Delivering Value Creation

Capital Markets Day
London, December 5, 2018

Werner Baumann
CEO Bayer AG
Disclaimer

Cautionary Statements Regarding Forward-Looking Information

This presentation contains forward-looking statements. A forward-looking statement is any statement that does not relate to historical facts and events, but rather reflects Bayer’s current beliefs, expectations and assumptions regarding the future. This applies, in particular, to statements in this presentation on revenue growth, including product introductions and peak sales potential, synergies, especially in relation to the acquisition and integration of Monsanto Company, portfolio adjustments, cost reduction, financial targets and earnings, cash flow generation, deleveraging and other similar statements relating to future performance, including with respect to the markets in which Bayer is active.

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For more information on factors that could cause actual results and future events to differ from those anticipated in forward looking statements, please refer to the factors discussed in Bayer’s public reports which are available on the Bayer website at https://www.investor.bayer.com/en/reports/annual-reports/overview/, including in the Annual Report 2017 under the caption “Report on Future Perspectives and on Opportunities and Risks”.
# 2018: Progress Across all Divisions

Delivering on Guidance Despite Headwinds

<table>
<thead>
<tr>
<th>Group</th>
<th>2018 on track</th>
<th>Value crystallization of Covestro stake</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Status of Glyphosate litigation</td>
<td>Net financial debt at ~€36bn by end of 2018, ~€3bn ahead of plan</td>
</tr>
</tbody>
</table>

## Crop Science

- Growth ahead of competition and best-in-class profitability
- Full recovery in Brazil
- Successful start of integration

## Pharmaceuticals

- Growth at rate of competition
- cGMP remediation in Leverkusen fully on track
- Xarelto approvals/launch in CAD/PAD in EU/US
- Progress with Larotrectinib and Darolutamide

## Consumer Health

- Growth acceleration plan with strengthened management underway
- Return to growth in H2 2018
- Portfolio further focused through divestiture of Rx dermatology

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1 Report data peer group; 2 IQVIA; cGMP: current Good Manufacturing Practices; CAD: Coronary Artery Disease, PAD: Peripheral Artery Disease

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We are Well-Positioned to Deliver Significant Value Creation

Science for a better life
// Address societal needs and benefit from global megatrends

A global leader in Health & Nutrition
// Well-positioned to shape the future of our industries

Leveraging our core competencies
// Capture long-term, above-GDP growth and deliver attractive returns

Executing on tangible, near- and medium-term value levers
// Drive value creation

Committed to be a responsible leader in sustainability
// Drive change in a sustainable manner
Global Megatrends in Health & Nutrition
Attractive Macro Drivers of Our Businesses

Megatrends through 2050

<table>
<thead>
<tr>
<th>Aging Population</th>
<th>Growing Population</th>
<th>Pressure on Ecosystems</th>
</tr>
</thead>
<tbody>
<tr>
<td>People 60+ more than doubling¹</td>
<td>+2.2bn people¹</td>
<td>-17%</td>
</tr>
<tr>
<td>&gt;20% of total population¹</td>
<td>+50%</td>
<td>-20%</td>
</tr>
<tr>
<td>Preserve and restore health</td>
<td>Secure sufficient supply of quality food</td>
<td>Use natural resources more efficiently and responsibly</td>
</tr>
</tbody>
</table>

Societal Needs

<table>
<thead>
<tr>
<th>Our Mission</th>
</tr>
</thead>
</table>

We leverage science to address these societal needs – with the ultimate goal to improve people’s lives

² FAO 2017, (FAO Global Perspective Studies)
³ Nelson et. al, (2014); FAO 2016 “Climate change and food security”

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## Our Markets Have Highly Attractive Characteristics

### Favorable Industry Environment

<table>
<thead>
<tr>
<th>Market Size 2017</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>~ €90bn(^1)</td>
<td>Secular above-GDP growth trend</td>
</tr>
<tr>
<td>~ €870bn(^2)</td>
<td>Highly regulated, innovation-driven markets</td>
</tr>
<tr>
<td>~ €140bn(^3)</td>
<td>High market profitability</td>
</tr>
<tr>
<td></td>
<td>Ability to achieve leading position and margins while growing ahead of competition</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Market</th>
<th>Size (2017)</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop Science</td>
<td>~ €90bn(^1)</td>
<td>Bayer, Bayer CS market model</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>~ €870bn(^2)</td>
<td>IQVIA</td>
</tr>
<tr>
<td>Consumer Health</td>
<td>~ €140bn(^3)</td>
<td>Market model in-market sales OTC medicines, data from IQVIA, Nicholas Hall</td>
</tr>
</tbody>
</table>

\(^1\) Pro forma calculations Bayer, Bayer CS market model
\(^2\) IQVIA
\(^3\) Market model in-market sales OTC medicines, data from IQVIA, Nicholas Hall
We are a Global Leader in Health & Nutrition
Well-Positioned Across Our Businesses

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<table>
<thead>
<tr>
<th>Business</th>
<th>2018 Pro-forma Sales</th>
<th>Position</th>
<th>Product Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop Science</td>
<td>~€19bn (~43% of Group)</td>
<td>#1 Position</td>
<td>Leading portfolio of seed &amp; traits, crop protection and digital farming; World-class R&amp;D platform with best talent and technology in the industry; Positioned to shape the future of agriculture: development of tailored solutions to address farmers’ individual needs and challenges</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>~€17bn (~38% of Group)</td>
<td>#2 Position in Cardiovascular</td>
<td>One of the fastest growing Pharma businesses over the past five years; Xarelto and Eylea among the world’s leading Pharma brands; Innovative medicines in areas of high unmet medical need; Therapeutic focus areas: Cardiology, Oncology, Gynecology, Hematology and Ophthalmology; Strong position in emerging markets; Leading in Radiology and Women’s Health</td>
</tr>
<tr>
<td>Consumer Health</td>
<td>~€5bn (~12% of Group)</td>
<td>#2 Position</td>
<td>Leading Positions in 7 of the Top 10 OTC Markets; Focus categories: Allergy &amp; Cold, Cough, Sinus and Flu; Nutritionals; Dermatology; Pain and Cardio; Digestive Health; Concentrated portfolio of 16 mega-brands with annual sales of &gt;€100m</td>
</tr>
</tbody>
</table>

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1 The unaudited Pro-forma data are presented as if both the acquisition of Monsanto and the associated divestments had taken place as of January 1, 2018. Sales of Monsanto are presented in periods as per the Bayer fiscal year. One-time effects of business operations, the accounting for discontinued operations and the recognition and measurement of sales from certain business transactions have been adjusted in line with our accounting. Due to this simplified procedure, they explicitly do not reflect sales according to IFRS or IDW RH HFA 1.004, meaning they have not been audited.
Transformation into a Leader in Health & Nutrition – Next Phase to Deliver Future Value Creation

Past

Group Profile

HealthCare

Crop-Science

Chemicals

Polymers

Pharmaceuticals, Biological Products

Consumer Care, Diagnostics

Animal Health

Basic and Fine Chemicals

Specialty Products

Wolff Walsrode

H. C. Starck

Polyurethanes, Coatings, Fibres

Plastics, Rubber

Today

Crop Science

Pharmaceuticals

Consumer Health

Measures

// Organic top-line growth and profitability improvement

// Transformational M&A in all of today’s businesses

// Synergies realized from strategic acquisitions

// Value crystallized through optimally-timed divestments

// Shaping the future of Health & Nutrition

// Adjusted set-up for future value creation
Five Levers to Drive Value Creation

Through our leading positions in Health & Nutrition we create value for our shareholders and society.

Our Value Levers Are Designed to Deliver Attractive Returns

- World-class innovation
- Drive operational excellence
- Disciplined capital allocation
- Renowned corporate brand
- Highest sustainability standards

What We Do
# Innovation Will Deliver Sustained Growth

## Our Reconfigured Innovation Approach

<table>
<thead>
<tr>
<th>Major Innovation Drivers</th>
<th>Crop Science</th>
<th>Pharmaceuticals</th>
<th>Consumer Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meet required yield increases</td>
<td>Underlying unmet medical need and added net clinical benefit</td>
<td>Brand life cycle management to maintain portfolio freshness</td>
<td></td>
</tr>
<tr>
<td>Need for a responsible and sustainable use of natural resources</td>
<td>Novel platforms and technologies</td>
<td>Rx-to-OTC switches</td>
<td></td>
</tr>
</tbody>
</table>

### Divisional Pipelines

<table>
<thead>
<tr>
<th>&gt;75 projects</th>
<th>~50 projects</th>
<th>Double growth contribution from innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Sales Potential: up to €30bn</td>
<td>Significant peak sales potential of key late-stage pipeline assets</td>
<td>(from 15% to 30% of growth)</td>
</tr>
</tbody>
</table>

### Focus Areas

1. **Accelerate output by intensified external sourcing of innovative technologies and assets**
2. **Advancing Digital transformation: Leverage computational science and digital at scale across the value chain**
3. **Drive disruptive technologies (Bayer-wide via LEAPS)**

### Powerful Innovation Engine

- **€6.1bn** annual R&D investment
- ~18,300 employees in R&D
- Strong history of collaborations with innovative partners from academia and industry
- ~450 inventions p.a.

