

CAPITAL MARKETS DAY 2018

MEET MANAGEMENT

Stefan Oschmann, CEO Marcus Kuhnert, CFO

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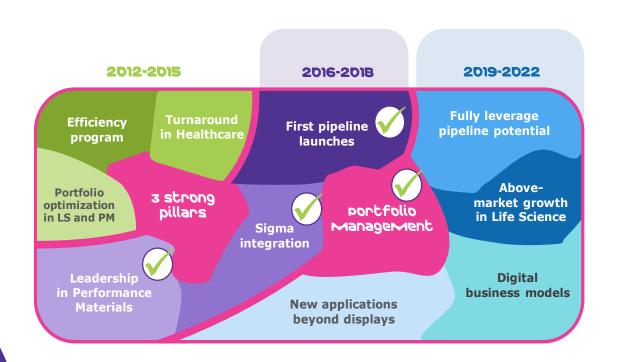
This presentation contains certain financial indicators such as EBITDA pre exceptionals, net financial debt and earnings per share pre exceptionals, which are not defined by International Financial Reporting Standards (IFRS). These financial indicators should not be taken into account in order to assess the performance of Merck KGaA, Darmstadt, Germany in isolation or used as an alternative to the financial indicators presented in the consolidated financial statements and determined in accordance with IFRS. The figures presented in this statement have been rounded. This may lead to individual values not adding up to the totals presented.



Agenda

- Transition & Execution Phase 2016-2018
- O2 Growth & Expansion Phase 2019-2022
- **Healthcare Transitioning into period of pipeline-derived earnings growth**
- Life Science Set for sustainable profitable growth
- Performance Materials Back to growth as leader in electronic materials
- Conclusions and Take-aways

Well on track to deliver on 2016-2022 strategic roadmap





- Merck KGaA,
 Darmstadt, Germany
 entered a phase of
 integration and
 deleveraging
 following Sigma
 acquisition
- By now, major milestones have been achieved



- Merck KGaA,
 Darmstadt, Germany
 is now ready for the
 growth phase in its
 strategic roadmap
- First steps have already been initiated



Completion of execution phase puts Merck KGaA, Darmstadt, Germany in good shape to now enter the growth phase of its 2016-2022 strategic agenda



First phase of strategic roadmap delivered (1/2)



нealthcare

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



- **Bavencio**[®] and **Mavenclad**[®] ramped up to ~€84 M sales in **first full year** (Q3 2017 - Q2 2018)
- Core business grown for consecutive 29
 quarters*
- Diligent development and management of pipeline
- Positive **news flow** on pipeline **catalysts** (e.g. BTKi, RCC1L, TGF-ß Trap)



Life science

- Focus on seamless integration and deliver cost synergies
- Leverage strategic capabilities for value creation



- **€280 M synergies** confirmed for 2018
- Sales CAGR ~6% since 2015 = 200 bps above market despite integration
- ecommerce platform seamlessly integrated
- supply chain globally leveraged despite portfolio complexity of ~300,000 products
- Focus shifting on innovation projects to foster industry-leading growth and profitability

First phase of strategic roadmap delivered (2/2)



performance materials

- Drive innovation and technology leadership across all businesses
- Reposition for future growth



- Leading Market positions Maintained despite sales and profit decline
- Transformation program to deliver on electronics solutions provider strategy
- NEW R&D framework established



Group

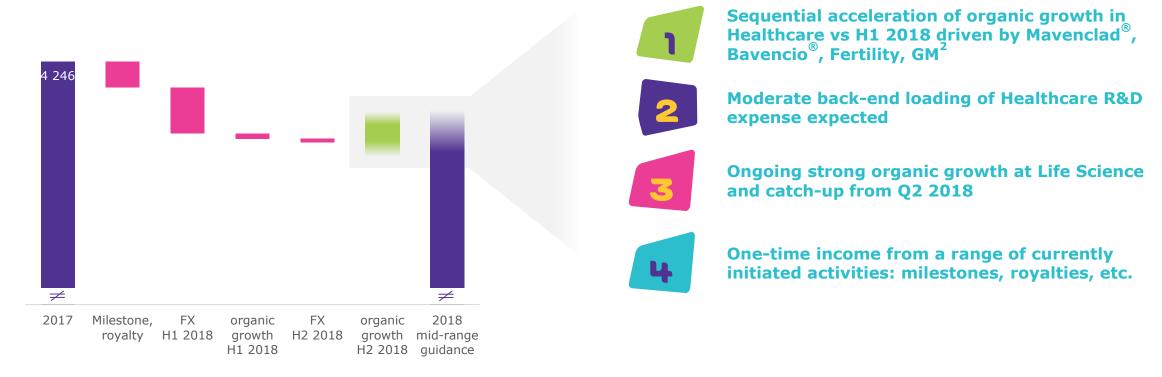
- Deleverage to <2x net debt / EBITDA pre in 2018
- No large¹ acquisitions until end of 2018 (unless financed by divestments)
- Dividend policy that ensures a sustainable and resilient development



- Leverage target for end 2018 confirmed
- conservative approach to M&A:
 divestments (Consumer Health², Biosimilars) > acquisitions (BioControl, Vertex, F-Star, Natrix)
- bividend and EPS pre growing in sync at ~9-10% CAGR 2011-2017

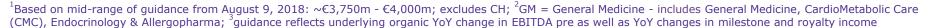
Organic growth drivers in H2 2018 underpin full-year EBITDA pre guidance

Expected EBITDA pre development in 2018¹ [€m YoY]





Confident to achieve 2018 guidance of slight organic decline in group EBITDA pre in the range of -1% to -3%³







2018 is a year of transition to deliver quality growth from 2019 again

Group commitment

to 2019 earnings growth confirmed and well-founded ...

