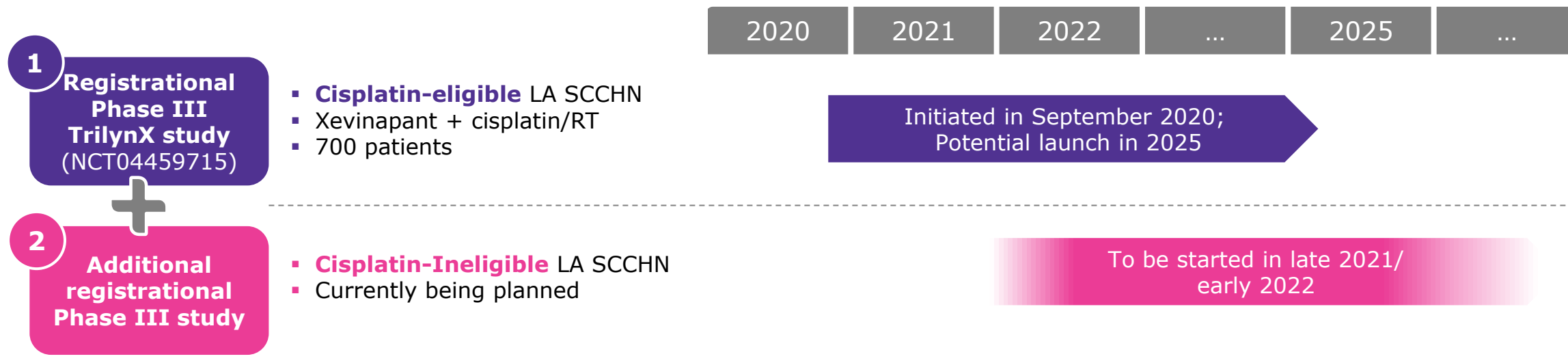
Payment type	Amount (in €)	Accounting treatment ²
Upfront payment	~ €190 m	Largest part to be capitalized as an intangible asset
Approval milestones	Up to ~ €380 m ¹	To be paid and capitalized as an intangible asset upon approval and to be amortized once asset is ready for use
Commercial milestones	Up 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"> ▪ Cash view: 50/50 cost sharing ▪ P&L view: fully shown in Company P&L 2nd study for cisplatin-ineligible patients: Group incurs 100% of cost
Royalties	n/a	Group to pay industry-typical sales royalty to Debiopharm

¹ thereof up to ~€300 m for focus H&N indications)

² 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



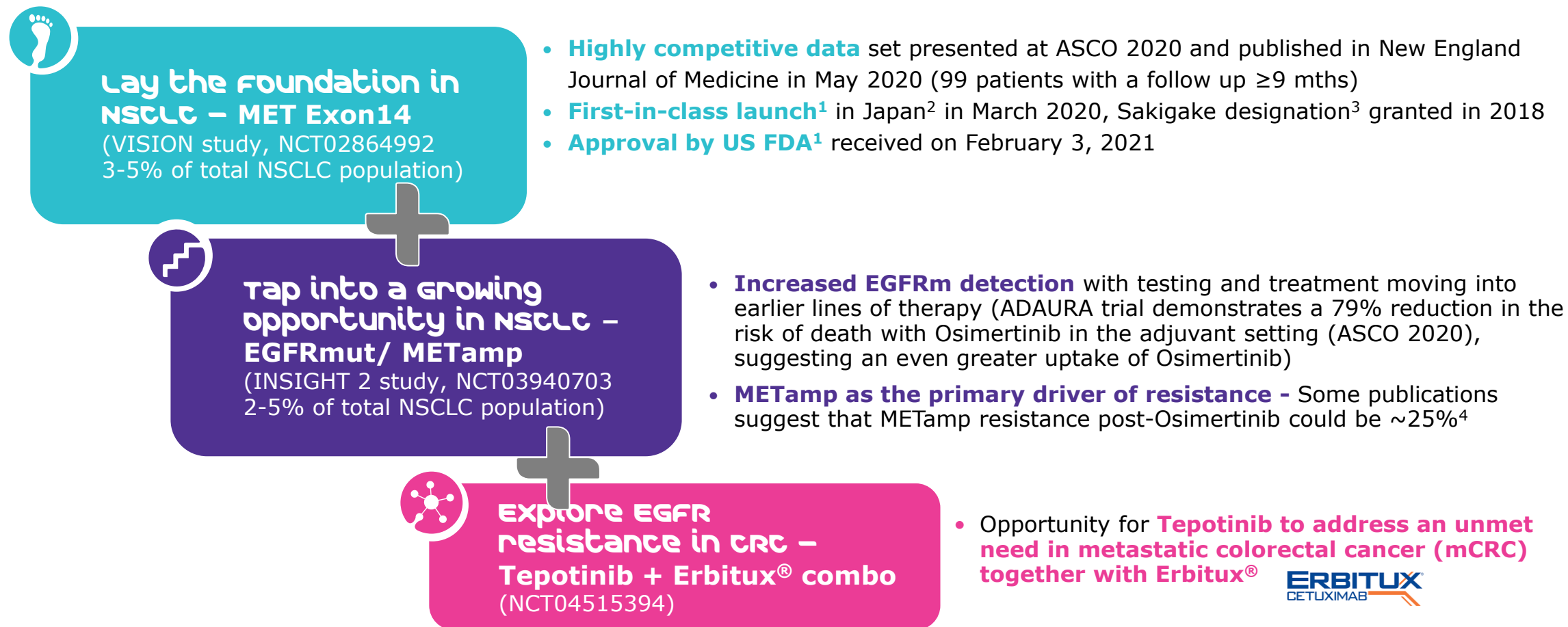
Blockbuster potential provided success of both studies



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



Recruiting

INSIGHT 2 – Tepotinib + Osimertinib in Osimertinib Relapsed METamp NSCLC

- **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%¹
- Estimated primary completion date: **November 2022**

Recruiting

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

- 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)²

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

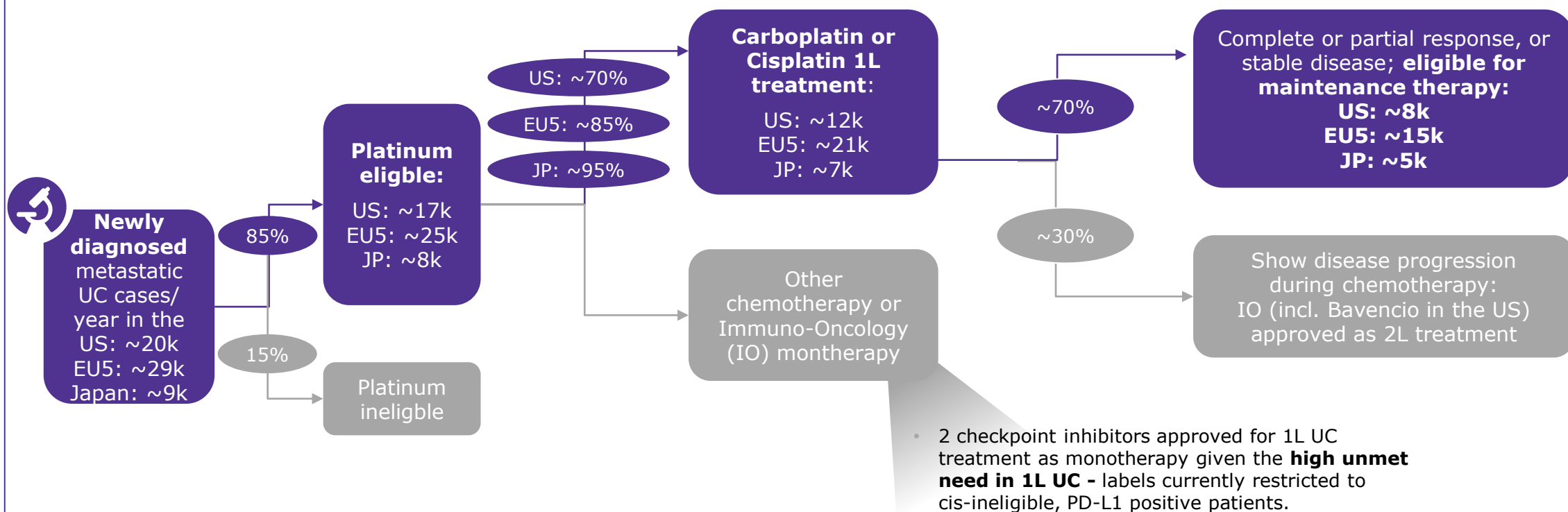
1: Piotrowska et al., "Landscape of Acquired Resistance to Osimertinib in EGFR -Mutant NSCLC and Clinical Validation of Combined EGFR and RET Inhibition with Osimertinib and BLU-667 for Acquired RET Fusion", AACR Cancer Discovery 2018; 2: Wu et al., "Long term outcomes to tepotinib plus gefitinib in 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 treatment¹



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

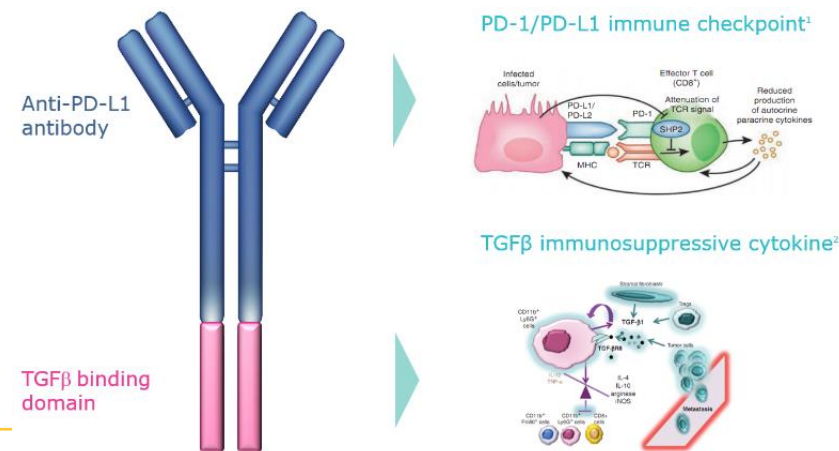
Bintrafusp alfa¹

An innovative first-in-class bifunctional fusion protein discovered in-house leading the TGF- β immuno-oncology field



Mode of action

- Innovative **first-in-class bifunctional fusion protein** designed to simultaneously target two immune suppressive pathways (blocking PD-L1 and reducing TGF- β signaling)
- Demonstrated **superior anti-tumor activity in pre-clinical study** compared to anti-PD-L1 alone, and anti-PD-L1 and TGF- β given in combination as separate agents
- **Great excitement in IO community** about M7824 uniquely addressing TGF- β 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**

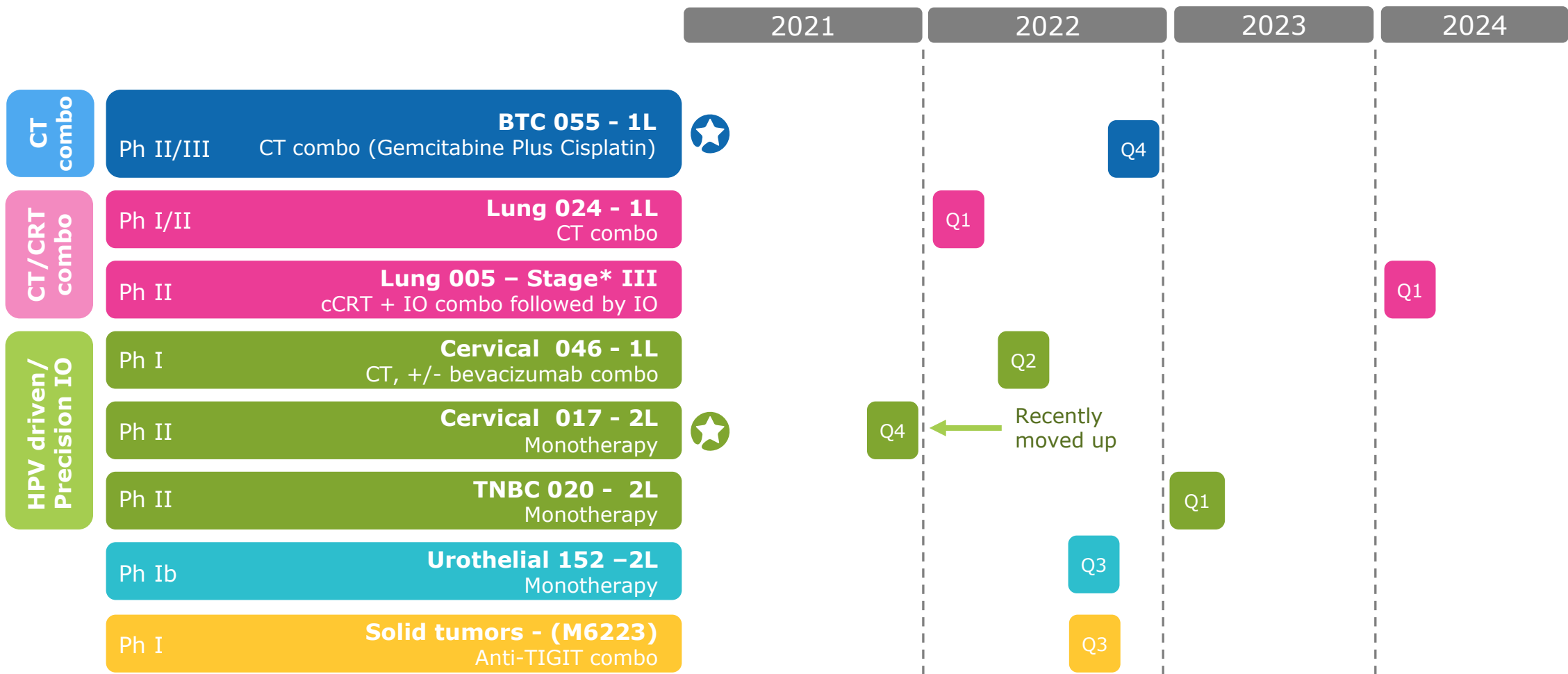
¹proposed International Nonproprietary Name (INN)