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1. Examples for collaboration partners from academia: German Cancer Research Centre, Tsinghua University, Broad Institute; examples for collaboration partners from industry: Loxo, Merck, Onyx, Orion
2. Pro-forma 2018e (FTE, year-end)
3. Any compound, device or alike for which Bayer starts seeking patent protection in any given year (reference: 2005-2017)

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Loxo Oncology – an Example for Instant Access to Innovation in a Well-Understood Therapeutic Area

**Overview**

- Larotrectinib is a novel tumor-agnostic targeted cancer therapy
- Demonstrates impressive anti-tumor activity in a wide range of tumors
- FDA approved for the treatment of adult and pediatric patients with solid tumors that have a neurotrophic receptor tyrosine kinase gene fusion
- Peak sales potential of >€750m

**Strategic Highlights**

- High unmet medical need
- Growth area
- Pioneering precision cancer therapy

Advancing Digital Transformation Across all Businesses

Digitize customer experience

Open new sources of value

Improve cost and quality

Drive additional growth & efficiency

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1 Identified by World Economic Forum in Sept. 2018 as one of the nine best factories in the world

2 Bayer Capital Markets Day /// London, December 5, 2018
With LEAPS, we are Driving Disruptive Technologies

Differentiated Approach to Co-create Disruptive Technologies

### Approach

| Focus on game-changing technologies to address fundamental challenges and shift the core paradigms in Health and Nutrition |

### Current key ventures

| Access to gene editing (CRISPR) | $25bn$^{1}$ |
| Access to stem cell technology | $180bn$^{1}$ |
| Access to microbe technology | $100bn$^{2}$ |

### Addressable market

1. Frost & Sullivan, market by 2030
Bayer 2022 Synergy & Efficiency Programs

Crop Science
- Realization of Crop Science sales and cost synergies

Pharmaceuticals
- Re-alignment of R&D activities towards external innovation
- Adjustment of the hematology manufacturing footprint

Consumer Health
- Comprehensive growth acceleration program

Platform cost reduction
- Adjustment of corporate platform

✓ Targeted overall contribution of ~€2.6bn by 2022
✓ Global FTE impact ~12,000
We Have Clear Priorities for Capital Allocation
Focus on Shareholder Return, Deleveraging, and Innovation

**Disciplined capital allocation**

- Shareholder Return
- Deleveraging
- Innovation & Acquisitions

**Free Cash Flow**

**Targeted**

~€23bn
2019e-2022e

+ Divestment proceeds

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1 Free cash flow (FCF) defined as = Net cash flow provided by operating activities - CAPEX (PPE and Intangible assets) + interest & dividends received - interest paid + interest received from interest rate swaps; excluding contributions from divested businesses

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Bayer Stands for Trust, Reliability and Quality
Driving Brand Awareness and Elevating Perception

Value-accretive umbrella brand

- Aided awareness well above industry norms
- Bayer brand accounts for ~30% of product brands’ trustworthiness
- Endorses quality and drives premium pricing
- Value accretive to all divisions
- Recommend up to 3x more often
- Pay up to 2x more for a Bayer product
- Signals regulatory responsibility and societal commitment

Leading product brands

- Crop Science
- Pharmaceuticals
- Consumer Health

Source: Company Information, EvaluatePharma, Euromonitor

1 Bayer’s score is ~87%. “Aided Awareness” is an industry standard metric used to understand brand strength, and it refers to the level of recognition of the Bayer brand in a survey of the population. Data collection performed by Dialego

2 Brand Spillover Study October 2018, Bayer AG & Ludwig-Maximilians-Universität München

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Group Targets - Value Creation from Strengthened Base

Triple leverage

<table>
<thead>
<tr>
<th></th>
<th>2018e¹</th>
<th>2019 Indicative Guidance</th>
<th>Target 2022</th>
<th>CAGR 2018-2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>€bn</td>
<td>~44.6</td>
<td>~46</td>
<td>~52</td>
</tr>
<tr>
<td>EBITDA before special items</td>
<td>€bn</td>
<td>~11.5</td>
<td>~12.2</td>
<td>~16</td>
</tr>
<tr>
<td>Core EPS</td>
<td>€</td>
<td>~6.7</td>
<td>~6.8</td>
<td>~10</td>
</tr>
<tr>
<td>FCF</td>
<td>€bn</td>
<td>~4.1²</td>
<td>~3-4</td>
<td>~8</td>
</tr>
</tbody>
</table>

2022 targets at constant currencies, not including portfolio measures (except for Consumer Health)

¹ The unaudited pro-forma data are presented as if both the acquisition of Monsanto and the associated divestments had taken place as of January 1, 2018. Sales of Monsanto are presented in periods as per the Bayer fiscal year. One-time effects of business operations, the accounting for discontinued operations and the recognition and measurement of sales from certain business transactions have been adjusted in line with our accounting. Due to this simplified procedure, they explicitly do not reflect sales according to IFRS or IDW RH HFA 1.004, meaning they have not been audited; ² Standalone cash flow

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Key Priorities
Enhance Our Operating Performance and Drive Value Creation

1. Achieve operational targets
2. Integrate Crop Science and leverage #1 industry platform
3. Continue strengthening of internal pipeline and intensify external sourcing of innovative technologies and assets
4. Performance improvement of Consumer Health
5. Further focus our business
6. Adjust infrastructure across the Group
Financial Targets through 2022: Focus on Value Creation

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London, December 5, 2018

Wolfgang Nickl
CFO Bayer AG
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We Will Create Significant Value Through 2022 and Beyond

Focus on Execution and Driving Sustained Profitable Growth…

1. We have completed Bayer’s portfolio transformation into a global leader in Health & Nutrition

2. The next phase is focused on driving value creation through (i) growth ahead of competition enabled by innovation and portfolio measures (ii) profitability enhancement through Bayer 2022 synergy and efficiency programs and (iii) strong cash generation

3. We target Sales, Core EPS and FCF CAGR* until 2022 of 4%, 10% and 18%, respectively

4. Strong FCF along with proceeds from divestments enable (i) growing dividends, (ii) quick deleveraging of our balance sheet and (iii) selective bolt-ons and in-licensing transactions

*2018e PF used for Sales and Core EPS; 2018e used for FCF
Steady Growth until Today…
Profile Improvement Through Strategic Portfolio Measures

Development of key financials

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales in €bn</th>
<th>EBITDA before special items in €bn</th>
<th>Core EPS in €</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>35.1</td>
<td>7.1</td>
<td>1.50</td>
</tr>
<tr>
<td>2012</td>
<td>39.8</td>
<td>8.3</td>
<td>1.90</td>
</tr>
<tr>
<td>2014</td>
<td>42.2</td>
<td>8.8</td>
<td>2.25</td>
</tr>
<tr>
<td>2016</td>
<td>46.8</td>
<td>11.3</td>
<td>2.70</td>
</tr>
<tr>
<td>2017</td>
<td>35.0</td>
<td>9.3</td>
<td>2.80</td>
</tr>
<tr>
<td>2018</td>
<td>39.4</td>
<td>9.5</td>
<td>2.70</td>
</tr>
</tbody>
</table>

2018e PF results

<table>
<thead>
<tr>
<th></th>
<th>CAGR²</th>
<th>+3%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales in €bn</td>
<td>+6%</td>
<td></td>
</tr>
<tr>
<td>EBITDA before special items in €bn</td>
<td>+6%</td>
<td></td>
</tr>
<tr>
<td>Core EPS in €</td>
<td>+6%</td>
<td></td>
</tr>
<tr>
<td>Dividend per share in €</td>
<td>+8%</td>
<td></td>
</tr>
</tbody>
</table>

¹ As reported in the respective year; 2016 incl. Covestro; 2017ff ex. Covestro; 2018 incl. Monsanto
² CAGR from 2010 to 2018e PF

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We Will Make Further Portfolio Adjustments: Crystallizing Value of Non-core Assets

<table>
<thead>
<tr>
<th>Portfolio assets</th>
<th>Rationale</th>
<th>Financials (2018e)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sales</td>
</tr>
<tr>
<td>Animal Health</td>
<td>Explore strategic exit options for Animal Health</td>
<td>~€1.5bn</td>
</tr>
<tr>
<td>Currenta</td>
<td>Explore strategic options for share in Currenta</td>
<td>~€1.2bn</td>
</tr>
<tr>
<td>Coppertone, Dr.Schoell</td>
<td>Explore strategic options for Suncare &amp; Footcare</td>
<td>~€0.4bn</td>
</tr>
<tr>
<td></td>
<td>Crystallize value of consumer care brands to focus capital allocation on core OTC brands</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total:</strong></td>
<td>~€3.1bn</td>
</tr>
</tbody>
</table>
Transformation into a Global Leader in Health & Nutrition - Next Phase to Deliver Value Creation

Transformation Completed

Next Phase Focused on …

1. Growth ahead of competition in Health and Nutrition
2. Consistent profitability enhancement
3. Strong free cash flow generation
4. Disciplined capital allocation
Delivering Value through Relentless Execution on 4 Focus Areas

1. Growth ahead of competition
   - We are operating in highly attractive markets and allocate a substantial part of capital to R&D
   - Pharma and Crop expected to continue their growth trajectory ahead of competition
   - Consumer Health to approach market growth in the mid-term