Investment 2018 2019 Sales Sales EBITDA pre EBITDA pre Margin Margin

... as **BUSINESSES** deliver on their 2019 ambition



Key earnings drivers to remember for 2019



EBITDA*-supporting factors

- Organic sales growth in Healthcare's core business in line with mid-term ambition until 2022
- Ongoing strength at Life Science with organic net sales growth slightly above market
- Strong sales contribution from Mavenclad® and Bavencio®; possible upside from first sales contribution from Mavenclad® US in case of approval
- Erbitux/Lilly end of exclusive marketing rights outside of the US and Canada at the end of 2018
- High level of cost consciousness and prioritization



EBITDA*-reducing factors

- Slight absolute increase in R&D costs budgeted for Healthcare but decrease as % of sales (actual development will be subject to clinical data outcome of priority projects and prioritization decisions)
- · Healthcare underlying margins negatively impacted by product mix
- Performance Materials sales and earnings reaching trough due to expected decline in Liquid Crystals



Topline growth will be the key contributor in 2019 to outperform 2018 EBITDA pre

First steps for Growth & Expansion phase 2019-2022 initiated

- Focus and priority development of key pipeline projects
- Major phase III read-outs expected in next 18 months
- Regular inflow of early-stage assets to ensure long-term pipeline potential
- Driving development into a leading electronics solutions provider
- Stronger focus to existing endmarket needs
- Stabilize and optimize Display Solutions business
- Rigorous innovation and project prioritization process implemented

Fully leverage **Healthcare**pipeline potential

Above-market growth in **Life**

Repositioning of performance materials for growth

business models

- Favorable portfolio mix with exposure to growth market segments
- Full **operating leverage** drives margin progression
- Strategic initiatives enable sustained above-market growth
- Capacity investments to support industry growth dynamics
- Developing new digital business models
- Leverage big data on predictive planning
- Differentiated market presence

Strategic capital allocation until 2022 newly defined



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

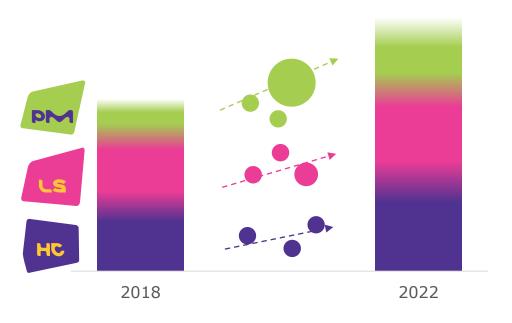
pefining portfolio criteria

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

clear financial M&A criteria

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

Illustration Group's sales and earnings drivers



Bolt-ons and in-licensing



Larger acquisitions



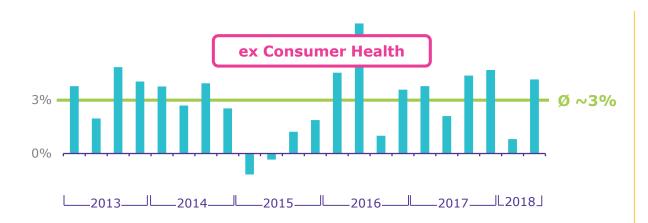
Regular portfolio review and disciplined capital allocation will continue to ensure sufficiently diversified and value-creating structure of three strong pillars



Core business consistently growing and on track to reach 2022 ambition

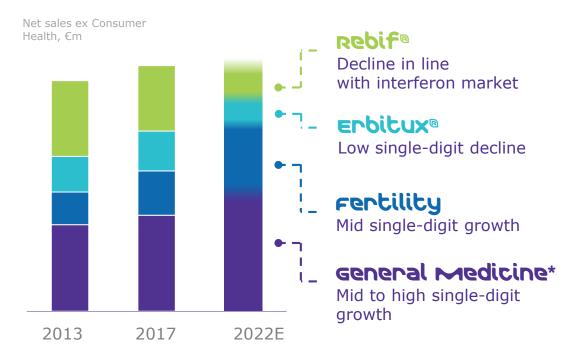
Impressive growth track record of core business ...

Organic net sales, % YoY



- Achieved ~3% growth of core business since 2013 –
 even excluding CH and without new pipeline products
- Organic sales growth is primarily driven by consistently solid volume growth; overall pricing trend has been slightly negative

... lays solid foundation to deliver on 2022 ambition

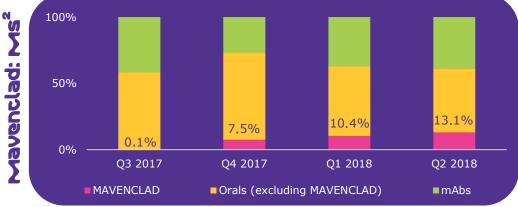


- Keeping net sales of core business organically at least stable until 2022
- Healthcare benefits from emerging market dynamics,
 and broad diversification of therapeutic areas and regions

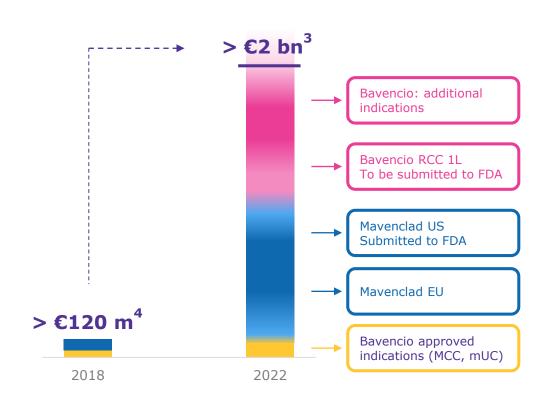
Healthcare Mavenclad[®] and Bavencio[®] are growing well and support €2 bn pipeline target

Recently launched products are gaining market traction in 2018 ...