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

Bintrafusp alfa

INTR@PID Program: Upcoming Readouts

 Registrational potential

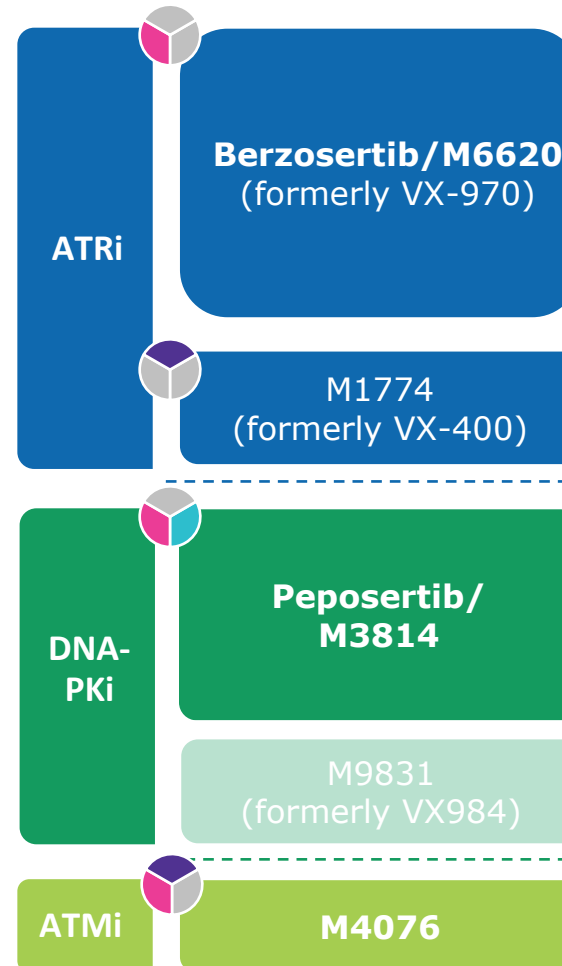
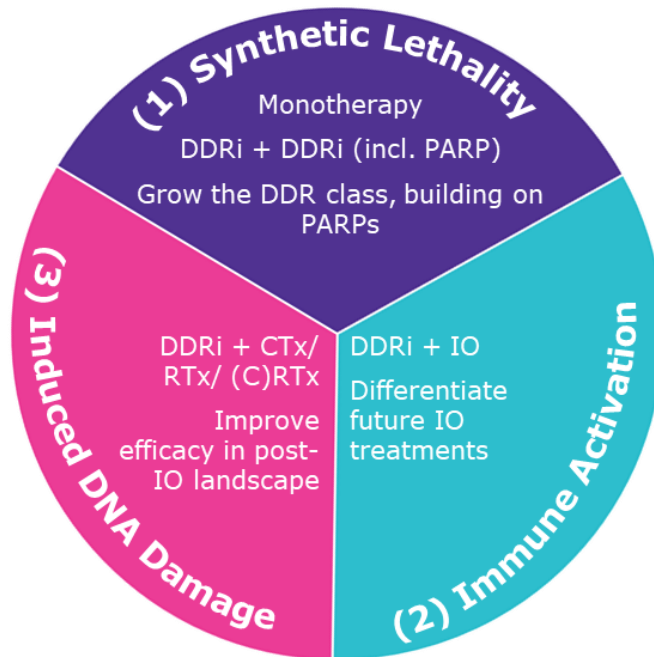


Acronyms: BTC = Biliary Tract Cancer; CT = Chemotherapy; EMT = Epithelial-mesenchymal transition; HPV = Human papillomavirus; NSCLC = Non-small Cell Lung Cancer; RT = Radiation therapy; TNBC = Triple-Negative Breast Cancer; * unresectable; **All clinical timelines are event-driven and may be subject 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 license¹ 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

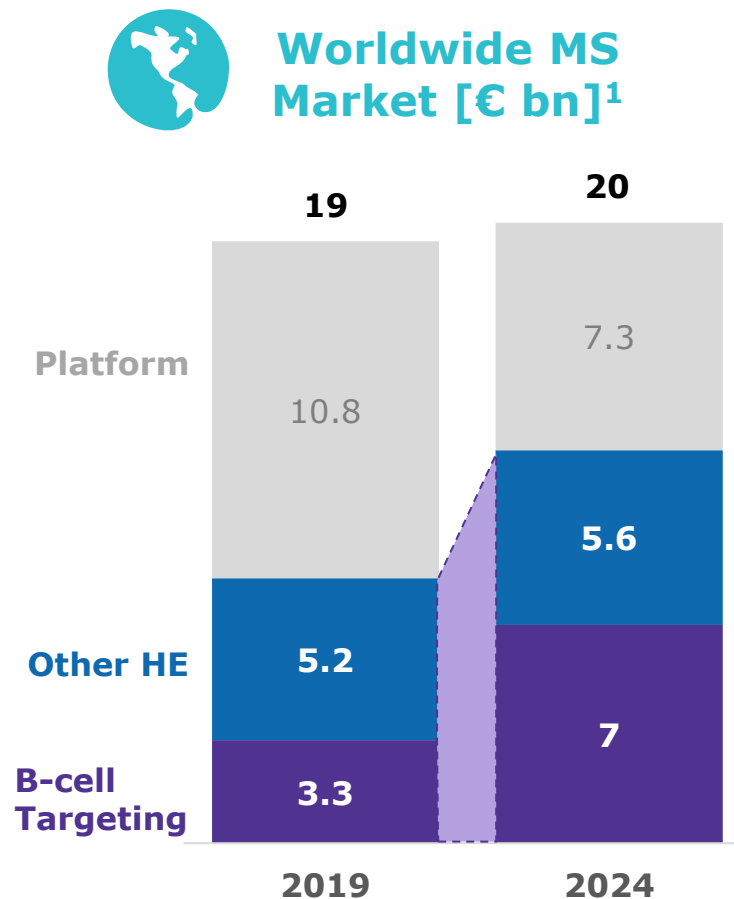


We pioneered BTKi development for MS with Evobrutinib

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 BTKi²
- ✓ **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* efficacy on relapses	✗	✗	✓ ⁽¹⁾
	Long-term* safety	✗	✗	✓ ⁽¹⁾
	Convenience (oral)	✓ BID	✓ QD	✓ BID
	Exposure in CSF	✗	✓ ^(2, ##) in HV	✓ ⁽³⁾ in MS
	Biomarker of inflammation and progression in MS patients (sNfL)	✗	✗	✓ ⁽³⁾
Preclinical data	BTK occupancy in the CNS	✗	✓ ⁽⁴⁾	✓ ⁽⁵⁾
	Efficacy in progressive EAE model and reduction of leptomeningeal inflammation[#]	✗	✗	✓ ⁽⁶⁻⁸⁾



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

✗ : not reported



Evobrutinib targets inflammation and progression

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

MOA on B-cells and macrophage/microglia cells is an **innovative oral approach to MS therapy** with potential to impact compartmentalized inflammation and progression

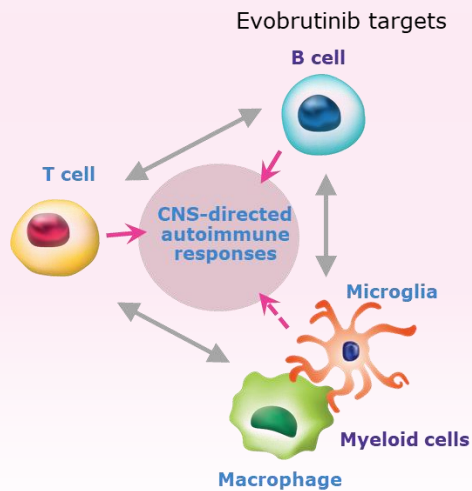
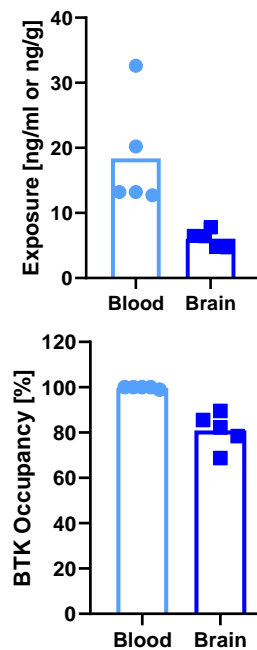


Figure modified from:
Li R, et al. 2018.

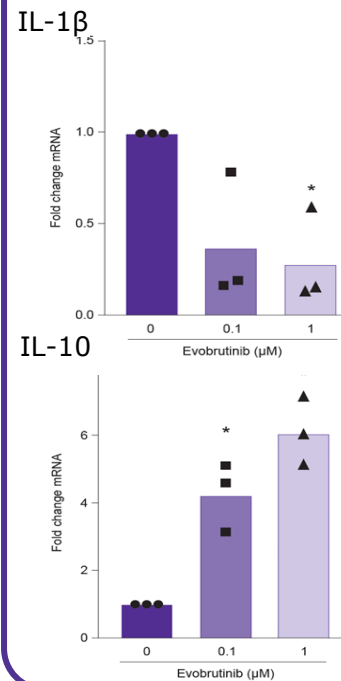
Evobrutinib is a CNS penetrant BTKi²

CNS exposure in EAE mice



Evobrutinib shifts macrophage phenotypes from M1 pro- to M2 anti-inflammatory³

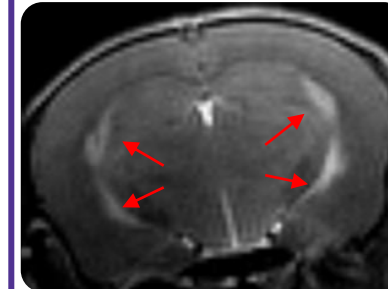
Macrophages after GM-CSF activation



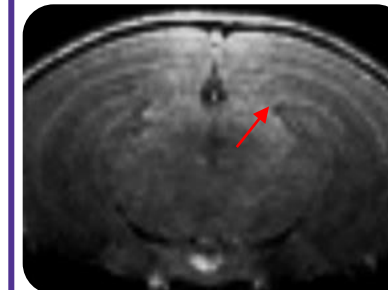
Evobrutinib reduces CNS B cells and leptomenigeal inflammation⁴

Leptomeningeal structures

Vehicle:



Evobrutinib:



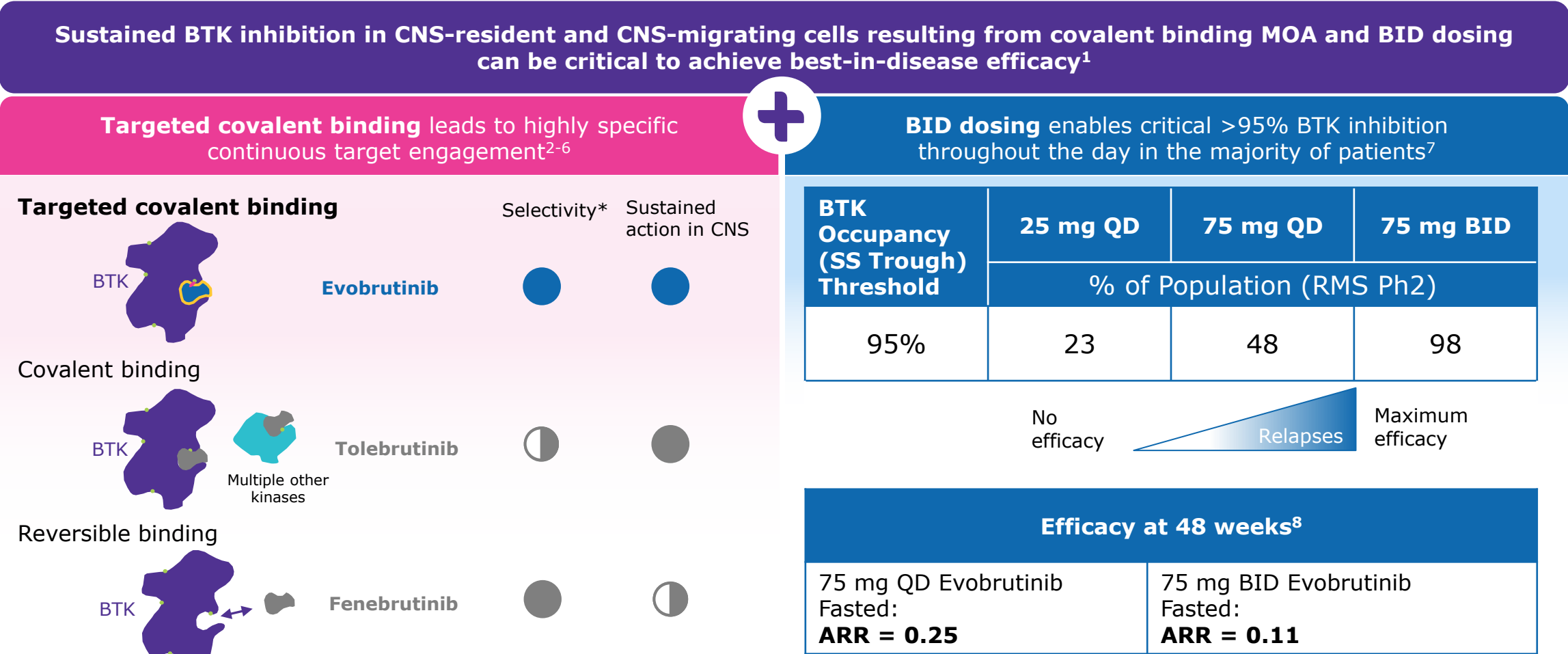
EAE in SJL/J mice

- Important role of macrophage/microglia cells in addition to B and T cells in both **periphery and CNS**¹
- Evobrutinib **reaches brain** to potentially impact compartmentalized inflammation²
- Effects may be mediated through effects on **CNS-resident and CNS-migrating cells**^{3,4}