2. Consistent profitability enhancement
   - Deliver on Crop Science synergy targets
   - Comprehensive growth acceleration program for Consumer Health
   - Adjustment of corporate platform after years of significant portfolio transformation

3. Strong free cash flow generation
   - Strong free cash flow generation supported by growth and stringent efficiency measures
   - Focus on Capex efficiency and Working Capital management

4. Disciplined capital allocation
   - Continue to grow dividends over the forecasting period
   - Focus on deleveraging
   - Disciplined M&A - focusing on bolt-ons & in-licensing
We Focus on Growth in Attractive Markets

<table>
<thead>
<tr>
<th>Market</th>
<th>Size 2017</th>
<th>CAGR 2018-2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bayer Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crop Science</td>
<td>~€90bn¹</td>
<td>~3%²</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>~€870bn³</td>
<td>4-5%</td>
</tr>
<tr>
<td>Consumer Health</td>
<td>~€140bn⁴</td>
<td>3-4%</td>
</tr>
</tbody>
</table>

Bayer’s growth levers:

- Using our leading positions in Agriculture, Pharmaceuticals and Self-care to address societal needs and benefit from global megatrends
- Drive innovation
- Leading portfolio of seed & traits, crop protection and digital farming
- World-class R&D platform with best talent and technology in the industry
- Positioned to shape the future of agriculture: Development of tailored solutions to address farmers’ individual needs and challenges
- Innovative medicines in areas of high unmet medical need
- Therapeutic focus areas: Cardiology, Oncology, Gynecology, Hematology and Ophthalmology
- Leverage external innovation and partnering as well as pipeline and potential of current products
- Branded self-care solutions that help transform people’s daily health
- Focus on five core categories

¹ Pro-forma calculations Bayer, Bayer CS market model; ² excluding potential cyclical recovery of the Crop Science market; ³ IQVIA; ⁴ Market model in-market sales OTC medicines, data from IQVIA, Nicholas Hall

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Bayer 2022 Synergy & Efficiency Programs

<table>
<thead>
<tr>
<th>Platform</th>
<th>Crop Science</th>
<th>Consumer Health</th>
<th>Pharmaceuticals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realization of Crop Science sales and cost synergies</td>
<td>~€0.17bn (= $0.2bn) sales synergies¹</td>
<td>Comprehensive growth acceleration program</td>
<td>Re-alignment of R&amp;D activities towards external innovation / Hemophilia production footprint</td>
</tr>
<tr>
<td>~€0.47bn (= $0.55bn) cost synergies</td>
<td>~€0.4bn contribution</td>
<td>~€0.2bn contribution</td>
<td></td>
</tr>
<tr>
<td>~€0.40bn (= $0.45bn) cost synergies</td>
<td>~€0.1bn contribution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjustment of corporate platform</td>
<td>~€0.9bn contribution</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 EBITDA before special items impact from sales synergies
2 Indicative Phasing: ~30% effective in 2020, ~70% in 2021 and 100% in 2022

Overall Contribution ~€2.6bn
Global FTE impact ~12,000
One-Time Cost ~1.7X

Consistent profitability enhancement
### Crop Science: Realization of Sales and Cost Synergies

<table>
<thead>
<tr>
<th>Key Initiatives</th>
<th>Synergies</th>
<th>Targeted Realization</th>
<th>Key Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales Synergies</td>
<td>~€0.2bn</td>
<td>By 2022</td>
<td>U.S., Brazil, Argentina and Mexico as key levers</td>
</tr>
<tr>
<td>Commercial and R&amp;D operations</td>
<td>~€0.3bn</td>
<td></td>
<td>Increase crop protection chemistry sales</td>
</tr>
<tr>
<td>Support Functions &amp; Country Integration¹</td>
<td>~€0.3bn</td>
<td>2018: ~5%</td>
<td>Digital Ag to serve as an enabler</td>
</tr>
<tr>
<td>Procurement¹ and Product Supply</td>
<td>~€0.1bn</td>
<td>2019: ~25%, 2020: ~55%</td>
<td>Integration of global &amp; regional commercial leadership organizations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2021: ~80%, 2022: ~100%</td>
<td>Salesforce and country footprint integration</td>
</tr>
<tr>
<td>IT Infrastructures¹</td>
<td>~€0.1bn</td>
<td></td>
<td>Integration of small molecules research and development-, field solutions-, regulatory science- &amp; R&amp;D support services</td>
</tr>
</tbody>
</table>

### Total Synergies

- ~€1bn

¹ Partially overlap with platform cost reduction initiative, total ~€0.4bn platform synergies
Pharmaceuticals: Re-alignment of R&D Activities and Adjustment of Hemophilia Manufacturing

<table>
<thead>
<tr>
<th>Key Initiatives</th>
<th>Contribution</th>
<th>Key Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Re-alignment of R&amp;D activities</td>
<td>~€0.1bn</td>
<td>// Increased externalization of R&amp;D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>// Adjustment of internal R&amp;D structures</td>
</tr>
<tr>
<td>Adjustment of the hemophilia manufacturing footprint</td>
<td>~€0.1bn</td>
<td>// Consolidation of FVIII manufacturing in Berkeley (USA)</td>
</tr>
</tbody>
</table>

Total Contribution: ~€0.2bn
# Consumer Health: Comprehensive Growth Acceleration Program

<table>
<thead>
<tr>
<th>Key Initiatives</th>
<th>Contribution</th>
<th>Key Measures</th>
</tr>
</thead>
</table>
| Lean organization               | ~€0.1bn      | // Flattening structures
|                                 |              | // Regional cluster optimization
|                                 |              | // Reduction of divisional HQ structures
| Cost optimization               | ~€0.2bn      | // ZBB\(^1\) implementation across countries and functions
|                                 |              | // Cost optimization (non-working media, market research, travel, conferences)
| COGS optimization               | ~€0.1bn      | // Internal & external site network optimization
|                                 |              | // Reduce product write-offs
|                                 |              | // Cost optimization & reduction # of SKUs\(^2\)
| Reduction of platform cost      | ~€0.1bn      | // Share of corporate platform efficiency program

**Total Contribution** ~€0.5bn

---

\(^1\) Zero-based budgeting
\(^2\) Stock Keeping Unit
\(^3\) Overlap with platform cost reduction initiative

---

// Bayer Capital Markets Day // London, December 5, 2018
### Platform Cost Reduction: Adjustment of Corporate Platform

<table>
<thead>
<tr>
<th>Key Initiatives</th>
<th>Contribution</th>
<th>Thereof contribution divisional programs</th>
<th>Key Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural change</td>
<td>~€0.7bn</td>
<td></td>
<td>// Review footprint of cross-divisional country platforms</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>// Reduce redundancies between divisional / corporate functions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>// Functional synergies from the Post Merger Integration</td>
</tr>
<tr>
<td>Activity reductions</td>
<td>~€0.4bn</td>
<td>~€0.4bn Crop Science</td>
<td>// Reduce service levels and processes of corporate functions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+ ~€0.1bn Consumer</td>
<td>// Rationalize and reduce IT application landscape</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>// Prioritize project portfolio</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>// Review financial steering model and budgeting process</td>
</tr>
<tr>
<td>Efficiency improvements</td>
<td>~€0.3bn</td>
<td></td>
<td>// Optimize real estate utilization and facility management</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>// Standardize and automate back office processes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>// Consolidate external service providers</td>
</tr>
<tr>
<td>Total Contribution</td>
<td>~€1.4bn</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Consistent profitability enhancement
Targeting Significant Profitability Improvements Across All Divisions

<table>
<thead>
<tr>
<th>Division</th>
<th>Sales (€bn)</th>
<th>EBITDA (€bn)</th>
<th>Margin (%)</th>
<th>Growth (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop Science</td>
<td>19.3</td>
<td>4.5</td>
<td>~23%</td>
<td>~4%</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>16.8</td>
<td>5.6</td>
<td>~33%</td>
<td>~4%</td>
</tr>
<tr>
<td>Consumer Health</td>
<td>5.5</td>
<td>1.1</td>
<td>~20%</td>
<td>~1%</td>
</tr>
<tr>
<td>Bayer Group</td>
<td>44.6</td>
<td>11.5</td>
<td>~26%</td>
<td>~4%</td>
</tr>
</tbody>
</table>

2018e PF

2019 Indicative Guidance

Target 2022

- Consistent profitability enhancement

2022 targets at constant currencies, not including portfolio measures (except for Consumer Health)

1 Includes portfolio measures;

Bayer Capital Markets Day // London, December 5, 2018
Robust Development of Underlying Earnings

Core EPS in 2019 Held Back by Portfolio Adjustments and One-time Effects

1 Assumptions: Core tax rate of ~23% in 2018-2022; number of shares: ~980m in 2018 and ~982m in 2019-2022; 2 Pro forma calculation presented in Q2 and Q3 Earnings Calls on September 5th and November 13th respectively; 3 Covestro and Rx-Dermatology

1 EBITDA before special items (€bn)

Consistent profitability enhancement
Core EPS to Reach ~€10 by 2022 Driven by Sales Growth and Bayer 2022 Synergy & Efficiency Programs