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



¹US: naïve/1L Patient share of IO class in 2018 - Data sources: IMS claims data, Week ending Aug 10, 2018; ²Germany; share of HE dynamic patients (RMS only) - Data sources: actual patients per IMS and shares estimated from IPSOS MS Monitor; Dynamic markets per internal company estimates; ³Indication, risk adjusted; composition is an illustration and may change subject to data read-outs and registration outcomes; ⁴Guidance 2018

Recent successes demonstrate pipeline attractiveness



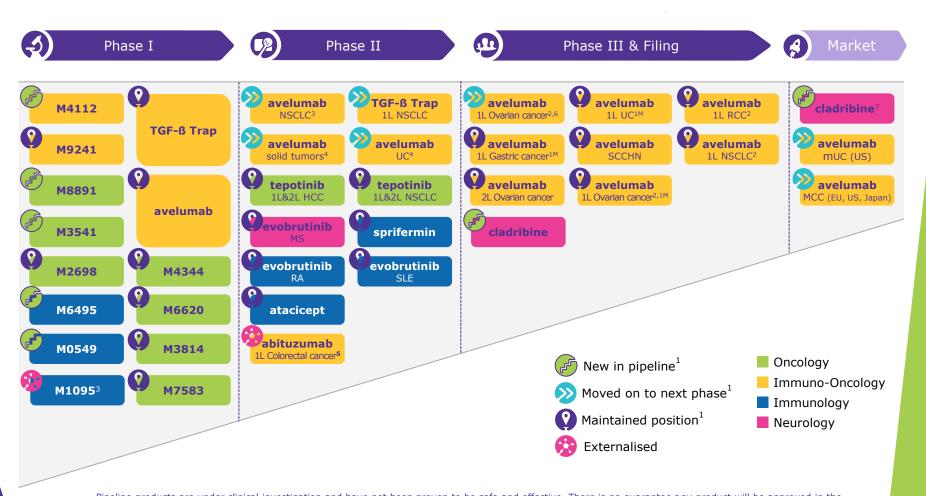
- Study met primary endpoint
- Evobrutinib 75mg QD² and 75mg BID² significantly reduced the number of gadolinium enhancing T1 lesions in comparison to placebo (24 weeks; mean total no. of lesions placebo: 3.85, evobrutinib 75mg QD: 1.69, evobrutinib 75mg BID: 1.15)
- Evobrutinib also led to clinically relevant decreases in annualised relapse rate (24 weeks; annualized relapse rate evobrutinib 75mg QD: 0.13, 75mg BID: 0.08, placebo: 0.37)
 - Evobrutinib is the first BTK inhibitor to show clinical proof-of-concept in relapsing MS



- Study showed a statistically significant improvement in progression-free survival (PFS) in
 - patients whose tumors had PD-L1⁴-positive expression greater than 1% (primary objective)
 - the entire study population regardless of PD-L1 tumor expression (secondary objective)
- Study will continue as planned for the other primary endpoint of overall survival (OS)
- The alliance intends to pursue a regulatory submission in the US based on these interim results

¹European Committee for Treatment and Research In Multiple Sclerosis, oral presentation "Primary Analysis of a Randomised, Placebo-Controlled, Phase II Study of the Bruton's Tyrosine Kinase Inhibitor Evobrutinib (M2951) in Patients with Relapsing Multiple Sclerosis"; ²QD= once a day, BID= twice a day, RCC= Renal cell carcinoma; ³ESMO= European Society for Medical Oncology; ⁴Programmed death ligand-1

Our diverse and dynamic pipeline has progressed dynamically



Takeaways

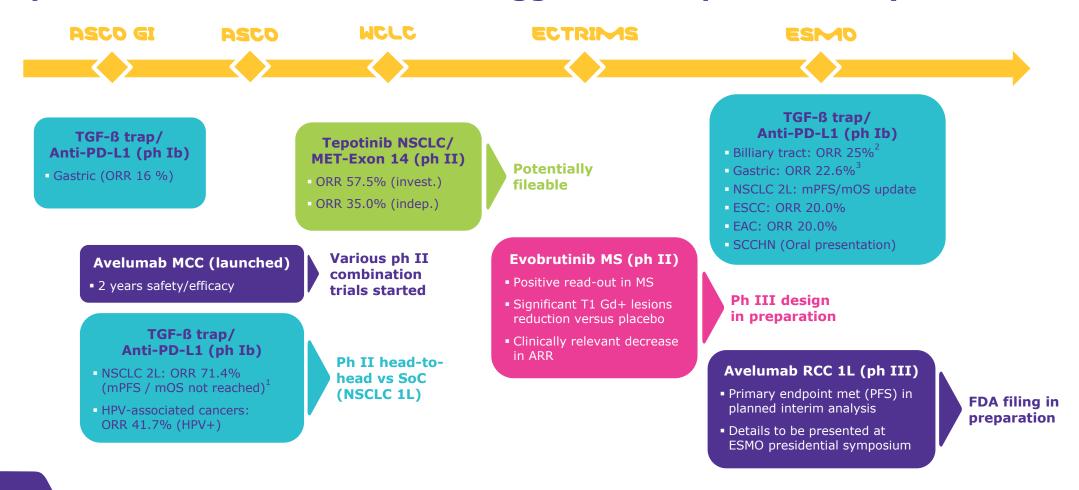
Pipeline contains highly attractive and innovative assets in key indications