1. Li et al. Nat Immunol 2018; 2. Adapted from Boschert U et al.ECTRIMS-ECTRIMS 2017; 3. Alankus YB et al.ECTRIMS 2018; 4. Sol KimECTRIMS 2020

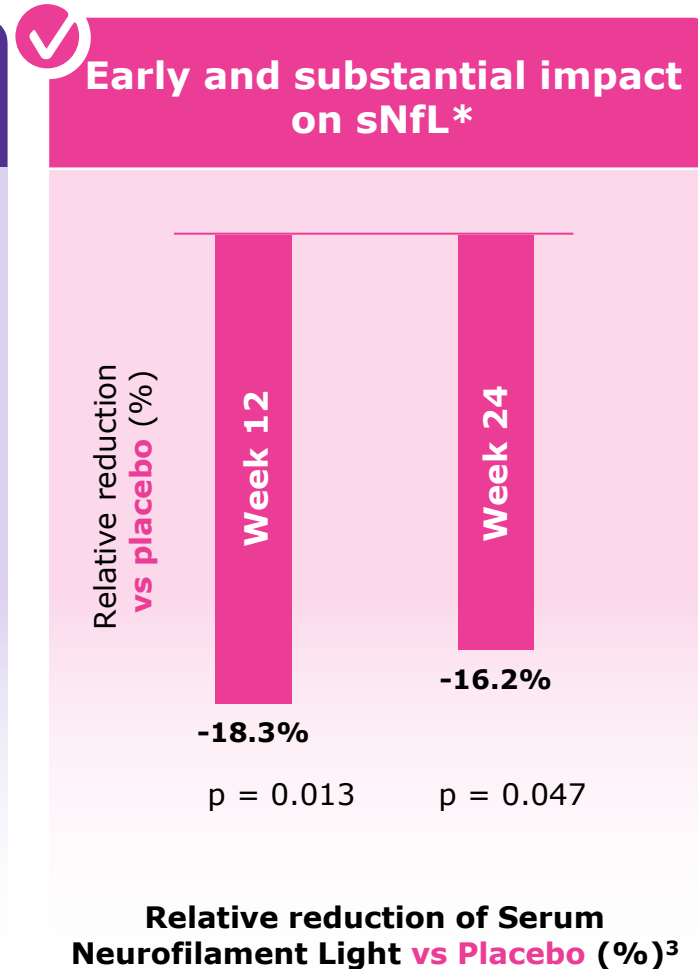
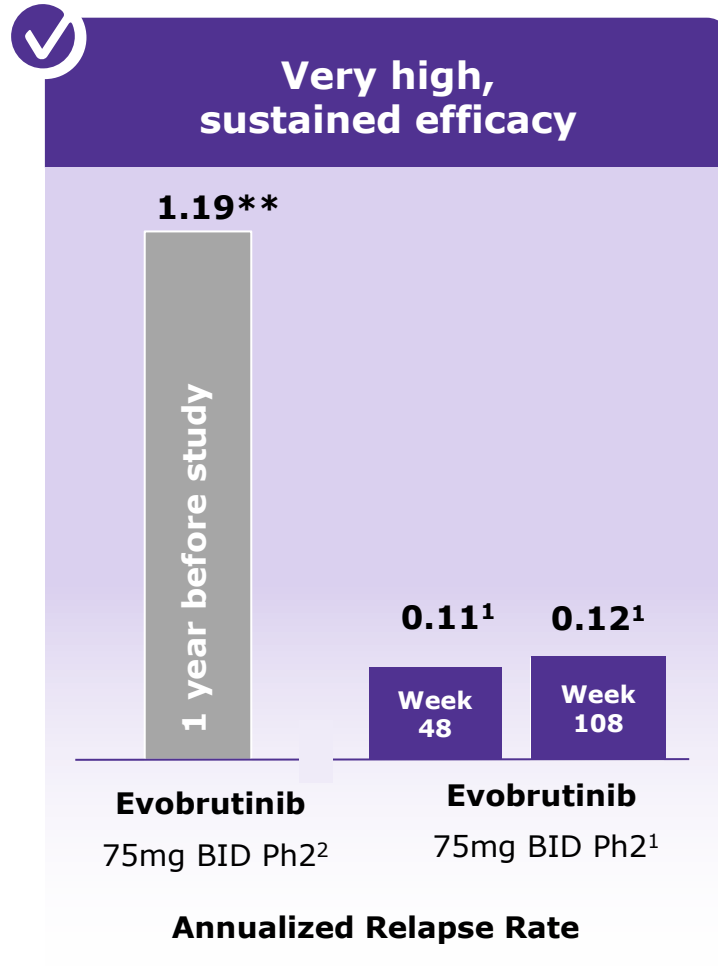
Evobrutinib is optimally dosed to offer best-in-class BTK inhibition

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



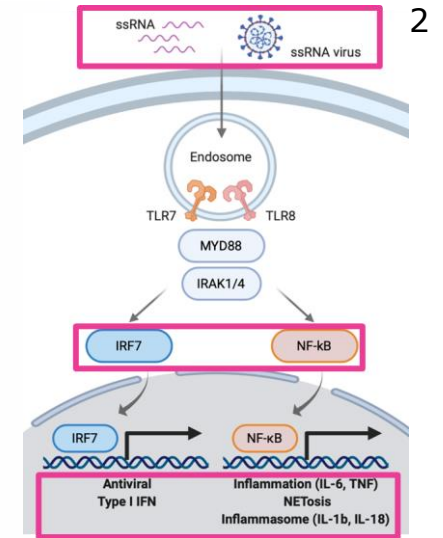
- Evobrutinib is the **only BTKi to have demonstrated very high, sustained efficacy and favorable safety** in the largest Phase II study in MS (n=267), with an ARR of confirmed relapses of 0.12 up to 108 weeks¹
- Evobrutinib **impacts sNfL levels**, a biomarker of neuronal damage, reflecting **disease 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 Action¹

- 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)¹

- **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



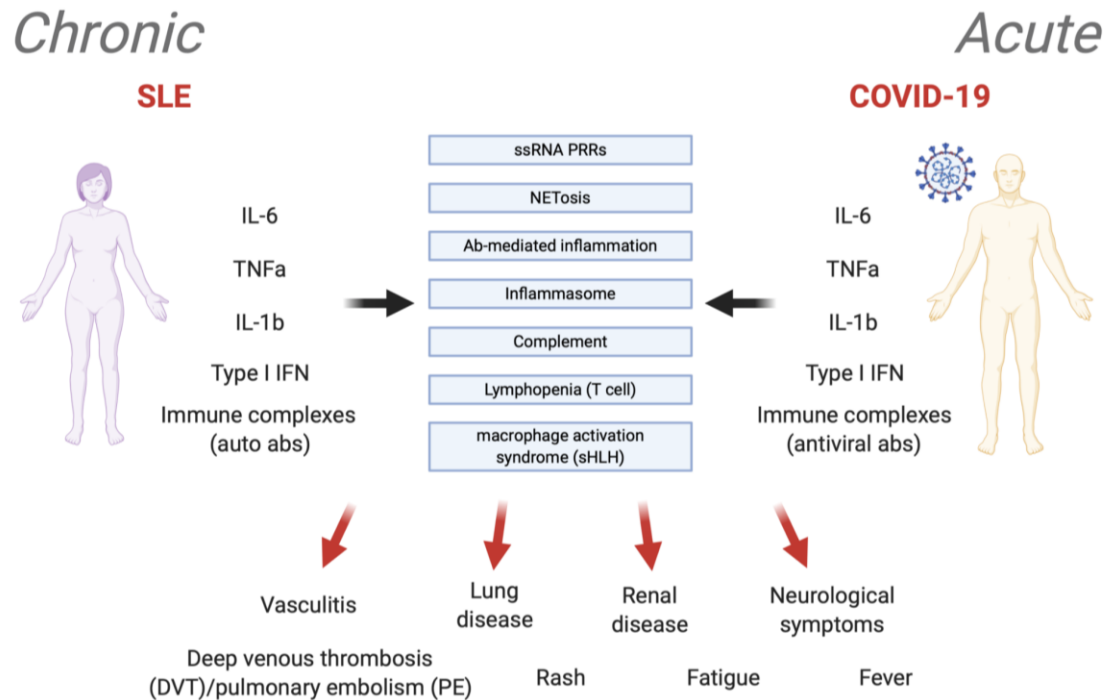
Preliminary Phase I data warrant further investigation as a potential treatment for autoimmune diseases including SLE

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-19¹



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

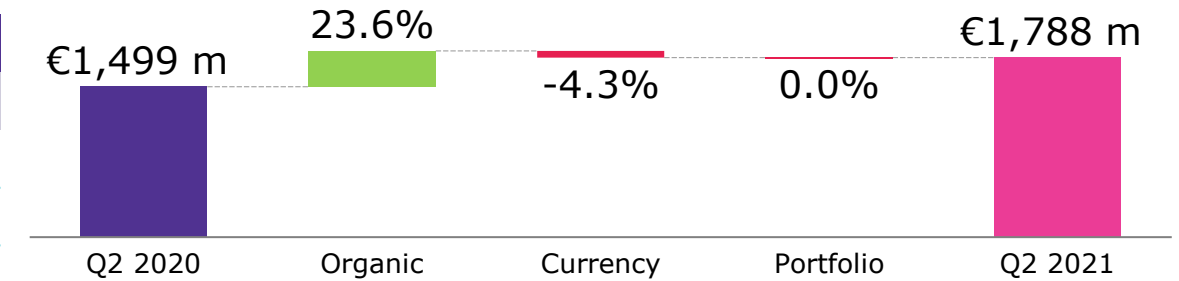
Healthcare P&L

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

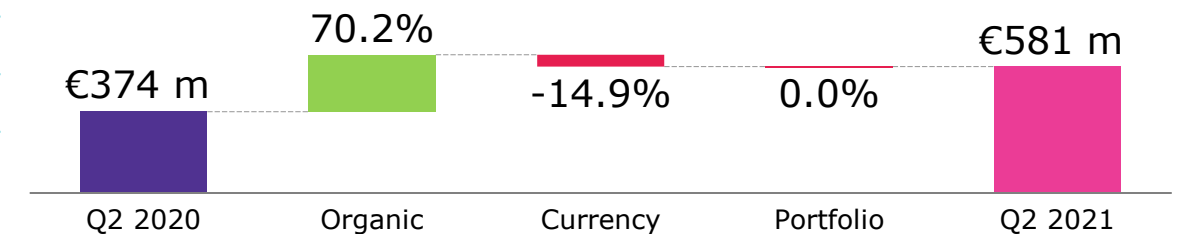
Comments

- 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 VBP¹ 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



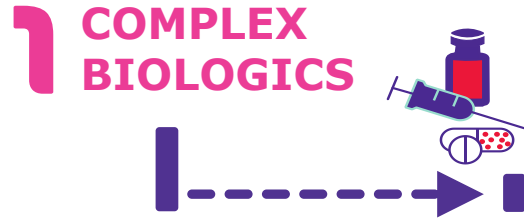
EBITDA pre bridge





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 Science¹

- **>90%** of
Millipore products on
eCommerce platform
- **x2** net sales growth
of eCommerce vs.
non-eCommerce²