<table>
<thead>
<tr>
<th>Contributions €bn</th>
<th>EBITDA before special items (€bn)</th>
<th>€bn</th>
</tr>
</thead>
<tbody>
<tr>
<td>~0.2</td>
<td>~9.5</td>
<td>~16</td>
</tr>
<tr>
<td>~0.1</td>
<td>~11.5</td>
<td>~2.6</td>
</tr>
<tr>
<td>~0.2</td>
<td>~12.2</td>
<td></td>
</tr>
<tr>
<td>~2.1</td>
<td>~4.5</td>
<td></td>
</tr>
<tr>
<td>~0.5</td>
<td>~0.3</td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>~10</td>
<td></td>
</tr>
<tr>
<td>~2.4</td>
<td>~0.4</td>
<td></td>
</tr>
<tr>
<td>~0.5</td>
<td>~1.7</td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>~2.1</td>
<td></td>
</tr>
<tr>
<td>~1.9</td>
<td>~1.9</td>
<td></td>
</tr>
<tr>
<td>~0.4</td>
<td>~0.4</td>
<td></td>
</tr>
<tr>
<td>~0.3</td>
<td>~0.3</td>
<td></td>
</tr>
<tr>
<td>~10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Consistent profitability enhancement

<table>
<thead>
<tr>
<th>Core EPS (€)</th>
<th>2018e</th>
<th>2018e PF</th>
<th>2019e</th>
<th>Growth</th>
<th>Cost Inflation</th>
<th>Synergies / Efficiencies</th>
<th>Reinvest</th>
<th>Financial Result</th>
<th>2022e</th>
</tr>
</thead>
<tbody>
<tr>
<td>~5.7-5.9</td>
<td>~6.7</td>
<td>~6.8</td>
<td>~3.4</td>
<td>~4.5</td>
<td>~2.1</td>
<td>~0.5</td>
<td>0.0</td>
<td>~10</td>
<td>~16</td>
</tr>
</tbody>
</table>

1 Assumptions: Core tax rate of ~23% in 2018-2022; number of shares: ~980m in 2018 and ~982m in 2019-2022; 2 Pro forma calculation presented in Q2 and Q3 Earnings Calls on September 5th and November 13th respectively; 3 Covestro and Rx-Dermatology
Cash Flow Improvement Focusing on Capex and Working Capital Optimization

**Capex spend in €bn**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Intangibles</td>
<td>1.5</td>
<td>1.9</td>
<td>2.2</td>
<td>2.5</td>
<td>2.6</td>
<td>3.1</td>
<td></td>
</tr>
<tr>
<td>Fixed assets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*in % of sales* 4.3% 4.9% 5.7% 7.4% 6.0% 7.0%

- **Focused CapEx below current levels** ~ 5-6%
- Annual contribution of ~0.5bn EUR by 2022
- Past and current levels impacted by single large-scale investments in fixed assets
- Licensing will continue to be an element to drive growth

**Working Capital in €bn**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Intangibles</td>
<td>9.3</td>
<td>10.1</td>
<td>12.0</td>
<td>9.5</td>
<td>9.9</td>
<td>15.0</td>
</tr>
<tr>
<td>Fixed assets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*in % of sales* 26% 25% 29% 27% 28% 34%

- **Working capital optimization** ~ 32%
- Annual contribution of ~0.5bn EUR by 2022
- Focus on optimization of inventory levels and receivables management

1 Crop Science 48%, Pharmaceuticals 24%, Consumer Health 24%; 2 Working Capital estimated at year-end

---

39 \[// Bayer Capital Markets Day /// London, December 5, 2018\]
**Group Targets - Value Creation from Strengthened Base**

**Triple Leverage**

<table>
<thead>
<tr>
<th>€bn</th>
<th>2018e PF</th>
<th>Indicative Guidance 2019</th>
<th>Target 2022</th>
<th>CAGR 2018-22²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales¹</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Group</td>
<td>44.6</td>
<td>~46 (~4%)</td>
<td>~52</td>
<td>~4%</td>
</tr>
<tr>
<td>Crop Science</td>
<td>19.3</td>
<td>~4%</td>
<td></td>
<td>&gt;4%</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>16.8</td>
<td>~4%</td>
<td></td>
<td>~4-5%</td>
</tr>
<tr>
<td>Consumer Health</td>
<td>5.5</td>
<td>~1%</td>
<td></td>
<td>~2%</td>
</tr>
<tr>
<td><strong>EBITDA before special items (%)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Group</td>
<td>11.5 (~26%)</td>
<td>~12.2 (~27%)</td>
<td>~16 (&gt;30%)</td>
<td>~9%</td>
</tr>
<tr>
<td>Crop Science</td>
<td>4.5 (~23%)</td>
<td>~25%</td>
<td>&gt;30%</td>
<td></td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>5.6 (~33%)</td>
<td>~34%</td>
<td>&gt;35%</td>
<td></td>
</tr>
<tr>
<td>Consumer Health</td>
<td>1.1 (~20%)</td>
<td>~21%</td>
<td>~24%⁴</td>
<td></td>
</tr>
<tr>
<td>Core EPS (€)</td>
<td></td>
<td></td>
<td>~10</td>
<td>~10%</td>
</tr>
<tr>
<td>FCF</td>
<td>~4.1³</td>
<td>~3-4</td>
<td>~8</td>
<td>~18%</td>
</tr>
<tr>
<td>Net financial debt</td>
<td>~36³</td>
<td>~36⁵</td>
<td>~26-28</td>
<td></td>
</tr>
</tbody>
</table>

2022 targets at constant currencies, not including portfolio measures (except for Consumer Health)

¹ Sales: cpa growth; ² CAGR from 2018 base year; ³ FCF 2018e (as reported); ⁴ includes portfolio measures; ⁵ including around ~€1bn lease liability due to IFRS 16

/// Bayer Capital Markets Day /// London, December 5, 2018
We Have Clear Priorities for Capital Allocation

Focus on Shareholder Return, Innovation and Deleveraging

- **Shareholder Return**
  - Growing dividends
  - Consider share buy backs with parts of divestment proceeds

- **Deleveraging**
  - Target range ~€26-28bn\(^1\) net financial debt by end 2022

- **Innovation & Acquisitions**
  - Investment in licensing opportunities
  - Potentially selective bolt-on acquisitions

**Disciplined capital allocation**

**Free Cash Flow Targeted**

~€23bn
2019e-2022e

**Divestment proceeds**

---

\(^1\) Before M&A / Portfolio

---

Bayer Capital Markets Day // London, December 5, 2018
We Will Create Significant Value Through 2022 and Beyond

Focus on Execution and Driving Sustained Profitable Growth…

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>We have completed Bayer’s portfolio transformation into a global leader in Health &amp; Nutrition</td>
</tr>
<tr>
<td>2</td>
<td>The next phase is focused on driving value creation through (i) growth ahead of competition enabled by innovation and portfolio measures (ii) profitability enhancement through Bayer 2022 synergy and efficiency programs and (iii) strong cash generation</td>
</tr>
<tr>
<td>3</td>
<td>We target Sales, Core EPS and FCF CAGR* until 2022 of 4%, 10% and 18%, respectively</td>
</tr>
<tr>
<td>4</td>
<td>Strong FCF along with proceeds from divestments enable (i) growing dividends, (ii) quick deleveraging of our balance sheet and (iii) selective bolt-ons and in-licensing transactions</td>
</tr>
</tbody>
</table>

2018e PF used for Sales and Core EPS; 2018e used for FCF

// Bayer Capital Markets Day // London, December 5, 2018
Financial Targets through 2022: Focus on Value Creation

Capital Markets Day
London, December 5, 2018

Wolfgang Nickl
CFO Bayer AG
Key Assumptions (1)

// **FX rates:** All figures based on constant 2018 rates as disclosed below

<table>
<thead>
<tr>
<th>Currency</th>
<th>Country</th>
<th>FX Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRL</td>
<td>Brazil</td>
<td>4.37</td>
</tr>
<tr>
<td>CAD</td>
<td>Canada</td>
<td>1.53</td>
</tr>
<tr>
<td>CHF</td>
<td>Switzerland</td>
<td>1.15</td>
</tr>
<tr>
<td>CNY</td>
<td>China</td>
<td>7.82</td>
</tr>
<tr>
<td>GBP</td>
<td>United Kingdom</td>
<td>0.89</td>
</tr>
<tr>
<td>JPY</td>
<td>Japan</td>
<td>131.01</td>
</tr>
<tr>
<td>MXN</td>
<td>Mexico</td>
<td>22.50</td>
</tr>
<tr>
<td>RUB</td>
<td>Russia</td>
<td>73.96</td>
</tr>
<tr>
<td>USD</td>
<td>United States</td>
<td>1.18</td>
</tr>
</tbody>
</table>

// **Free cash flow (FCF) defined as** = Net cash flow provided by operating activities - Capex (PPE and Intangible assets) + interest & dividends received - interest paid + interest received from interest rate swaps

// **Core Tax rate** of ~23% (2019-2022)

// **Number of shares:** ~980m in 2018 and ~982m in 2019-2022
Key Assumptions (2)

// **Pro-forma (PF) 2018:** The unaudited Pro-forma data are presented as if both the acquisition of Monsanto and the associated divestments had taken place as of January 1, 2018. Sales of Monsanto are presented in periods as per the Bayer fiscal year. One-time effects of business operations, the accounting for discontinued operations and the recognition and measurement of sales from certain business transactions have been adjusted in line with our accounting. Due to this simplified procedure, they explicitly do not reflect sales according to IFRS or IDW RH HFA 1.004, meaning they have not been audited.