Well-filled funnel of early and advanced compounds

Fast-progress pipeline requires regular prioritization

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; ¹compared to pipeline as of Q2 2017 results release on Aug 3, 2017; ²First Line treatment; ¹M First-line maintenance treatment; ³As announced on March 30 2017, in an agreement with Avillion, anti-IL-17 A/F nanobody will be developed by Avillion for plaque psoriasis and commercialized by Merck KGaA, Darmstadt, Germany; ⁴Avelumab combination studies with talazoparib, axitinib, ALK inhibitors, chemotherapy, or novel immunotherapies; ⁵As announced on May 2 2018, in an agreement with SFJ Pharmaceuticals Group, abituzumab will be developed by SFJ for colorectal cancer through Phase II/III clinical trials; °Study of avelumab in combination with talazoparib; ²As announced on July 30 2018, the US Food and Drug Administration (FDA) has accepted the resubmission of the New Drug Application (NDA) for cladribine tablets

Impressive clinical data in 2018 triggered next phase for key assets



Leading-edge clinical data validates pipeline attractiveness

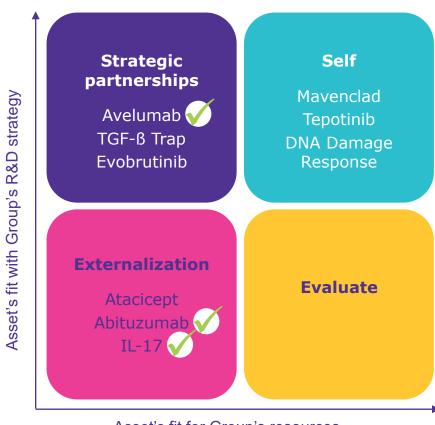
¹PD-L1 high; ²PD-L1≥1%; ³Update from ASCO GI, Abbreviations: 2L = second line therapy; PR = partial response; ORR = objective response rate; NSCLC = Non-small-cell lung carcinoma; (m)PFS = (median) progression-free survival; (m)OS = (median) Overall survival; HPV = human papillomavirus; SoC = standard of care; MCC = Merkel cell carcinoma; RCC = Renal cell carcinoma; RR = lesion rate ratio; ARR = annualised relapse rate; SCCHN = squamous cell carcinoma of the head and neck; ESCC = Esophageal squamous cell carcinoma; EAC = Esophageal adenocarcinoma; CRC = Colorectal Cancer

Active management of Merck KGaA, Darmstadt, Germany's full pipeline to maximize its value

Full pipeline requires regular **prioritization** and **de-risking** decisions

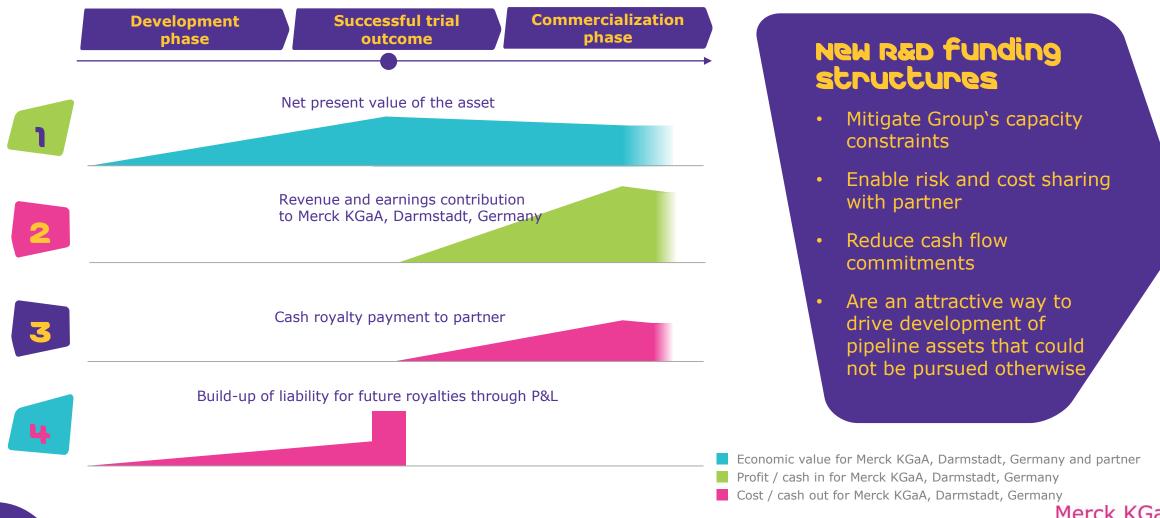
- Merck KGaA, Darmstadt, Germany continuously monitors all pipeline candidates
- Regular assessment of their potential is based on clinical data, strategic fit and financial criteria
- Merck KGaA, Darmstadt, Germany then decides on how to best develop the assets going forward
- Strategic partnerships and external financing are key to de-risk the pipeline and maximize its value