Manufacturing/Distribution
Nantong, Wuxi Single use

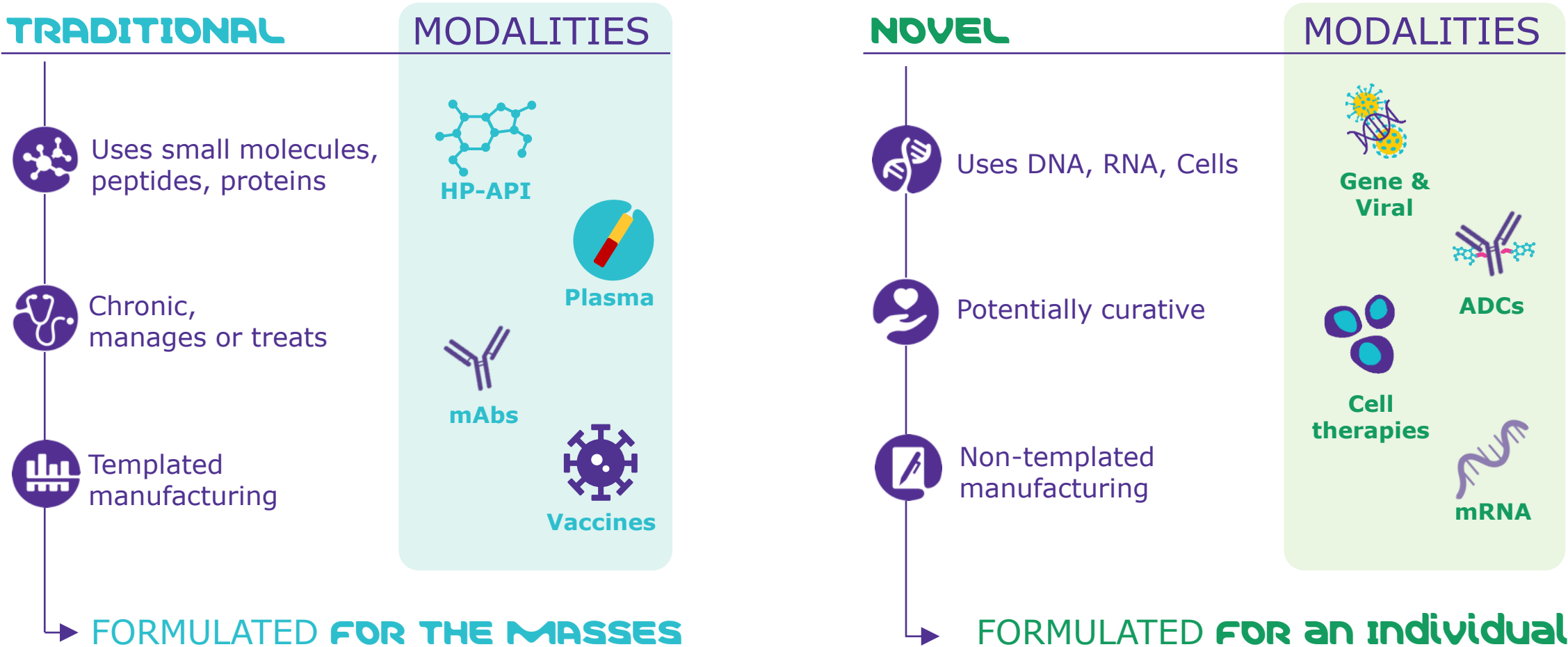
Commercial expansion
Tier 2 cities

eCommerce partnership



Process Solutions: Therapies are evolving from treatments to cures





Advancing traditional is critical as novel modalities develop



Acronyms: HP-API = highly potent active pharmaceutical ingredient; mAbs = monoclonal antibodies; DNA = deoxyribonucleic acid; (m)RNA = (messenger) ribonucleic acid; ADC = antibody drug conjugate



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

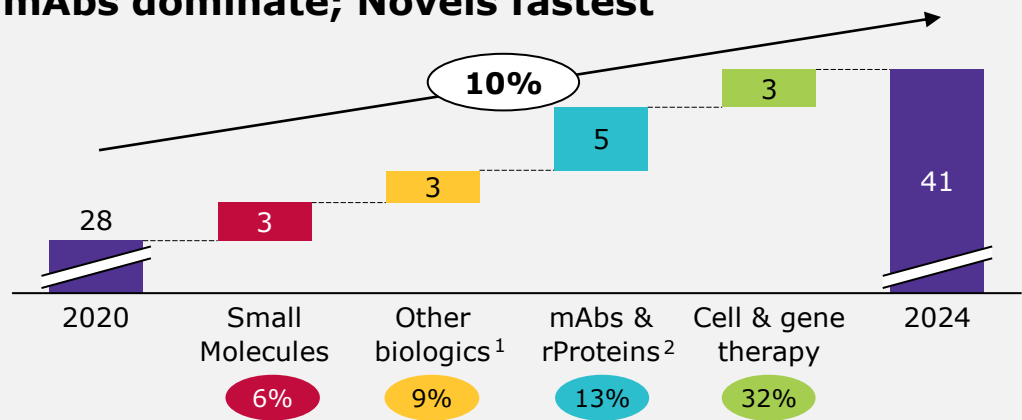
Leveraging **human factory**

- Emerging manufacturing processes
- Lipids are critical

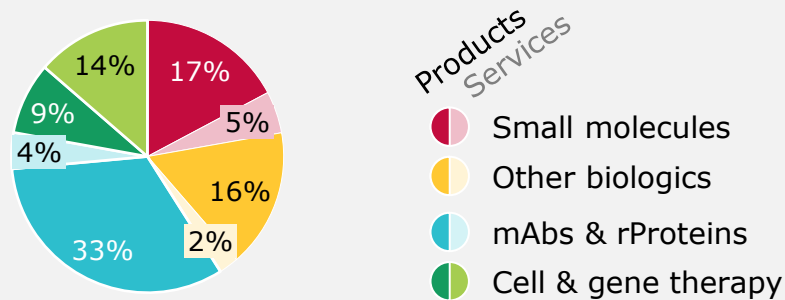
Opportunities in services to accelerate double-digit growth

Accessible Market (€ bn)

mAbs dominate; Novels fastest



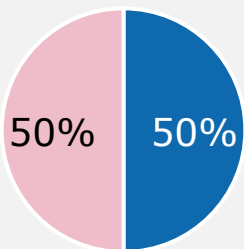
Service importance varies by modality



Origins of biologics pipeline

Emerging biotechs drive novels

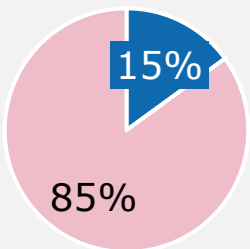
Traditional therapies



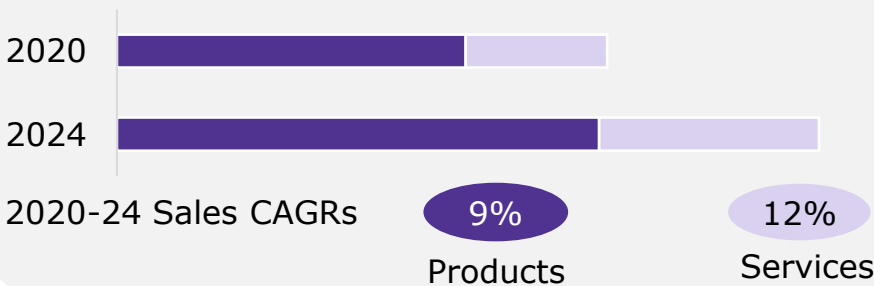
Company type

- Established
- Emerging

Novel therapies



Services see faster growth in coming years



Sources: Evaluate Pharma, internal market models, CSR sales data; ¹ Other biologics include plasma, vaccines, insulin, microbial and non-mAb biosimilars; ² 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

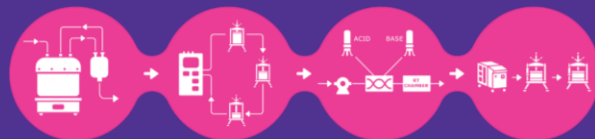
Next-generation bioprocessing on the cards

Today's
process & portfolio



Tomorrow's
process

MAb process intensification 2017 - 2020+



continuous processing >2025

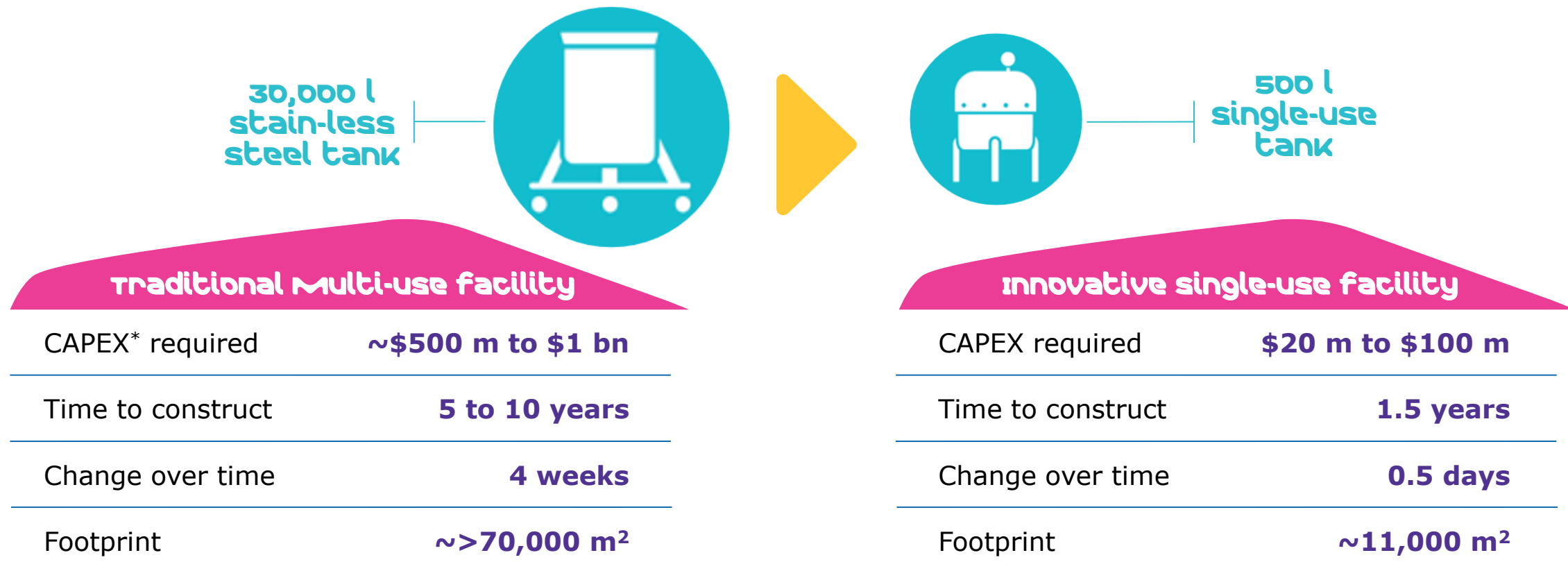


Continuous bioprocessing will ...

- 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

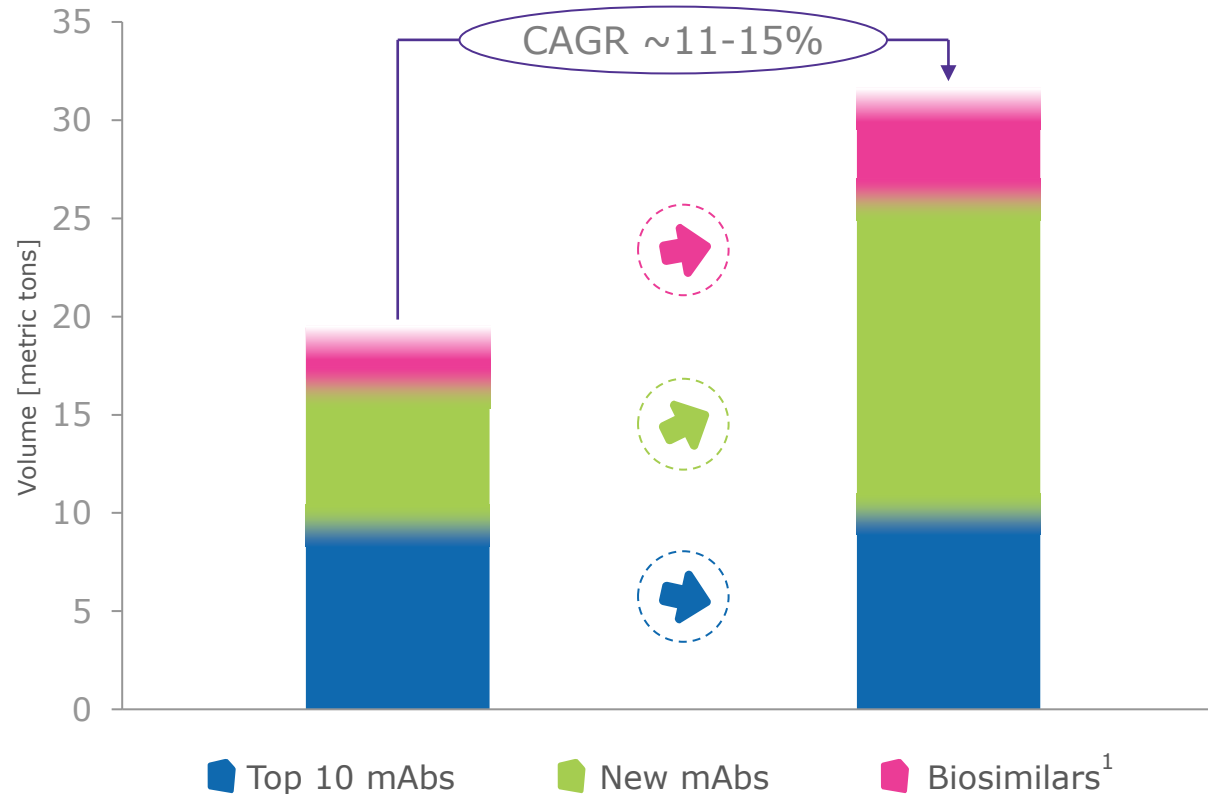


Strong demand for single-use technologies and Process Solutions' broad offering was and will remain a key source of growth for Life Science