// **Impairments:** €2.7bn for Consumer Health and €0.6bn for Pharmaceuticals
IFRS 16 – Summary and Illustrative Example

Existing operating lease contracts will be reported as so-called right of use assets and respective lease liabilities

- Right of use assets are part of the fixed assets and will generally be depreciated over the duration of the underlying lease contracts
- The new lease liabilities will increase the net debt position accordingly

Increase of EBITDA before special items compared to the prior accounting standard IAS17. Additional interest expense with regard to the lease liability

- Prior to the application of IFRS 16 the entire operating lease expense was fully EBITDA before special items effective
- Overall change in cash and cash equivalents due to business activities remains unchanged
- Neutral over the total term of the lease contract for net income, however different split between EBIT before special items and financial result
- Whereas IAS 17 provided for constant net income impact each year, IFRS 16 results in different net income effects per year depending on the contracts’ life cycle status

Illustrative example of one contract: annual lease payments 100, 3 year lease, discount rate 4%

<table>
<thead>
<tr>
<th>figures rounded</th>
<th>p.a.; Year 1-3</th>
<th>as of Jan 1, Year 1</th>
<th>as of Dec 31, Year 1</th>
<th>as of Dec 31, Year 2</th>
<th>as of Dec 31, Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>IAS 17*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Sales</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>EBITDA before special items</td>
<td>-100</td>
<td>-</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>EBIT before special items</td>
<td>-100</td>
<td>-</td>
<td>-93</td>
<td>-93</td>
<td>-93</td>
</tr>
<tr>
<td>Financial Result</td>
<td>-</td>
<td>-</td>
<td>-11</td>
<td>-7</td>
<td>-3</td>
</tr>
<tr>
<td>Net Debt</td>
<td>-</td>
<td>-278**</td>
<td>-189</td>
<td>-96</td>
<td>0</td>
</tr>
<tr>
<td>IFRS 16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IAS 17</td>
<td></td>
<td>-300</td>
<td>0</td>
<td>(+300)</td>
<td></td>
</tr>
<tr>
<td>IFRS 16</td>
<td>-300</td>
<td>-279</td>
<td>(+21)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IAS 17 / IFRS 16</td>
<td>-21</td>
<td>-21</td>
<td>(-21)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Prior accounting standard IAS 17 to be applied until Dec. 31st, 2018
** Sum of annual lease payments discounted at 4%

Bayer Capital Markets Day // London, December 5, 2018
Driving Performance and Delivering New Growth Opportunities

Capital Markets Day
London, December 5, 2018

Stefan Oelrich
Head of Pharmaceuticals

Joerg Moeller
Head of Pharmaceuticals R&D
Disclaimer

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This presentation contains forward-looking statements. A forward-looking statement is any statement that does not relate to historical facts and events, but rather reflects Bayer’s current beliefs, expectations and assumptions regarding the future. This applies, in particular, to statements in this presentation on revenue growth, including product introductions and peak sales potential, synergies, especially in relation to the acquisition and integration of Monsanto Company, portfolio adjustments, cost reduction, financial targets and earnings, cash flow generation, deleveraging and other similar statements relating to future performance, including with respect to the markets in which Bayer is active.

Although the forward-looking statements contained in this presentation are based upon what Bayer’s management believes are reasonable assumptions, they necessarily involve known and unknown risks and uncertainties that could cause actual results and future events to differ materially from those anticipated in such statements. Forward-looking statements are not guarantees of future performance and undue reliance should not be placed on them. Bayer undertakes no obligation to update forward-looking statements if circumstances or management’s estimates or opinions should change except as required by applicable securities laws.

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The Pharma Market Will Remain Attractive

Major market dynamics

- Aging population
- Accelerating pace of innovation
- Declining R&D productivity
- Technological disruption by breakthrough science
- Digitalization across the value chain
- Pressure on price for value continues to increase
- Non-traditional new entrants

Market Size 2017

€870bn

4 - 5%

Market CAGR 2018-22e

Source: IQVIA Market Prognosis Update 2018-22 incl. Radiology

/// Bayer Capital Markets Day /// London, December 5, 2018
Innovative Medicines in Areas of High Unmet Medical Need

**Therapeutic area focus**

- Hematology
- Ophthalmology
- Oncology
- Radiology
- Women’s Health
- Cardiovascular
- Other

Sales 2017 €16.8bn

**Emerging markets exposure**

- Established Markets
- Emerging Markets 32%

Sales 2017 €16.8bn

**Global leadership in important therapeutic areas**

- No. 1 in Retinal Diseases
- No. 1 in Women’s Health
- No. 1 in Radiology
- No. 2 in Cardiovascular
- No. 2 in Hematology

**Leading Brands**

Emerging markets include Latin America, Asia (w/o Japan, Australia, New Zealand), Africa and Middle East incl. Turkey, Eastern Europe

// Bayer Capital Markets Day // London, December 5, 2018
Continued Sales Growth and Margin Expansion

- Sales growth above industry level
- Successfully launched and commercialized innovative products, with Xarelto and Eylea becoming blockbuster brands
- Disciplined resource allocation
- 2017 EBITDA margin at upper end of guidance corridor of 32-34% – achieved one year earlier than originally planned
- Increase in R&D investment by ~€1 billion p.a. to c.17% of sales

Including Radiology; Sales growth currency and portfolio adjusted; EBITDA margin before special items

51 Bayer Capital Markets Day // London, December 5, 2018
Key Drivers for Growth and Margin Expansion

### Focus on key brands
- Xarelto
- Eylea
- Adempas
- Mirena
- Silvarga
- Kogenate
- Kovaltry
- Xofigo

- ~70% of sales growth (2013 - 2017)

### Focus on key markets

<table>
<thead>
<tr>
<th>Country</th>
<th>Sales 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>€3.7bn</td>
</tr>
<tr>
<td>PR China</td>
<td>€2.0bn</td>
</tr>
<tr>
<td>Japan</td>
<td>€2.0bn</td>
</tr>
<tr>
<td>Germany</td>
<td>€1.5bn</td>
</tr>
<tr>
<td>France</td>
<td>€0.6bn</td>
</tr>
<tr>
<td>Brazil</td>
<td>€0.4bn</td>
</tr>
</tbody>
</table>


### Prudent cost management

<table>
<thead>
<tr>
<th>Category</th>
<th>2013 - 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>COGS</td>
<td>-400 bps²</td>
</tr>
<tr>
<td>M&amp;S</td>
<td>-700 bps²</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>+230 bps²</td>
</tr>
</tbody>
</table>

- Margin¹ up 310 bps (2013 - 2017)

---

¹ EBITDA margin before special items; bps: Basis points, ² as percentage of sales

// Bayer Capital Markets Day // London, December 5, 2018
Focused Leadership Strategy to Deliver Mid-term Targets and to Ensure Long-term Success

2022 Targets for Pharma

- **Sales CAGR 4 - 5%**
  (Basis 2018e of ~€16.8bn)

- **EBITDA-margin >35%**

Focused Leadership

- **Relentless Focus**
  - Stringent focus on **key brands** and **markets incl. China**
  - Achieve **category/segment leadership** within **Oncology** and **Cardiovascular**

- **Innovation**
  - Supplement organic pipeline with select **in-licensing** and **bolt-on M&A options**
  - **Transform innovation model** to ensure long-term success beyond **LoEs**

- **Excellence in Execution**
  - Maintain **operational focus**
  - Deliver on **mid-term growth and margin aspirations**
  - Execute **efficiency measures**

---

2022 targets at constant currencies, not including portfolio measures; EBITDA margin before special items; LoE: Loss of exclusivity

// Bayer Capital Markets Day // London, December 5, 2018
Xarelto – Continued Growth of a Leading Anticoagulant

- Most broadly indicated anticoagulant for use in venous and arterial thromboembolic conditions
- A leading pharma brand with global sales of €5.0bn in 2017 incl. sales at Johnson & Johnson
- New CAD/PAD indication launching in EU and the US
- Peak sales potential: >€5.0bn
- Further growth driven by:
  - Under-served patient populations
  - Demographics
  - Shift from warfarin
  - New indications targeting patients currently not treated with anticoagulants

CAD: Coronary artery disease; PAD: Peripheral artery disease
Ex-US sales plus royalty from J&J as reported by Bayer
Xarelto Demonstrates Significant Therapeutic Benefits in CAD/PAD

Potential for Changing the Current Standard of Care

**Efficacy (RRR)**

- **MACE**
  - 24%

- **Stroke**
  - 42%

- **CV Death**
  - 22%

**Safety**

- Low overall bleeding incidence rates, although major bleeding was increased
- No significant increase in fatal or intracranial bleeding

---

// Combination of Xarelto 2.5 mg bid + aspirin 100 mg od compared to aspirin 100 mg od alone (COMPASS)

// Significant reduction in the relative risk for the primary composite of stroke, myocardial infarction and cardiovascular death (MACE)

// 20% improvement in net clinical benefit

// Provides a larger relative risk reduction than dual anti-platelet strategies

// Xarelto is the only oral anticoagulant that is approved for the prevention of atherothrombotic events in patients with CAD or PAD

---


CAD: Coronary artery disease; PAD: Peripheral artery disease; MACE: Major adverse cardiovascular events; CV: Cardiovascular; RRR: Relative risk reduction