Merck KGaA, Darmstadt, Germany's key pipeline compounds*



Asset's fit for Group's resources

External financing maximizes value of non-strategic pipeline assets



Key priorities for 2019 and beyond



Deliver on ambition to keep core business at least stable until 2022



Transition from investment to earnings phase by 2019



Foster successful Bavencio[®] and Mavenclad[®] ramp up



Stringent pipeline execution

Healthcare

Drive positioning as global specialty innovator





Serving customers across the highly attractive life science industry



Biopharma R&D

Industry R&D



Pharmaceutical companies

Small biotech

Contract manufacturing organizations



Diagnostic manufacturers

Clinical testing labs

Food & Beverage manufacturers

~€150 bn* market growing at ~4% CAGR

- Growth in volume of experiments
- Mild growth in academic funding
- Investment in industry R&D

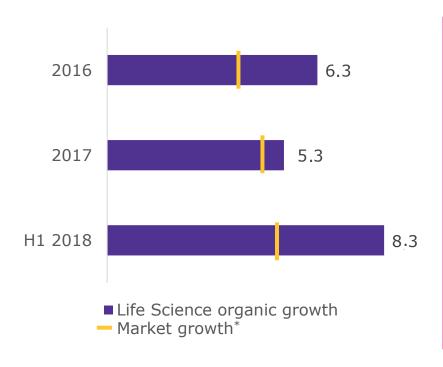
- Drug volume growth
 - from biologics
 - from emerging modalities
- Continued shift to single-use

- Volume growth from
 - Population growth
 - Rise in quality standards
 - Increased testing needs

Market leading growth and profitability maintained during integration

Consistent above-market growth

Organic sales growth vs market* [% YoY]



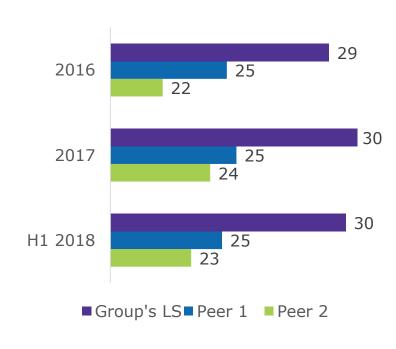
Key industry player

Life Science net sales [€m]



Superior profitability

EBITDA pre margin [%]



Ambition to grow above market through to 2022

Secure leading market position

Maintaining industryleading margin

Portfolio and focus are key drivers of above-market growth

Out-Performance

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

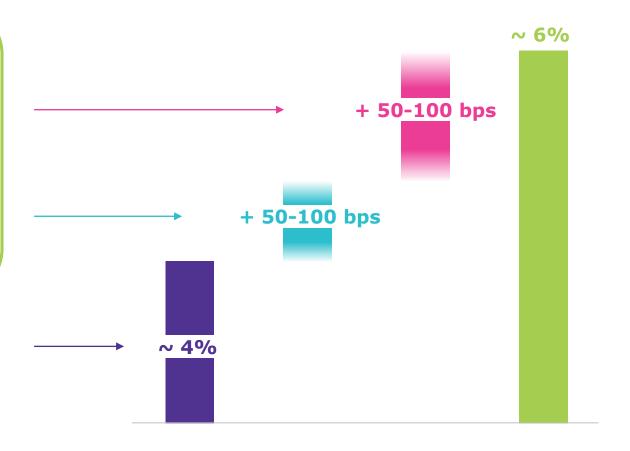
Portfolio advantage

- We focuse on higher-growth segments of the market
- E.g. bioprocessing, lab water, diagnostics offerings