mAbs market democratization will drive diversification, change & variability

mAb volume projections 2020 to 2024



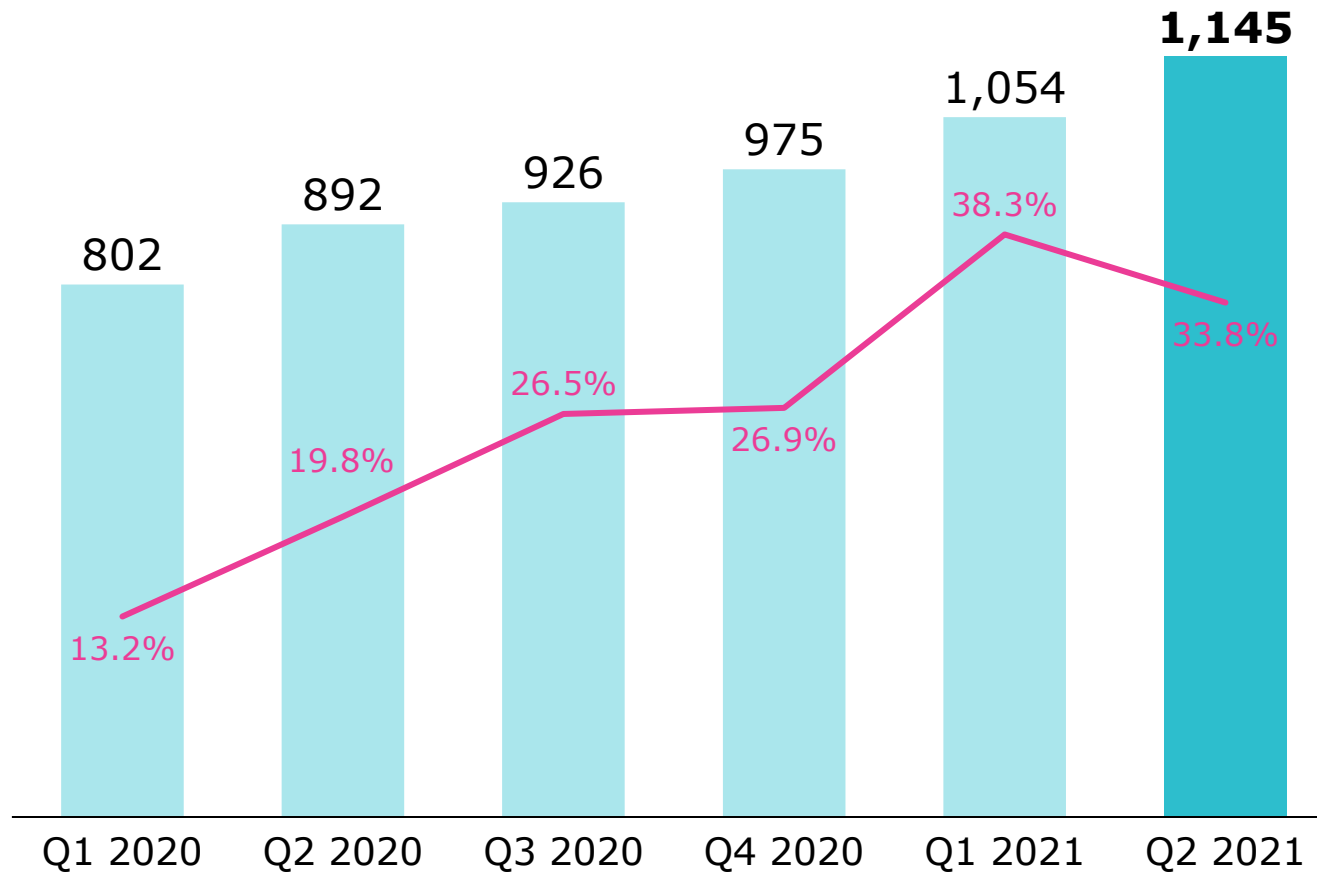
¹Biosimilars scaling factor = 2.8 based off internal estimates and McKinsey analysis;
Source: company estimate based on industry forecasts, EvaluatePharma; mAbs = Monoclonal antibodies

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 [%]

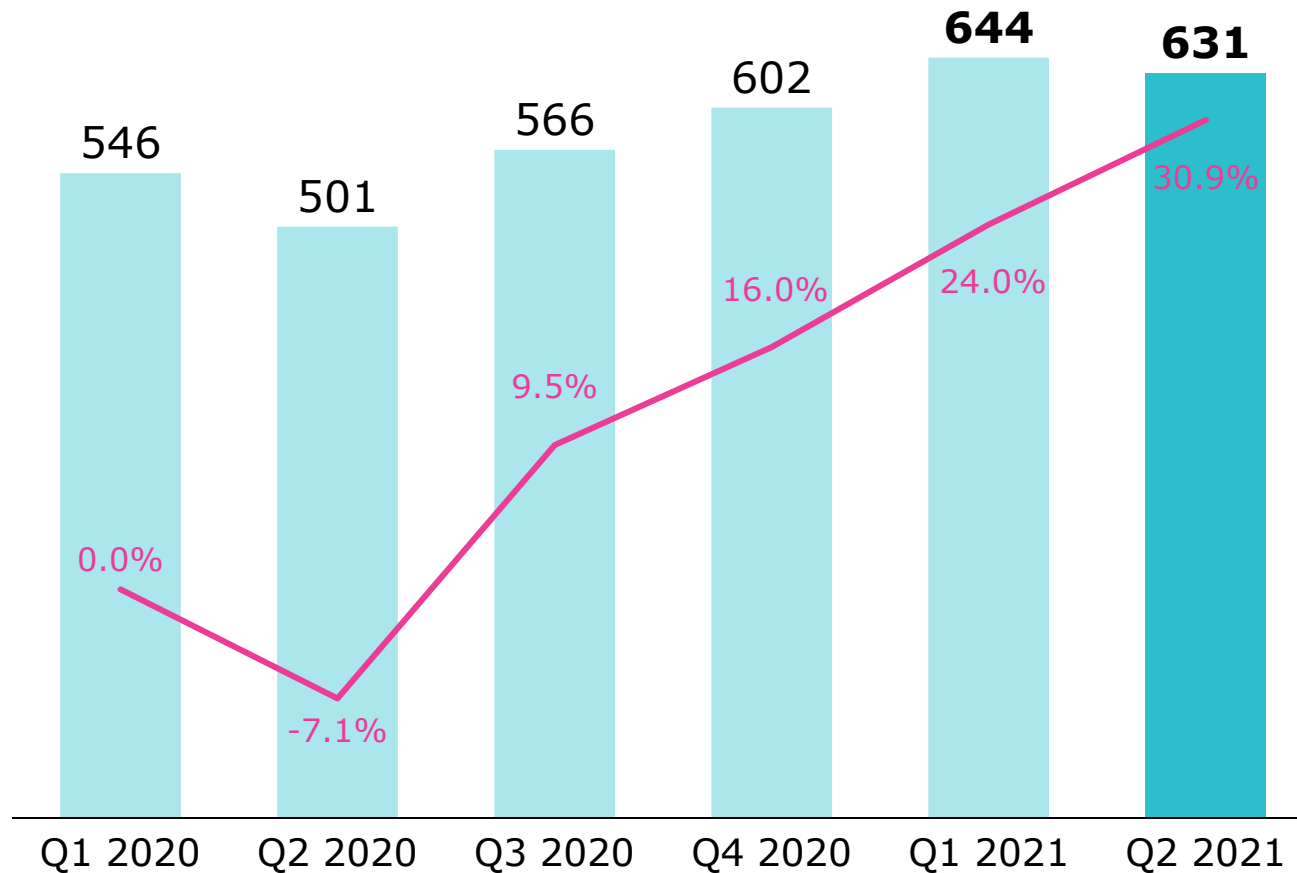


- Continued **double-digit growth in the core business** paired with **rising COVID-19 contributions** (mainly vaccine related)
- **BioP as main growth driver**, formulation growing fastest, services also strong
- **Growth starting to moderate** as expected **amid rising comps** (Q2 2020 with initial 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 [%]

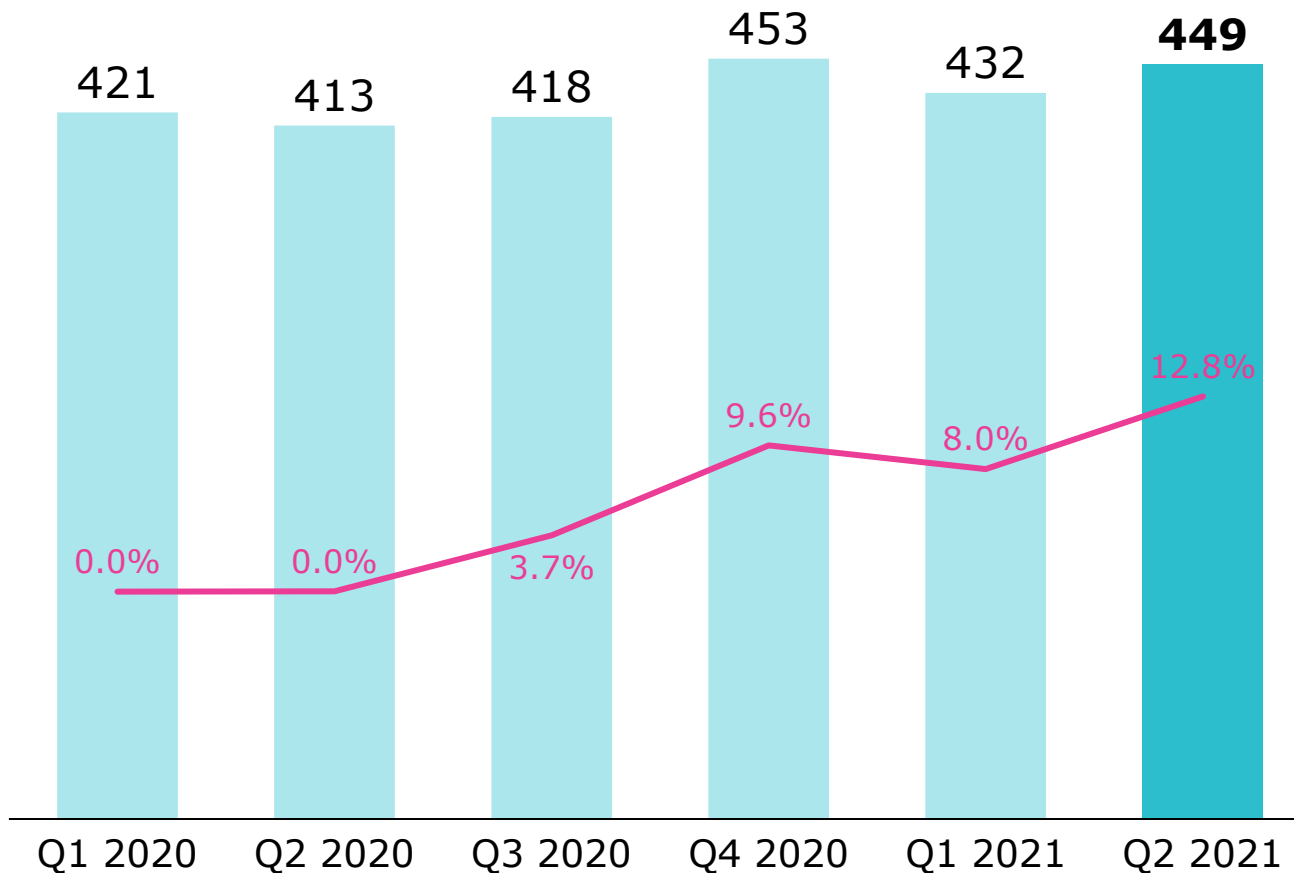


- Strong **double-digit growth, accelerating further** on soft comps (Q2-20 with biggest impact from lockdowns)
- Ongoing **core business recovery** and catch-up amid **rising lab activity**
- Diagnostics related **COVID-19 tailwinds continue albeit slowing** as expected
- **North America as fastest 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