1 Net clinical benefit was defined as the composite of stroke, cardiovascular death, myocardial infarction, fatal bleeding or symptomatic bleeding in a critical organ
Eylea – A Leader in Retinal Diseases

- A leader in retinal diseases with global brand sales of €5.2bn in 2017 incl. sales at Regeneron¹

- Approved for the treatment of 5 retinal diseases: wAMD, DME, BRVO, CRVO, mCNV

- Treat and extend dosing regimen with injection intervals of up to 12 weeks or more for wAMD

- Peak sales potential: >€2.5bn²

- Further growth driven by:
  - Continued generation of real-life experience in wAMD across key markets and treatment-naïve patient share gains
  - Market expansion in DME

¹ Marketed by Bayer ex-US only; ² As reported by Bayer
wAMD: Wet age related macular degeneration; DME: Diabetic macular edema; BRVO: Branch retinal vein occlusion; CRVO: Central retinal vein occlusion, mCNV: Myopic choroidal neovascularization
Larotrectinib Provides Novel Tumor-Agnostic Precision Medicine Cancer Therapy

Precision medicine, identifying the right patient for the right treatment

- Larotrectinib (Vitrakvi) is an oral, small molecule, highly selective inhibitor of tropomyosin receptor kinases (TRKs)
- NTRK gene fusions can lead to cancer and are facilitating tumor growth as oncogenic drivers
- Relevant genetic alteration is estimated to occur in about 0.5 - 1.0% of patients with solid tumors
- FDA approved for the treatment of adult and pediatric patients with solid tumors that have a neurotrophic receptor tyrosine kinase gene fusion
- Distinguished science, in-licensed from Loxo Oncology together with 2nd generation TRK inhibitor LOXO-195
- Peak sales potential of >€750 million

Larotrectinib: Neurotrophic receptor tyrosine kinase
Larotrectinib Demonstrates Impressive Anti-Tumor Activity
Activity in a Wide Range of Tumors Associated with NTRK Gene Fusions

Maximum change in tumor size according to tumor type (RECIST)

Objective response rate

Assessment (N=109)

- Objective response rate: 81% (95% CI: 72-88%)
- Best response:
  - Partial response: 63%
  - Complete response: 17%

Lassen, U. et al., ESMO 2018
NTRK: Neurotrophic receptor tyrosine kinase; RECIST: Response evaluation criteria in solid tumors

// Bayer Capital Markets Day // London, December 5, 2018
China is a Growth Engine for Pharma

Sales in PR China in €bn

- 1.3 (2013)
- 1.8 (2015)
- 2.0 (2017)
- ~3.0 (2022 target)

- ~13% CAGR cpa

// Ranked among the top 5 multi-national pharma companies in China

// Targeting sales of ~€3bn in PR China by 2022

// Portfolio of established and innovative drugs matches China’s needs

// Strong growth of key products

// Xarelto and Nexavar entered the National Reimbursement Drug List in 2017

// Glucobay, Adalat, Nimotop, Bayaspirin and Ciprobay listed on China’s Essential Drug List

cpa: Currency and portfolio adjusted

/// Bayer Capital Markets Day /// London, December 5, 2018
Successful Track Record in Innovation

**Growth driver**
- Above industry average output in terms of product sales from pipeline assets launched over last 10 years

**Pipeline quality**
- 100% success rate for phase III development of new molecular entities since 2008
- ~50 projects in clinical development
- More than 70 clinical trials underway with ~28,000 patients enrolled

**Scientific leadership**
- Major success with state-of-the-art anticoagulant Xarelto
- Pioneering sGC-modulators with Adempas as first-in-class product
- Delivered first marketed targeted alpha-therapy, Xofigo

**Stringent focus**
- Focus on areas with greatest potential for breakthrough impact on the lives of patients - Cardiovascular Diseases and Cancer
- Selective R&D activities in Hemophilia, Women’s Health, and Ophthalmology

sGC: Soluble guanylate cyclase

---

// Bayer Capital Markets Day // London, December 5, 2018
Addressing High Unmet Medical Need and Attractive Markets

Cardiovascular Diseases are Still the “Biggest Killers”, While Oncology is the Fastest Growing Market

**Main causes of death (2016)**

<table>
<thead>
<tr>
<th>Cause</th>
<th>Deaths (000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ischemic heart disease</td>
<td>8000</td>
</tr>
<tr>
<td>Stroke</td>
<td>6000</td>
</tr>
<tr>
<td>COPD</td>
<td>4000</td>
</tr>
<tr>
<td>LRT infections</td>
<td>2000</td>
</tr>
<tr>
<td>Dementias</td>
<td>1500</td>
</tr>
<tr>
<td>Lung cancer</td>
<td>1000</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>700</td>
</tr>
<tr>
<td>Road injuries</td>
<td>500</td>
</tr>
<tr>
<td>Diarrhoeal diseases</td>
<td>400</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>300</td>
</tr>
</tbody>
</table>

**Top 5 therapeutic categories**

- **Oncology**: 9.3% CAGR 2017-2021e
- **CNS**: 2.8% CAGR 2017-2021e
- **CV**: 1.8% CAGR 2017-2021e
- **MS/P**: 1.6% CAGR 2017-2021e
- **Anti-infectives**: -0.9% CAGR 2017-2021e

WHO Global Health Observatory Data 2018; Decision Resources Group
COPD: Chronic obstructive pulmonary disease; LRT: Lower respiratory tract; CNS: Central nervous system; CV: Cardiovascular; MS/P: Musculoskeletal/Pain
## Late-stage Pipeline with Progress in Oncology

Darolutamide met Primary Endpoint in Phase III-trial and FDA-approval of Larotrectinib

<table>
<thead>
<tr>
<th>Indication</th>
<th>Status</th>
<th>Commercial Potential</th>
<th>Clinical Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Larotrectinib</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRK-fusion Cancer</td>
<td>FDA approved / in registration</td>
<td>≥750m</td>
<td>Clinical program ongoing</td>
</tr>
<tr>
<td>Prostate Cancer</td>
<td>Phase III (nmCRPC)</td>
<td>≥1bn</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phase III (mHSPC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PSP ≥1bn</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Completed (ARAMIS, nmCRPC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aug 2022e (ARASENS, mHSPC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Darolutamide</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lymphoma</td>
<td>Launched in the US</td>
<td>≥0.5bn</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phase III</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PSP ≥1bn</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Copanlisib</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetic Kidney Disease</td>
<td>Phase III</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PSP ≥1bn</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Completed (CHRONOS-3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>May 2020e (CHRONOS-4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Finerenone</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chronic Heart Failure</td>
<td>Phase III (HFrEF)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phase II (HFpEF)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PSP ≥1bn</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vericiguat</strong></td>
<td></td>
<td>≤0.5bn</td>
<td></td>
</tr>
<tr>
<td>Chronic Heart Failure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phase III (HFrEF)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phase II (HFpEF)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PSP ≥1bn</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Completed (VICTORIA, HFrEF)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>May 2020e (FIDELIO-DKD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jul 2021e (FIGARO-DKD)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NTRK: Neurotrophic receptor tyrosine kinase; nmCRPC: Non-metastatic castration resistant prostate cancer; mHSPC: Metastatic hormone sensitive prostate cancer; HFrEF: Heart failure with reduced ejection fraction; HFpEF: Heart failure with preserved ejection fraction; PSP: Peak sales potential

// Bayer Capital Markets Day /// London, December 5, 2018
Darolutamide is a novel non-steroidal androgen receptor antagonist in development for the treatment of prostate cancer.

- Met primary endpoint of metastasis-free survival in the ARAMIS trial in non-metastatic CRPC.
- Phase III trial in metastatic HSPC (ARASENS) ongoing.
- Potential for differentiation:
  - Differentiated chemical structure.
  - Higher binding affinity.
  - Negligible blood-brain barrier penetration1.

---

1 based on pre-clinical data.
# Expected Launches of Key Pipeline Assets

<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023+</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cardiovascular</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xarelto</td>
<td>CAD/PAD</td>
<td></td>
<td></td>
<td>Ped. VTE treatment (EINSTEIN JUNIOR)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finerenone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vericiguat</td>
<td></td>
<td></td>
<td>Heart failure (HFrEF)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Oncology</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Larotrectinib</td>
<td>TRK-fusion cancer</td>
<td>LOXO-195 TRK-fusion cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Darolutamide</td>
<td>nmCRPC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copanlisib</td>
<td>Lymphoma label expansion (Copanlisib/Rituximab iNHL 2nd line)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>HEM</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Damoctocog</td>
<td>Hemophilia A</td>
<td>Anti-TFPI</td>
<td>Hemophilia</td>
<td></td>
<td></td>
<td>FVIII Gene Therapy</td>
</tr>
<tr>
<td>Anti-TFPI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hemophilia A</td>
</tr>
</tbody>
</table>

First launch in first indication

NTRK: Neurotrophic receptor tyrosine kinase; nmCRPC: Non-metastatic castration resistant prostate cancer; mHSPC: Metastatic hormone sensitive prostate cancer; HFrEF: Heart failure with reduced ejection fraction; HFpEF: Heart failure with preserved ejection fraction; iNHL: Indolent Non-Hodgkin Lymphoma; TFPI: Tissue factor pathway inhibitor; WH: Women’s Health; HEM: Hematology
Bayer Has Unique Access to Targeted Thorium Conjugates, a New Approach for Cancer Treatments