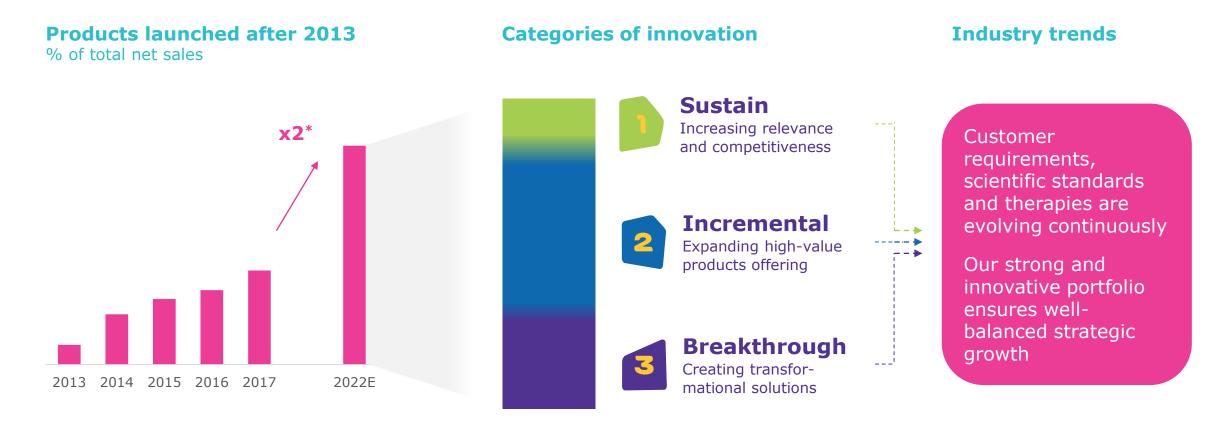
Life science market

 The life science industry grows rapidly and develops dynamically

Life Science net sales organic CAGR 2015-2017*



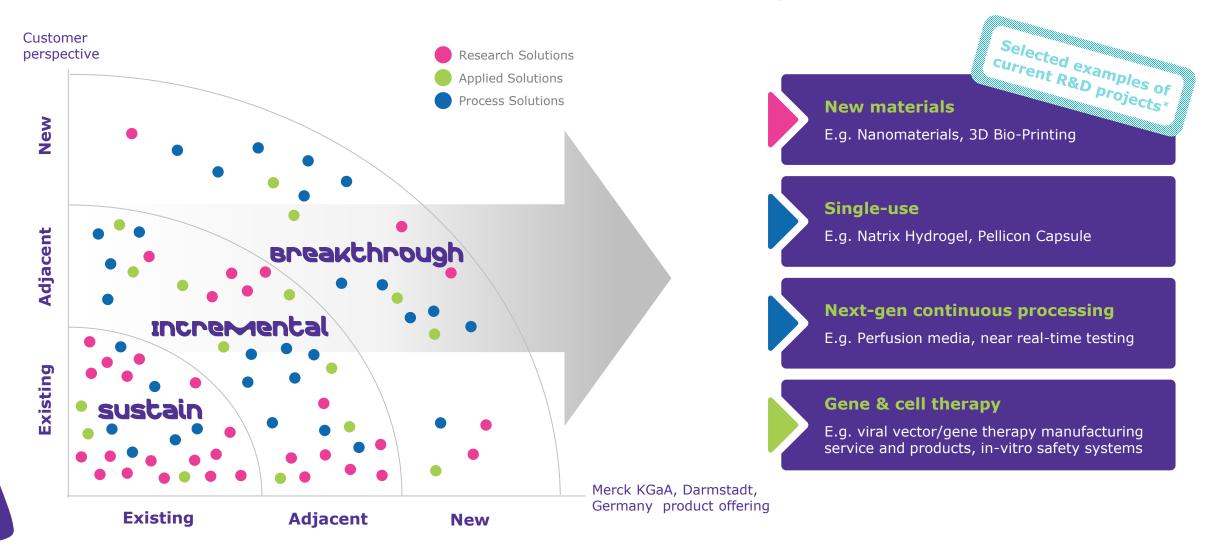
Innovation underpins Life Science's position as growth engine for us





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

Structured and broadly diversified portfolio of projects supports key trends



Research Solutions

Wide range of projects* to support and facilitate customers' R&D activities

3D Bioprinting

Engineered biocompatibility

- Tissue engineering polymers
- 3D bio-ink formulations with unique attributes and properties

connected Lab

Reimagined workflow

- Wireless & bluetooth enabled devices
- Hand-held, in-hood devices that improve workflow and link with enotebooks



Duolink

New standard in antibody-based detection of cellular events

- Custom assay development
- Adaptation into high throughput screening
- Platform pairing
- Pathway and antibody specific applications

nanomaterials

Novel reliable, ready-to-use materials

 For use in flexible electronics, implantable wearable sensors, batteries, solar energy generation, biomedical



Research Solutions is a leading supplier of premium products, with fast delivery times, and unparalleled customer experience and support

Today's process & portfolio

Tomorrow's process

Process Solutions

Next-generation bioprocessing on the cards





Continuous bioprocessing will ...

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

Process Solutions

Merck KGaA, Darmstadt, Germany's single-use technologies drive flexibility

in modern bioprocessing



Traditional Multi-use facility

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



innovative single-use facility

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



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

Applied Solutions

Broad offering across the dynamic cell and gene therapy value chain













Merck KGaA, Darmstadt, Germany offering

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

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

Create cell lines and cell models for testing safety and efficacy

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

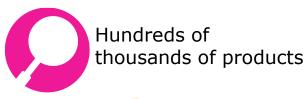
- Offer cGMP clinical and commercial manufacturing, e.g. manufacture viral vectors
- Improve the supply chain of cell therapy, e.g. cell and gene therapy products and services