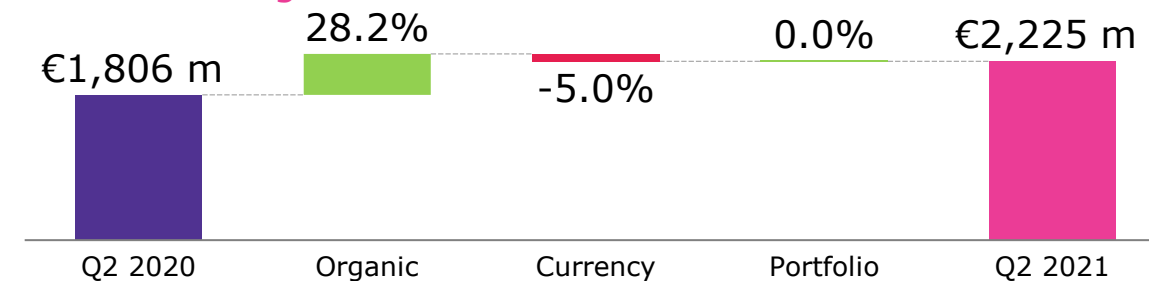
Life Science P&L

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

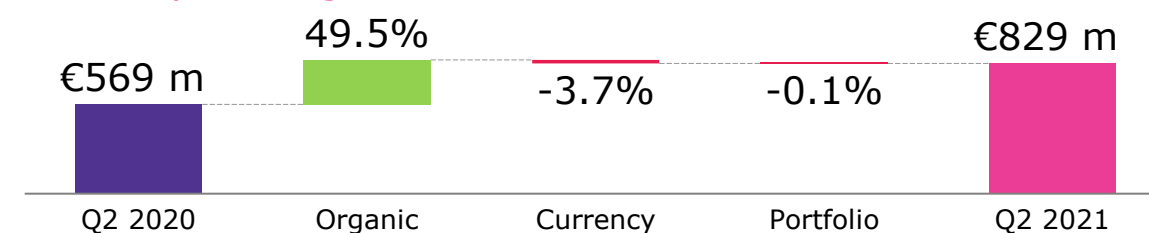
Comments

- 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

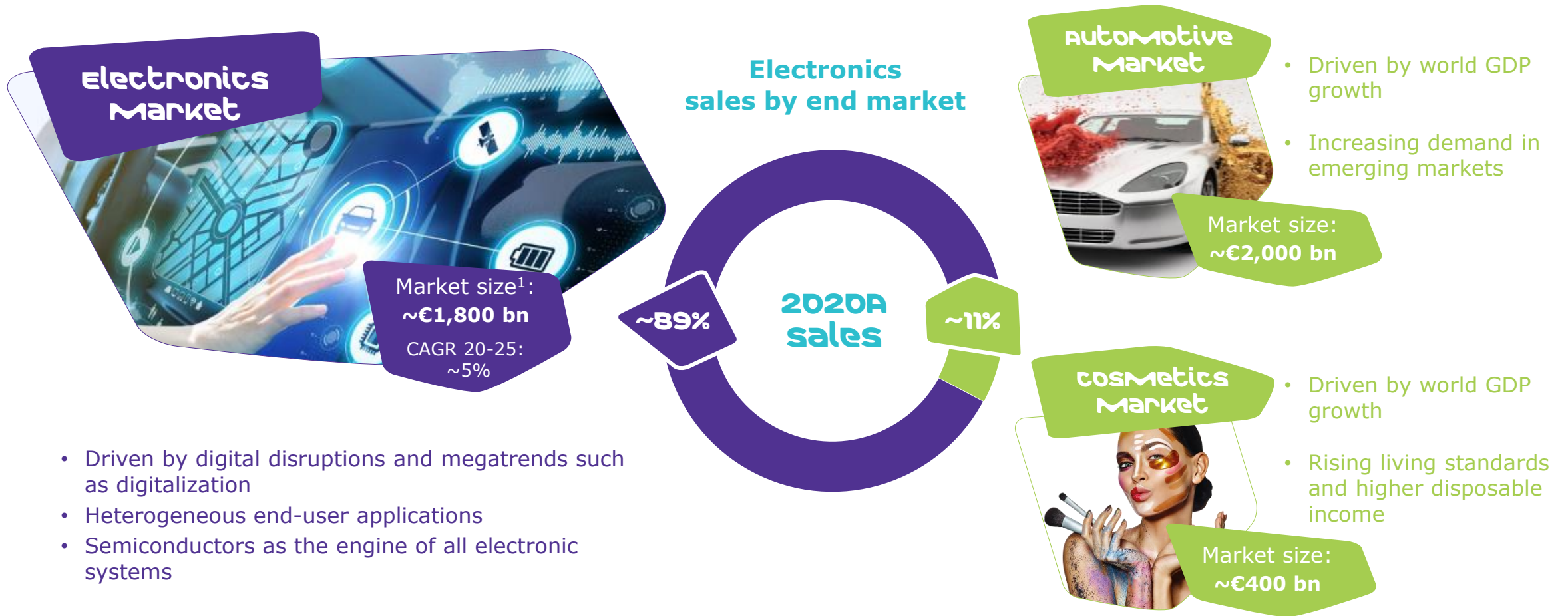




electronics

Electronics

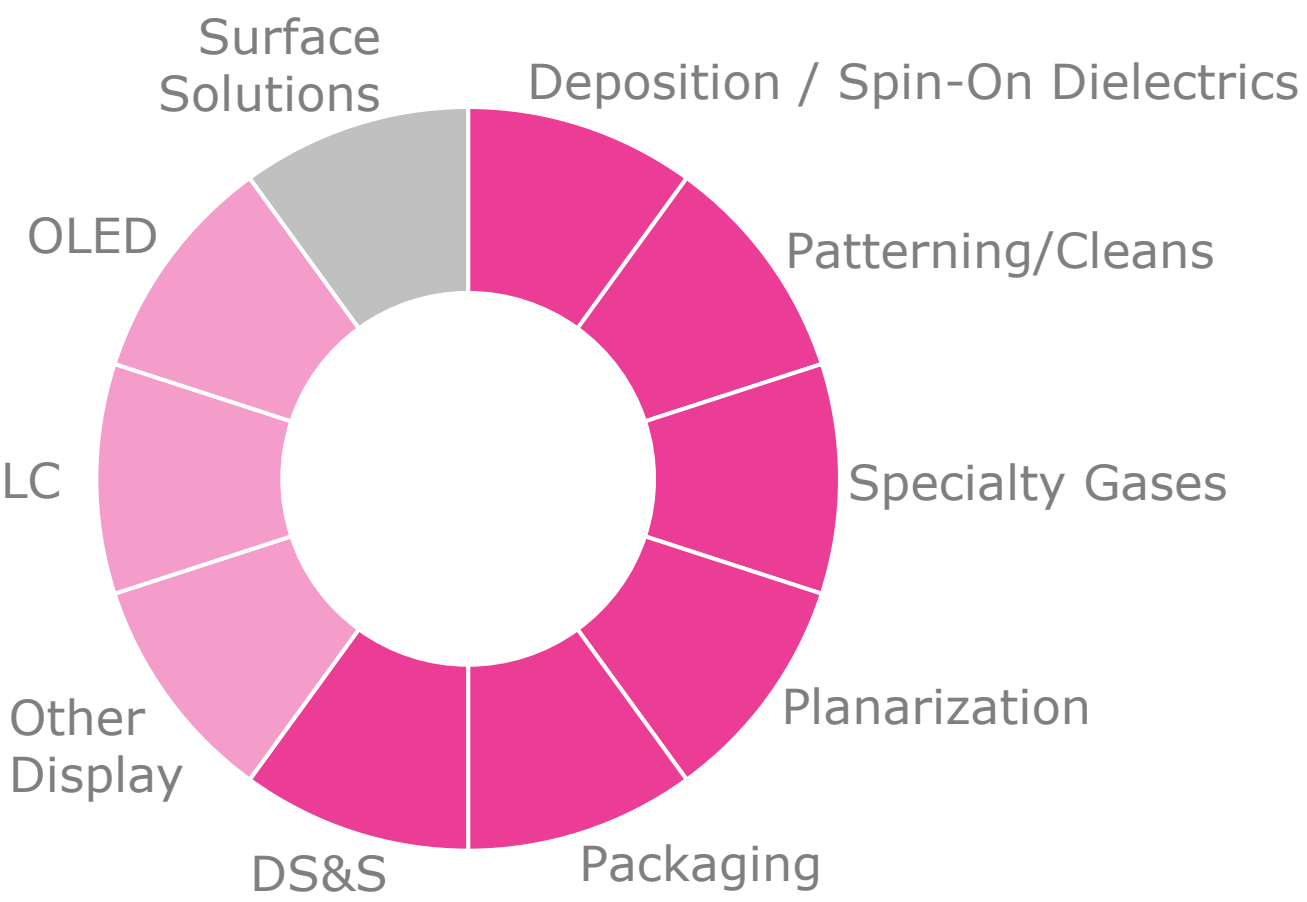
Targets attractive markets – especially in the electronics space