- **α-radiation** is highly energetic and may induce DNA damage leading to cell death
- Other than β-radiation, α-radiation is active over a very short distance only which may increase tissue specificity
- Targeted Thorium conjugates direct α-radiation to tumor cells by specific antibodies
- Thorium-227 is the only commercially viable α-radionuclide for antibody targeted therapy
  - Thorium-227 forms highly stable complexes with chelators
  - Efficacy is independent of antibody internalisation
  - No known mechanism for resistance to α-radiation

**Components:**

- **Antibody**: Targeting the tumor cell
- **Chelator**: Forming highly stable complexes with Thorium
- **Thorium-227**: Killing the tumor cell through α-radiation
## Targeted Thorium Conjugate Platform May Have Potential in Several Oncology Settings

<table>
<thead>
<tr>
<th>Project</th>
<th>Indication</th>
<th>Status</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD-22-TTC</td>
<td>CD-22+ NHL</td>
<td>Phase I</td>
<td>Significant need for new therapeutic options for the treatment of r/r NHL (DLBCL, FL)</td>
</tr>
<tr>
<td>Mesothelin-TTC</td>
<td>Solid tumors expressing mesothelin</td>
<td>Phase I</td>
<td>Mesothelin is overexpressed in the vast majority of pancreatic adenocarcinomas, mesotheliomas and adenocarcinomas of the lung, ovary and the stomach</td>
</tr>
<tr>
<td>PSMA-TTC</td>
<td>mCRPC</td>
<td>Phase I ready</td>
<td>PSMA as a predictive biomarker with high and specific overexpression in prostate cancer cells</td>
</tr>
<tr>
<td>HER2-TTC</td>
<td>HER2+ cancer</td>
<td>Pre-clinical</td>
<td>Potential for treatment of patients resistant/refractory to approved HER2-targeting therapies</td>
</tr>
</tbody>
</table>

// Novel approach for radio-immunotherapies with local effect at the tumor

// Tumor specificity defined by antigen/antibody selection, making TTC a flexible technology platform

// Potential to leverage experience with Xofigo

---

TTC: Targeted Thorium conjugate; NHL: Non-Hodgkin’s lymphoma; DLBCL: Diffuse large b-cell lymphoma; FL: Follicular lymphoma; mCRPC: Metastatic castration resistant prostate cancer; PSMA: Prostate specific membrane antigen; HER2: Human epidermal growth factor receptor 2
Re-alignment of R&D-activities to Increase Sustainable R&D Productivity

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>// Broad set of indications in Oncology, Cardiovascular Diseases and Gynecological Therapies</td>
<td>// Focus on select areas with high unmet medical need in Oncology, Cardiovascular Diseases and Gynecological Therapies</td>
</tr>
<tr>
<td>// Focus on functional and technical expertise</td>
<td>// Focus on deep disease understanding</td>
</tr>
<tr>
<td>// Strong reliance on small molecules</td>
<td>// Broader mechanistic approach beyond therapeutic area focus</td>
</tr>
<tr>
<td>// Majority of assets sourced internally</td>
<td>// Invest in new technologies and capabilities</td>
</tr>
<tr>
<td>// Highly concentrated geographical footprint</td>
<td>// Continue to explore potentially game-changing innovations through LEAPS</td>
</tr>
<tr>
<td>// Internally oriented resource model</td>
<td>// Increased portion of R&amp;D assets to be sourced externally in the future</td>
</tr>
<tr>
<td></td>
<td>// Evolve footprint with more co-location in science hubs</td>
</tr>
<tr>
<td></td>
<td>// Adapt internal cost base to free up funds for sourcing inorganic opportunities</td>
</tr>
</tbody>
</table>
External Innovation and Partnering are Essential Components of Success at Pharma

**Joint Labs**
- Joint Labs: e.g. German Cancer Research Center (DKFZ), Broad Institute

**Consortia**
- Innovative Medicines Initiative (IMI)
- Structural Genomics Consortium (SGC)

**Arm’s Length**
- Accelerator: e.g. Grants4-Initiatives
- Incubator: CoLaborator

**Research Collaborations**
- Multiple projects: e.g., Evotec, Tsinghua University, Peking University, Vanderbilt University, MD Anderson

**License Agreements**
- Pipeline assets: Darolutamide, Larotrectinib, Loxo-195, Vericiguat, FXI-Antisense
- Launched products: Nexavar, Stivarga, Eylea, Adempas

Examples only

// Bayer Capital Markets Day // London, December 5, 2018
First Wave of Breakthrough Investments by LEAPS

Biotech with Bayer and CRISPR Therapeutics as major investors
- $300 million over 5-6 years, associated with $70 million equity of Bayer in CRISPR Therapeutics
- Awarded "No. 1 Most Valuable Pharma Deal 2016" by Pharma Dive

CRISPR/Cas-based DNA-editing
Research focus:
I. Cardiology
II. Ophthalmology
III. Hematology (non-malignant)
IV. Autoimmune diseases
V. Ear diseases
VI. Metabolic diseases

Biotech with Bayer and Versant Ventures as major investors
- $225 million over 4-5 years
- BlueRock selected to Top-30 World Game Changer companies (CB Insights Game Changer Report)

Best-in-class induced pluripotent stem cell therapies using an industry-leading platform
Vision is to cure diseases with significant cell loss and diminished self-repair potential
(Initial) research focus on:
I. Cardiology (heart muscle regeneration after MI or with HF)
II. Neurology (Parkinson's disease)
Further Growth in Sales and Profitability

<table>
<thead>
<tr>
<th>Pharma</th>
<th>2018e</th>
<th>Indicative Guidance 2019</th>
<th>Target 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales/Sales growth</td>
<td>~€16.8bn</td>
<td>~4%</td>
<td>CAGR 4-5%</td>
</tr>
<tr>
<td>EBITDA/EBITDA margin</td>
<td>~€5.6bn</td>
<td>~34%</td>
<td>&gt;35%</td>
</tr>
</tbody>
</table>

2022 targets at constant currencies, not including portfolio measures
EBITDA / EBITDA margin based on EBITDA before special items
We Are Confident for Pharma Also Beyond 2022

**Relentless Focus**

**Innovation**

**Excellence in Execution**

**Until 2022**

- Delivering on mid-term growth and margin aspirations
- Maximizing the potential of the existing portfolio to ensure short- to mid-term growth
- Continued focus on cost management
- Re-alignment of R&D activities to sustain long-term growth beyond LoEs

**2022+**

- Realizing the full value of the portfolio until LoEs
- China to become our largest pharma market
- Growth of Larotrectinib, Darolutamide, Finerenone, Vericiguat and others
- Sourcing of external innovation
- Appropriate management of resources
- Expect business to return to market growth after LoE impact

LoE: Loss of exclusivity
Key Takeaways
Driving Performance and Delivering New Growth Opportunities

1. Mid-term targets project further growth and margin improvement
2. China is a growth engine for Pharma
3. Late-stage pipeline with progress in Oncology
4. Re-alignment of R&D activities to increase sustainable R&D productivity
5. Accelerating sourcing of external innovation

LoE: Loss of exclusivity; nmCRPC: Non-metastatic castration resistant prostate cancer

// Bayer Capital Markets Day // London, December 5, 2018
Experienced Pharmaceuticals Executive Leadership Team

Stefan Oelrich
President, Pharmaceuticals

Reinhard Franzen
Commercial Operations
Europe, Middle East & Africa

Sebastian Guth
Commercial Operations
Americas

Wei Jiang
Commercial Operations
China & Asia Pacific

Heike Prinz
Commercial Operations Japan

Robert LaCaze
SBU Oncology

Stefan Oelrich 1
Strategic Marketing

Joerg Moeller
Research & Development

Michael Devoy 2
Medical Affairs & Pharmacovigilance

Wolfram Carius
Product Supply

Julio Triana
Finance

Christoph Bertram
Human Resources Business Partner

Stefan Gehring
Law, Patents and Compliance Business Partner

1 Stefan Oelrich will additionally take over the lead for PH Strategic Marketing on an interim basis; 2 Additional role as Chief Medical Officer for Bayer AG

/// Bayer Capital Markets Day /// London, December 5, 2018
Our Pipeline Contains ~50 Projects in Clinical Development