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

Leading e-Commerce and operational excellence to serve customers

unique customer experience



SEARCH

Articles, protocols and peer reviewed papers





Highly reputable e-commerce platform

#1 in Life Science for web traffic

Ranking of websites:*

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

>100 M unique visits

>€ 1.5 BN sales

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

supply chain

>300K products

~13 ► lines shipped per year

~90% fill rate globally

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

Focus on profitable growth



Strengthen position as differentiated player in a highly attractive market



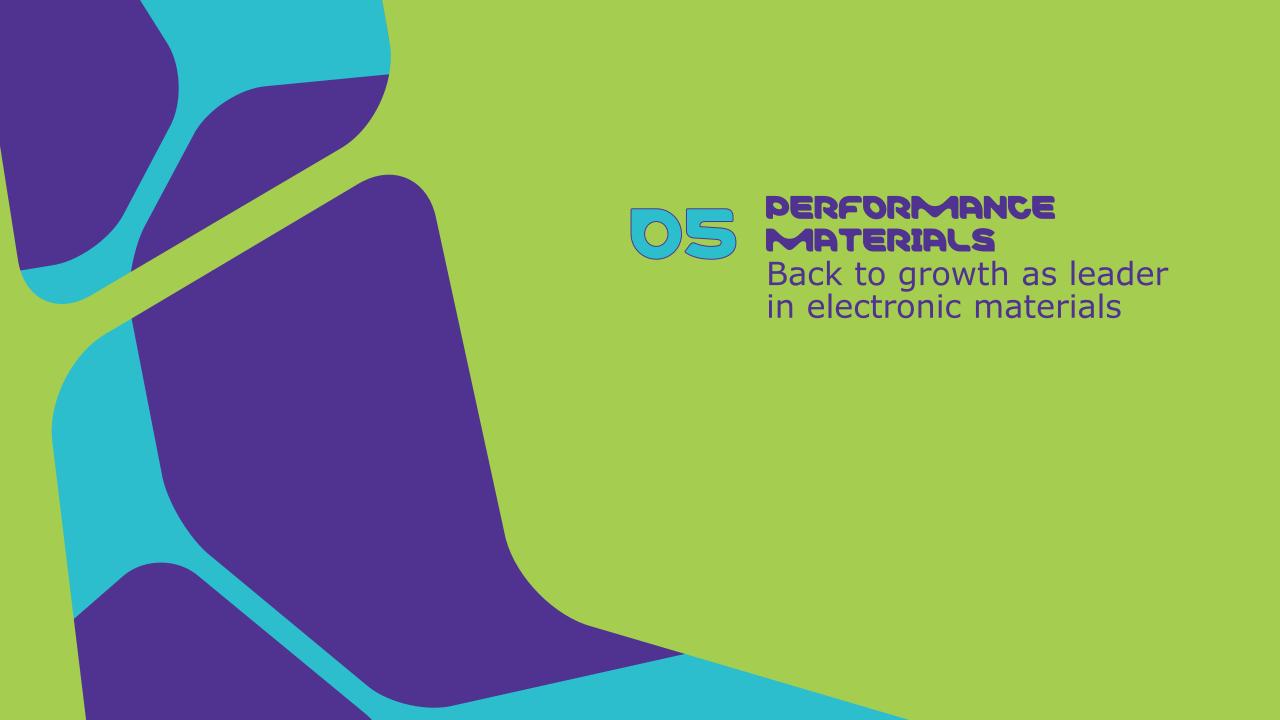
Maintain consistent above-market growth trajectory and superior profitability



Implement dynamic strategy for future profitable growth

Life science

Highly differentiated leader positioned for sustained profitable growth



Focusing on the attractive and highly diverse electronics market



electronic systems

¹Source: McClean 2018/IC Insights 2017, Gartner 2017, Prismark 2018, Statista 2016; IHS 2017 Abbreviation: CAGR = Compound annual growth rate; GDP = Gross domestic product

5-year transformation program to drive long-term performance



Back to organic Growth

- Exploit market growth of Semi & Surface
- Manage Liquid Crystal sales decline
- Continue innovation and life cycle management
- Explore growth in adjacent technologies

— — — — 2-3% CAGR

Resource allocation & process excellence

- Efficient reallocation/adjustment of resources
- Centralized early research approach
- Rigid R&D portfolio management

≥30% Margin

portfolio ManageMent

- Continuous review of entire portfolio
- Evaluate of partnering approaches

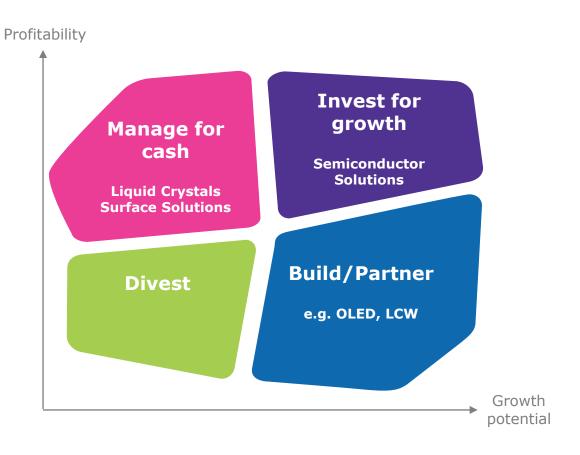
- Consider inorganic growth options
- Drive solution based business models

cultural change

- Foster customer centric mindset
- Market-driven innovation
- Enhance a common Performance Materials spirit

New portfolio and R&D approaches will drive future value creation

Clear portfolio roles defined



New R&D approach implemented



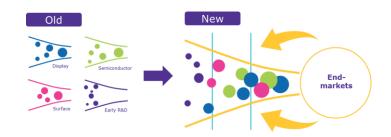
R&D activities will follow three principles to ensure higher R&D efficiency

Optimized R&D risk portfolio



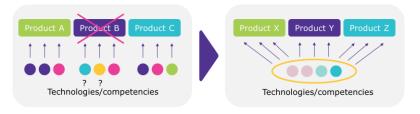
- Stronger focus on existing endmarket needs
- Shifting resources towards extension projects
- Reducing reliance on individual large projects in category "New technologies in new markets"