¹Prismark 2021

Electronics

Expected mid-term portfolio split



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

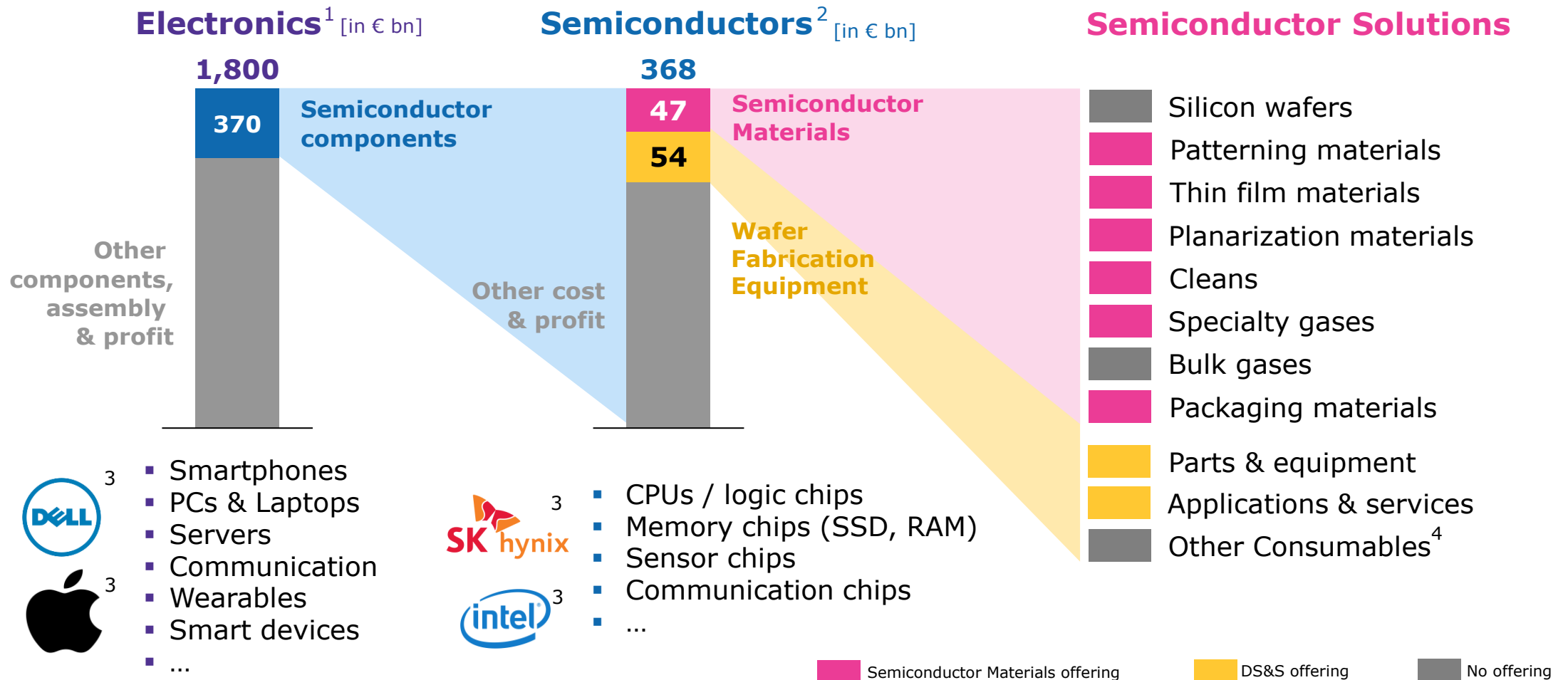
>60% of them **serving chip makers**

INDICATIVE Chart

Semiconductor Solutions Display Solutions Surface Solutions



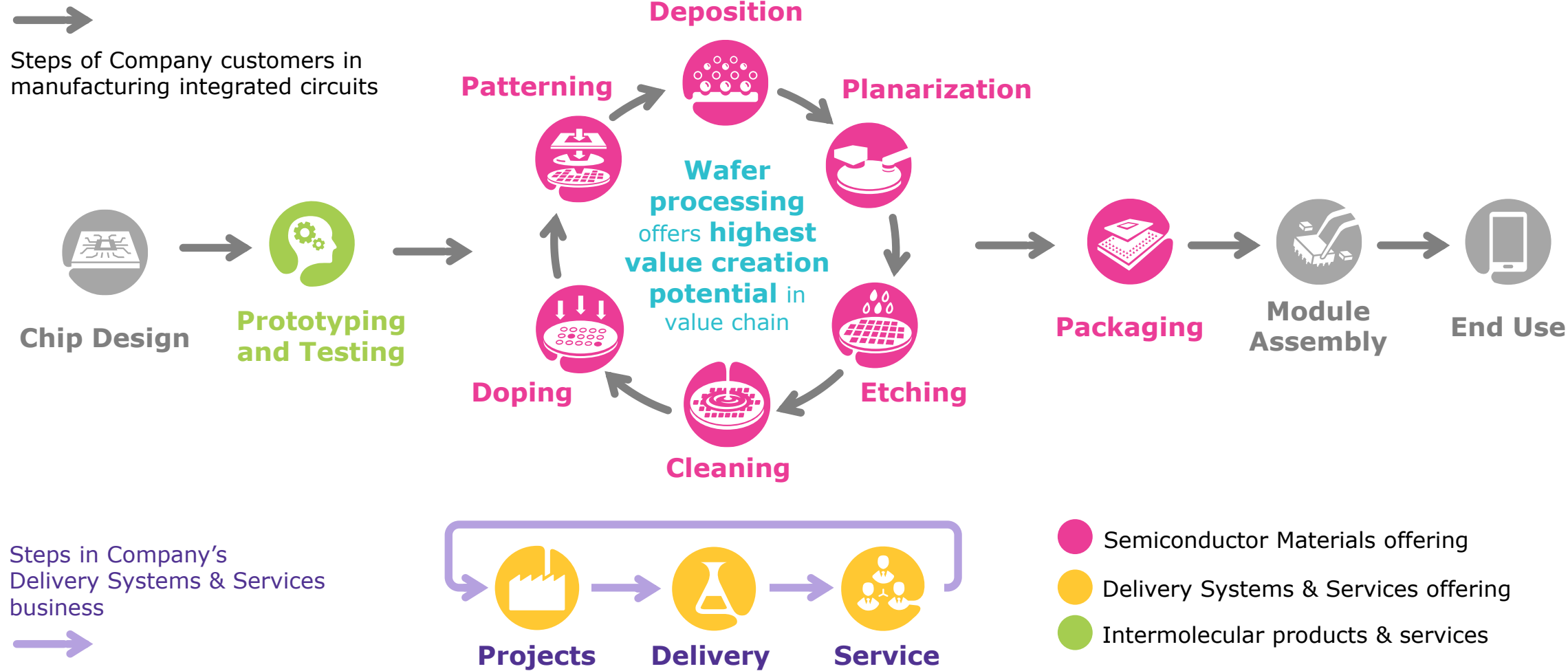
Semiconductor Solutions – **integrated materials player, well positioned to serve the need of customers in semiconductor fabrication**



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

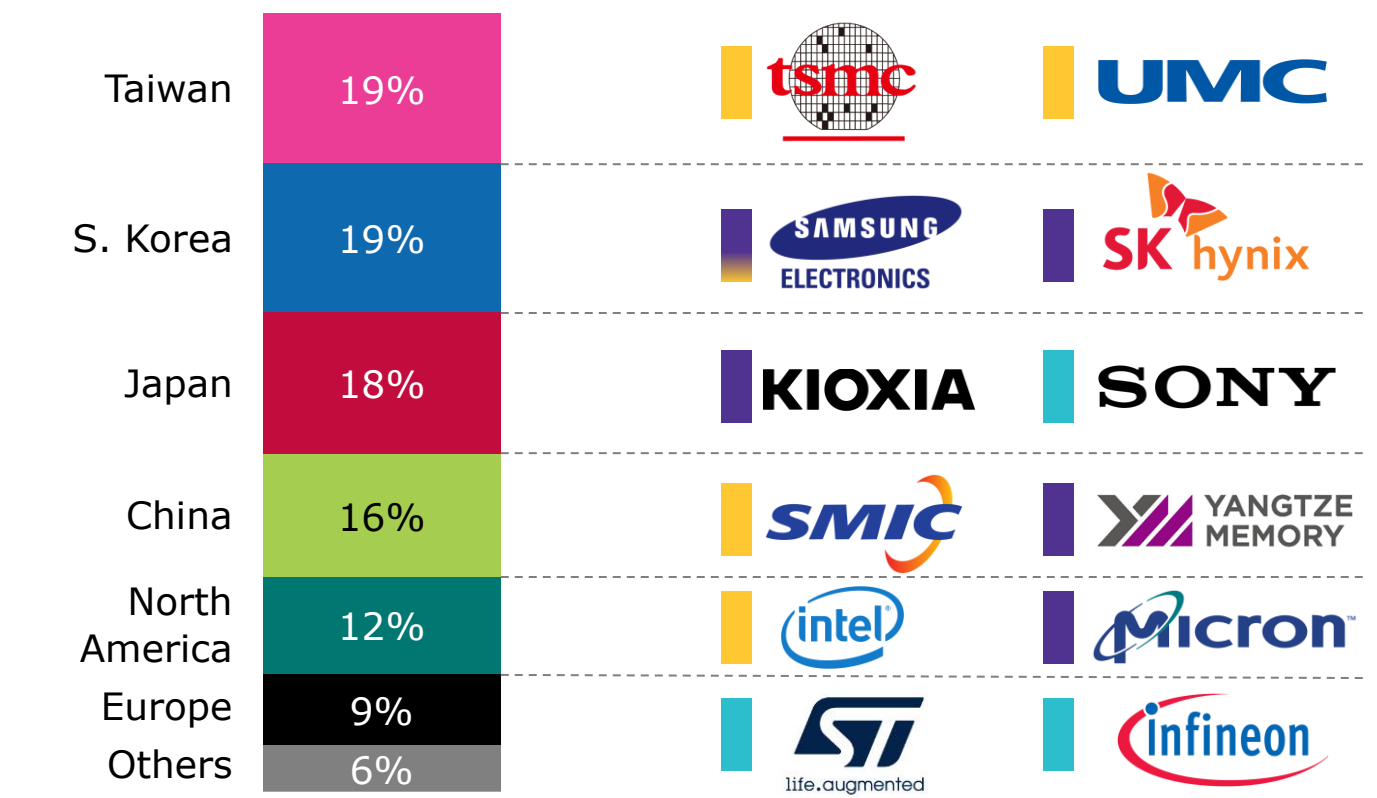
⁴e.g. Filters, Pads, etc.; CPU = Central Processing Unit; RAM = Random Access Memory; SSD = Solid State Disk; CMOS = Complementary metal-oxide semiconductor

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



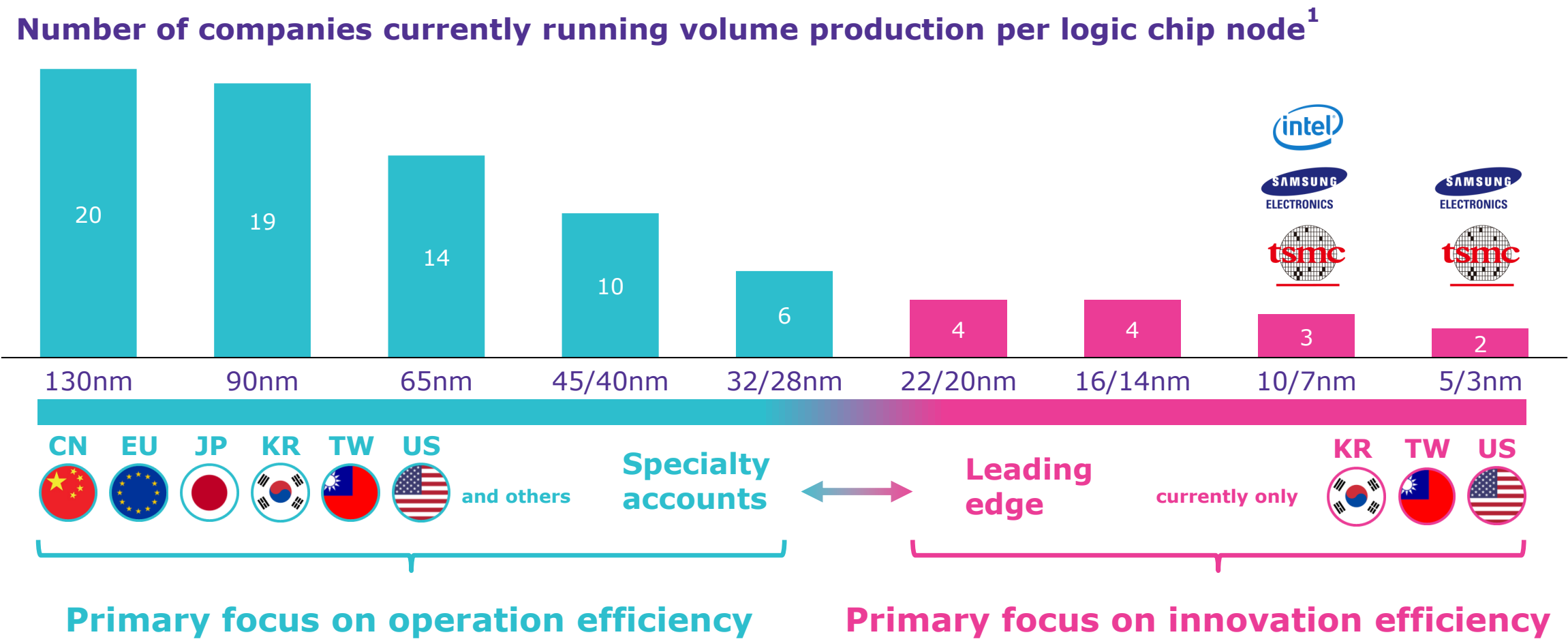
Beyond a comprehensive portfolio Semiconductor Solutions also has an industry spanning customer base, supplying various end markets

2019 wafer capacity by region¹ Selected customers per region²



Semiconductor Solutions has **OVER 100 customers** supplying all top 10 chip makers and virtually all of the top 100³

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

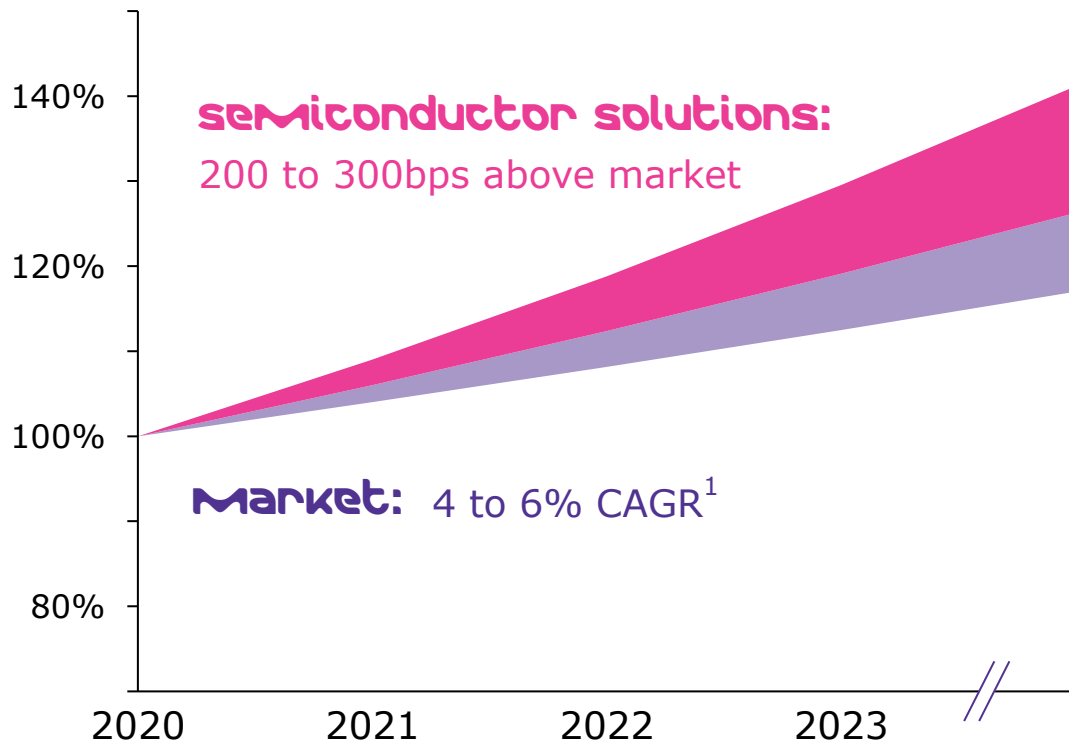


Semiconductor Materials

Set to outgrow highly attractive semiconductor materials market

Semiconductor Solutions sales guidance vs. market

[Indexed 2020 = 100%]



¹Source: 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**

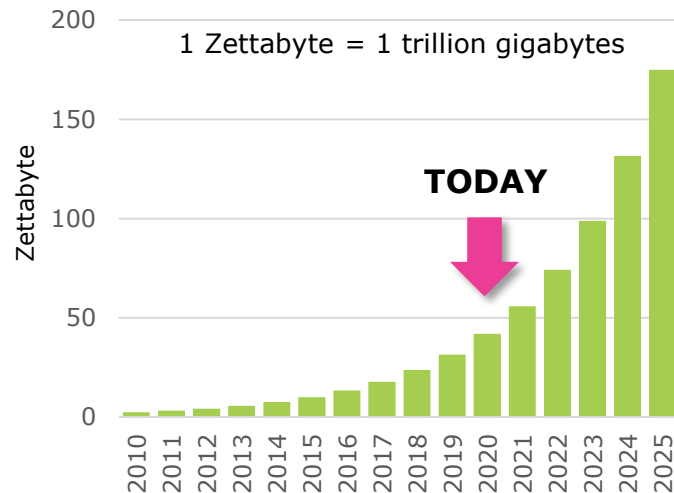
Technology trends inevitably drive exponential data growth... ...more chips needed to generate, transfer, process & store data