Centralized portfolio management



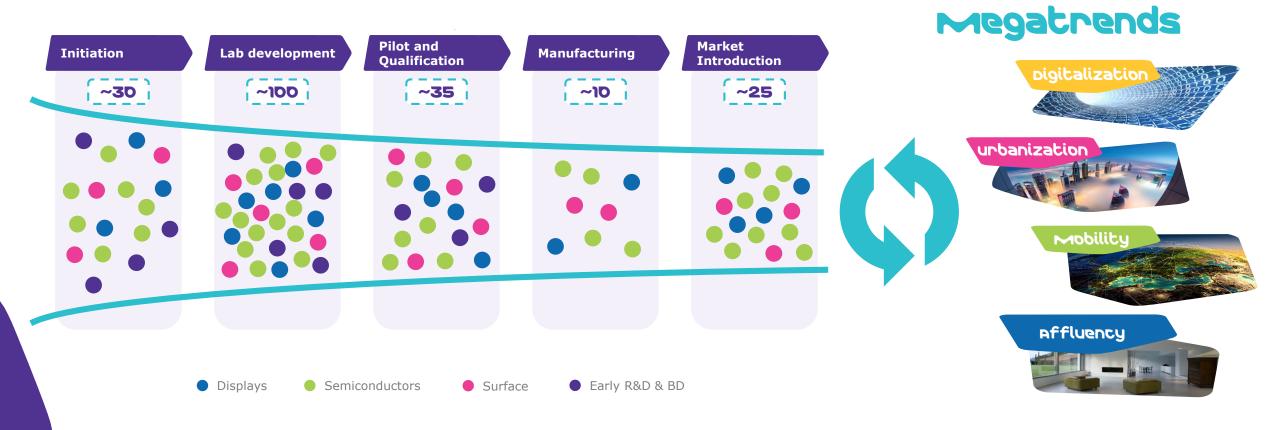
- Faster stop/go decision making
- Risk-adjusted pipeline assessment
- Improved transparency

Integrated R&D organization

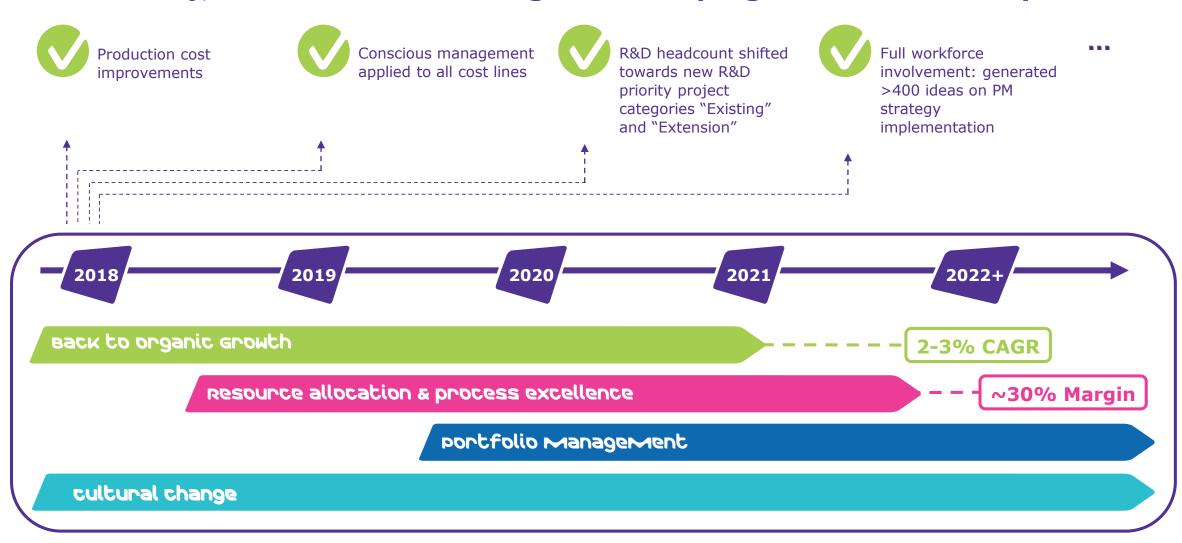


- Central resource allocation
- Responding faster to changing customer requirements
- Leverage competence across projects and businesses

Rich R&D funnel with ~200 projects* to address customers' needs



Since 3rd July, first measures of "Bright future" program have been implemented



Key priorities for 2019 and beyond



Deliver on growth ambition of 2-3% CAGR



Implement 5-year transformation program



Ensure efficient resource allocation to reach financial ambition of 30% margin



Maintain strong cash generation and cash conversion

performance materials

Back to growth as leader in electronic materials



Merck KGaA, Darmstadt, Germany cannot de-couple from but prepare well to manage external events

protectionism:
rational arguments
to be considered

Facts

- US and China are important markets for Group = combined 36% of 2017 sales
- ~25% of employees in both countries
- Significant manufacturing and research facilities there in both countries

Impact

- So far, only minimal effects observed
- Pharmaceutical products are currently not affected
- Effects on chemicals products are limited
- Merck KGaA, Darmstadt, Germany hopes rational arguments will be taken into consideration to limit negative consequences

brexit: hope for the best but prepare for the worst

Facts

- ~1,500 employees at 14 locations
- Low single digit % of sales
- Numerous successful R&D collaborations

Actions

- Interdisciplinary task force set up
- Main watch-outs: trade & supply chain, regulatory, quality & safety, intellectual property and human resources
- Initiated precautionary measures, e.g. securing trade routes and supply chains, ensuring regulatory registrations & approvals
- Implemented ongoing evaluation process across our businesses

Executive Summary

1

Guidance for 2018 is confirmed and return to growth for 2019 is re-iterated

2

Healthcare: delivering on pipeline and keeping core business organically stable until 2022



Life Science: setting the benchmark in innovation and sustaining profitable growth slightly above markets



Performance Materials: executing on 5-year transformation program and positioning as leading electronics materials and solutions provider

merck kgan, parmstadt, germany transition to profitable growth phase well founded