Data created worldwide
is growing +30% annually

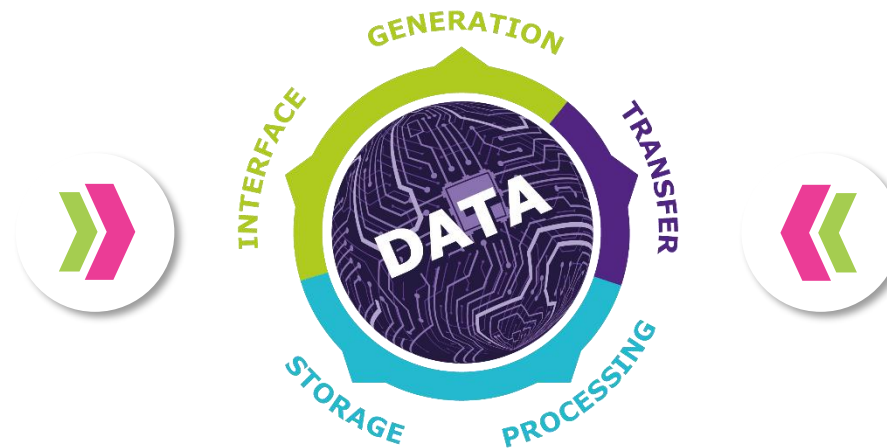
All segments of data application
are affected by global data growth

Technology trends strongly impact
relevance of data application segments

Size of global data sphere



Source: IDC DataAge 2025 Whitepaper



Technology market growth - examples

5G Technology¹
>122% CAGR

Artificial Intelligence²
>33% CAGR

IoT Sensors³
>24% CAGR

Data Center Services⁴
>13% CAGR

Autonomous Driving⁵
>18% CAGR

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

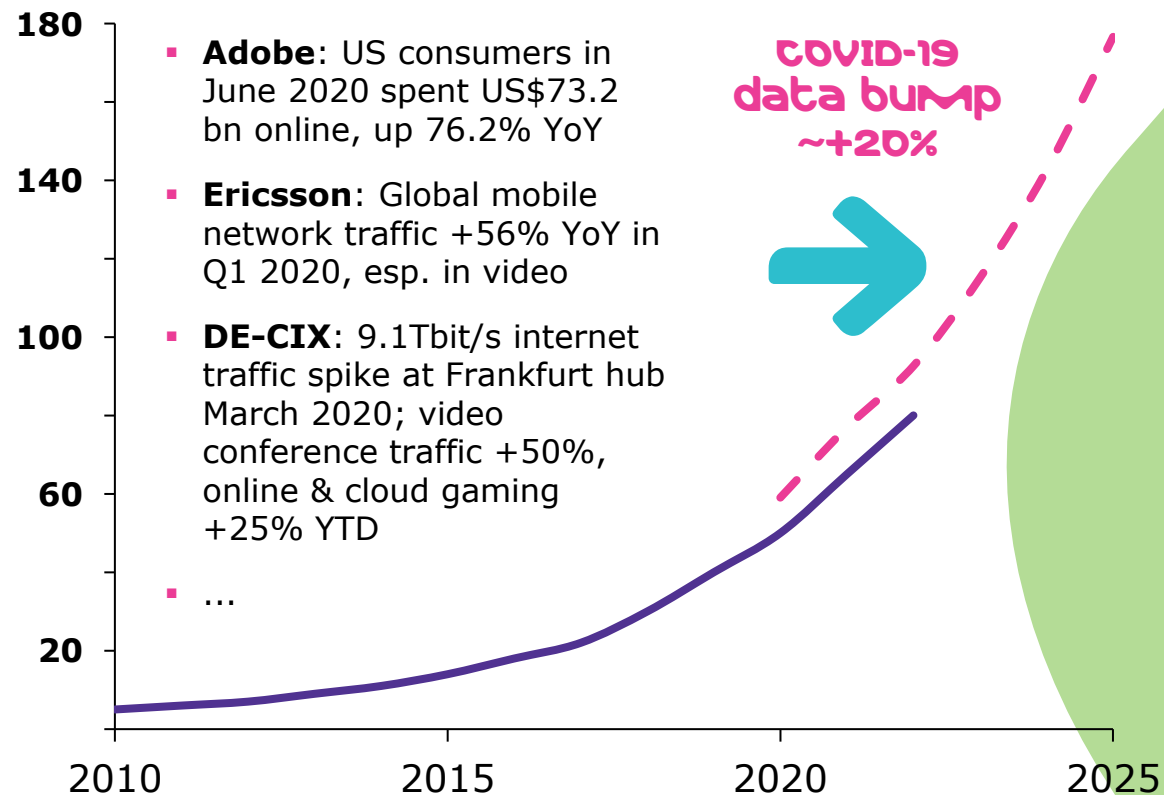
1) [alliedmarketresearch.com](https://www.alliedmarketresearch.com), Prismark 2020, CAGR 2021-2026; 2) [fortunebusinessinsights.com](https://www.fortunebusinessinsights.com), [post-gazette.com](https://www.post-gazette.com), CAGR 2018-2026; 3) [mordorintelligence.com](https://www.mordorintelligence.com),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

4) [mordorintelligence.com](https://www.mordorintelligence.com), Prismark 2020; CAGR 2020-2025; 5G = 5th-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 years¹

Expected COVID-19 impact on global datasphere² [zetabytes]



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

²Source: Seagate, IDC April 2020, Merck KGaA, Darmstadt, Germany

COVID-19 impact on data growth expected to be positive

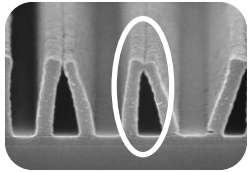
- 1
 - Work-from-home/stay-at-home economy
 - Significant increase in video conferences, online shopping, online gaming, streaming
- 2
 - Change in consumers’ and enterprises’ digital behavior expected to be long-lasting
- 3
 - Need for more, faster & more reliable data processing, storage and bandwidth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

semiconductor solutions stands ready to support increased demand

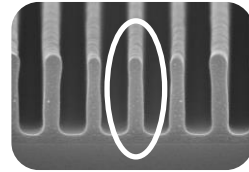
Electronics

Expanding the limits of how small you can go

Pattern collapse

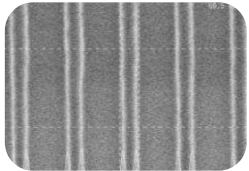


AZ® rinse materials



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

Lithography limitation

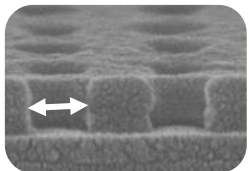


Directed self-assembly (DSA)

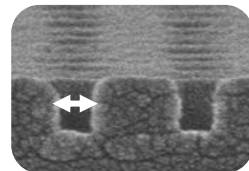


Block copolymer can generate small lines or contact holes by self-assembly. This allows miniaturization without expensive new equipment.

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

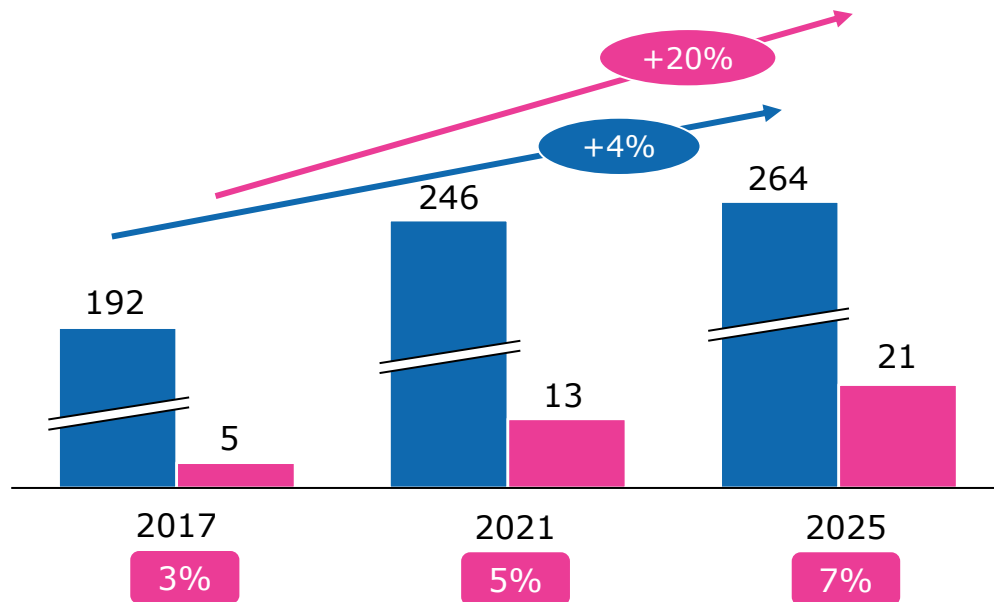


Electronics

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

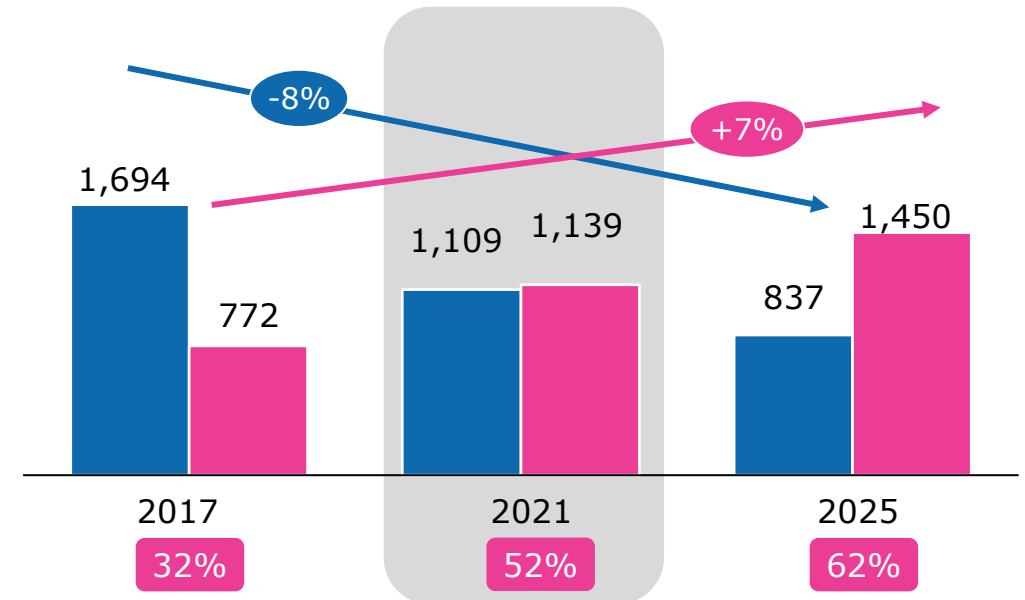
x% OLED shipment area / addressable material market [in % of total] Liquid Crystals OLED

Display shipment area¹
[km²]



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

Addressable material market²
[€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**

¹Omdia; ²Internal 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

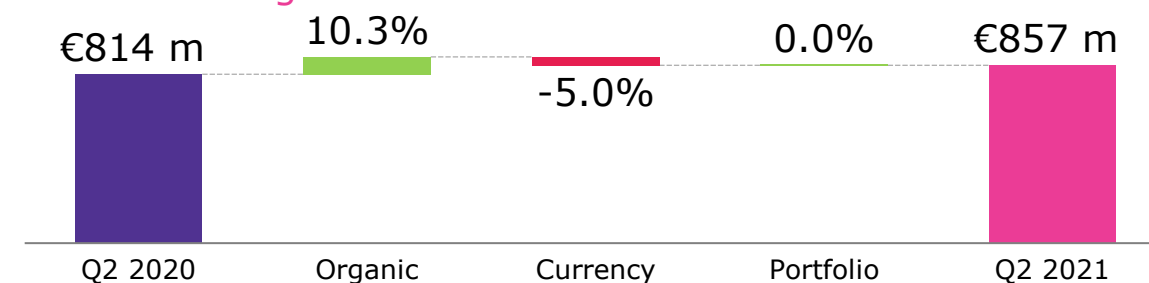
Electronics P&L

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

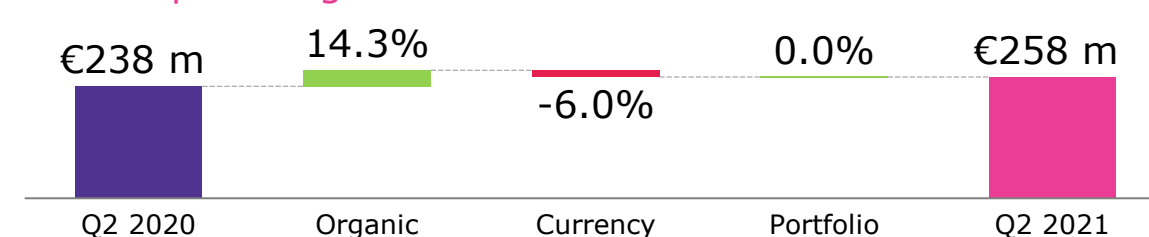
Comments

- 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



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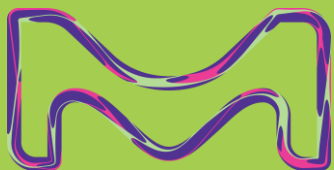


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