<table>
<thead>
<tr>
<th>Phase I (26)</th>
<th>Phase II (13)</th>
<th>Phase III (11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer / TRK Inhibitor (LOXO-195)</td>
<td>Cancer / Radium-223 (α-Emitter)</td>
<td>Prostate Cancer (nmCRPC) / Darolutamide (AR Antagonist)</td>
</tr>
<tr>
<td>Cancer / Rogaratinib (pan-FGFR Inhibitor)</td>
<td>Cancer / Radium (pan-FGFR Inhibitor)</td>
<td>Prostate Cancer (mHSPC) / Darolutamide</td>
</tr>
<tr>
<td>Cancer / PTEFb Inhibitor</td>
<td>Thrombosis / FXI Antisense (IONIS)</td>
<td>Non-Hodgkin Lymphoma / Copanlisib (PI3K Inhibitor)</td>
</tr>
<tr>
<td>Cancer / mIDH1 Inhibitor</td>
<td>Thrombosis / anti-FXIII Antibody</td>
<td>Peripheral Artery Disease / Rivaroxaban (FXa Inhibitor)</td>
</tr>
<tr>
<td>Cancer / ATR Inhibitor</td>
<td>Peripheral Artery Disease / AR-Alpha 2c Receptor Antagonist</td>
<td>Chronic Heart Failure and Coronary Artery Dis. / Rivaroxaban</td>
</tr>
<tr>
<td>Cancer / DHODH Inhibitor</td>
<td>Heart Failure preserved EF / Vericiguat (sGC Stimulator)</td>
<td>Medically II / Rivaroxaban</td>
</tr>
<tr>
<td>Cancer / Regorafenib* (multi-Kinase Inhibitor)</td>
<td>Heart Failure / Fulacimstat (Chymase Inhibitor)</td>
<td>Venous Thromboembolism in Children / Rivaroxaban</td>
</tr>
<tr>
<td>Cancer / Anetumab Rantansine (Mesothelin-ADC)</td>
<td>Chronic Kidney Disease / Fulacimstat</td>
<td>Heart Failure reduced EF / Vericiguat (sGC Stimulator)</td>
</tr>
<tr>
<td>Cancer / Lupidartum Amadotin (C4 Aa-ADC)</td>
<td>Endometriosis / Vilaprisan (S-PR Modulator)</td>
<td>Diabetic Kidney Disease / Finerenone (nst MR Antagonist)</td>
</tr>
<tr>
<td>Cancer / CD22-Targeted Thorium Conjugate</td>
<td>Contraception / Combi IUS: LNG (Progestin) + Indomethacin (NSAID)</td>
<td>Renal Anemia / Molidustat (HIF-PH Inhibitor)</td>
</tr>
<tr>
<td>Cancer / MSLN-Targeted Thorium Conjugate</td>
<td>Hemophilia / anti-TFP-Antibody</td>
<td>Sympt. Uterine Fibroids / Vilaprisan (S-PR Modulator)</td>
</tr>
<tr>
<td>Cancer / CEACAM6 fb Antibody</td>
<td>Obstructive Sleep Apnea / TASK Channel-Blocker</td>
<td></td>
</tr>
<tr>
<td>Cancer / ILDR2 fb Antibody</td>
<td>Persistent Chronic Cough / P2X3 Antagonist 1</td>
<td></td>
</tr>
<tr>
<td>Heart Failure / Vasopressin Receptor Antagonist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chronic Kidney Disease / sGC Activator 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chron. Kidney Disease / Vasopressin V1a Receptor Antag.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulmonary Hypertension / sGC Activator 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anti-coagulation / FXIa Inhibitor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endometriosis / P2X3 Antagonist 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endometriosis / Persist. Chron. Cough / P2X3 Antagonist 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endometriosis / P2X4 Antagonist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endometriosis / Rheumatoid Arthritis / IRAK4 Inhibitor 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hemophilia / FVIII Gene Therapy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute Respiratory Distress Syndrome / sGC Activator 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute Respiratory Distress Syndrome / PEG-ADM Inhaler</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rheumatoid Arthritis / IRAK4 Inhibitor 2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Departments

- **Oncology**
- **Cardiovascular & Kidney Diseases**
- **Gynecology**
- **Hemophilia**
- **Others**

---

// Bayer Capital Markets Day /// London, December 5, 2018
Finerenone May Reduce the Risk of CV-mortality and the Progression of Kidney Disease in Patients with Diabetic Kidney Disease

---

**Key phase II data (ARTS-DN[^1])**

![Graph showing UACR ratio finerenone/placebo to baseline at day 90](image)

- **Dose dependent reduction of proteinuria by finerenone when added to RAS blocker therapy in patients with DKD**

---

- Finerenone is a novel non-steroidal MRA that has greater receptor selectivity and better receptor affinity than existing MRAs (e.g. spironolactone, eplerenone).

- Addressing high unmet medical need.

- Two phase III trials in diabetic kidney disease underway: FIDELIO DKD (CV study) and FIGARO DKD (renal study).

- Potential for differentiation:
  - First-in-class MRA for treatment of DKD.
  - Non-steroidal structure, no interaction with steroid hormone receptors compared to existing MRAs.
  - Low risk of hyperkalemia which prohibits the use of marketed MRAs in DKD.

---

Vericiguat is a Potentially New Treatment Option on Top of Standard of Care for Patients with Heart Failure

---

**Key phase II data (SOCRATES-REDUCED)***

<table>
<thead>
<tr>
<th>Dose</th>
<th>% change in NT-proBNP level from baseline at 12 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLA</td>
<td>0</td>
</tr>
<tr>
<td>1.25 mg</td>
<td>15</td>
</tr>
<tr>
<td>2.5 mg</td>
<td>30</td>
</tr>
<tr>
<td>2.5-5 mg</td>
<td>45</td>
</tr>
<tr>
<td>2.5-10 mg</td>
<td><strong>60</strong></td>
</tr>
<tr>
<td>Pooled</td>
<td><strong>75</strong></td>
</tr>
</tbody>
</table>

---

**Dose-response relationship between vericiguat dose and reduction in NT-proBNP, a surrogate marker for cardiac function**

---

- First-in-class, direct sGC stimulator addressing the NO-sGC-cGMP pathway, a relevant mechanism in heart failure.
- Heart failure is still associated with significant mortality risk despite the availability of new therapeutic options.
- Potential for differentiation:
  - New mode of action to be positioned on top of standard of care.
  - OD dosing and overall favorable safety and tolerability profile.
- Development in collaboration with Merck & Co.

---

sGC: Soluble guanylate cyclase; NO: Nitric oxide; cGMP: Cyclic guanosinemonophosphate; OD: Once daily; PLA: Placebo; NT-proBNP: N-terminal prohormone of brain natriuretic peptide.

---


---

/// Bayer Capital Markets Day /// London, December 5, 2018
Copanlisib is a Differentiated PI3K-inhibitor for the Treatment of Lymphoma

Key phase II data (CHRONOS-1)\(^1\)

Overall response rate in patients with follicular B-cell non-Hodgkin’s lymphoma who had relapsed disease following at least two prior treatments:

<table>
<thead>
<tr>
<th></th>
<th>Copanlisib</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall response rate</td>
<td>59%</td>
</tr>
<tr>
<td>Complete response</td>
<td>14%</td>
</tr>
<tr>
<td>Partial response</td>
<td>44%</td>
</tr>
</tbody>
</table>

Copanlisib had a favorable safety profile with a low rate of severe toxicities overall.

// Phosphatidylinositol-3-kinase (PI3K) inhibitor blocking cellular signal transduction processes crucial for cancer progression

// In development for various forms of lymphoma

// Potential for differentiation:

// Inhibits different isoforms of PI3K

// Intravenous administration, thus lower propensity for serious gastrointestinal toxicity

// Intermittent once weekly dosing

// Launched in the US in 2017 for the treatment of relapsed follicular lymphoma. Registration granted under accelerated FDA approval based on phase II data

\(^1\) Dryling M. et al.: Blood 2017; 130: 2777
Driving Performance and Delivering New Growth Opportunities

Capital Markets Day
London, December 5, 2018

Stefan Oelrich
Head of Pharmaceuticals

Joerg Moeller
Head of Pharmaceuticals R&D
Reinvigorating Our Leading OTC Position

Heiko Schipper
Head of Consumer Health
Disclaimer

Cautionary Statements Regarding Forward-Looking Information

This presentation contains forward-looking statements. A forward-looking statement is any statement that does not relate to historical facts and events, but rather reflects Bayer’s current beliefs, expectations and assumptions regarding the future. This applies, in particular, to statements in this presentation on revenue growth, including product introductions and peak sales potential, synergies, especially in relation to the acquisition and integration of Monsanto Company, portfolio adjustments, cost reduction, financial targets and earnings, cash flow generation, deleveraging and other similar statements relating to future performance, including with respect to the markets in which Bayer is active.

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// Bayer Capital Markets Day // London, December 5, 2018
Global Megatrend through 2050: Growing & Aging Population

Societal need: Preserve and restore health

+2.2bn people\(^1\)

People 60+ more than doubling\(^1\)

>20% of total population\(^1\)

OTC market dynamics\(^2\)

- Long-term growth rates above GDP and CPG industry at 3-4% p.a.
- Growing across categories and geographies
- Driven by favorable consumer trends and Rx-to-OTC switches
- Market profitability above CPG industry benchmarks

Key trends OTC market\(^2\)

- Changing consumer behavior and move to ‘self care’
- Consolidation of traditional pharmacies and shift to drugstores, retail and e-commerce
- Digitalization reshaping marketing, sales, and business models
- Lower entry barriers, increasing competition

GDP: Gross domestic product; CPG: Consumer packaged goods
\(^1\) UNDESA 2017 (United Nations Department of Economic and Social Affairs, Population Division (2017). World Population Prospects: The 2017 Revision)
\(^2\) Market model in-market sales OTC medicines, data from IQVIA, Nicholas Hall
A Leading Player Globally

Built up # 2 OTC Player

ASPIRIN introduced
NA OTC business of Sterling
OTC portfolio Sagmel & Topsun
Merck Consumer Care

1899 1994 2008 2014

1978 2005 2013 2014

Miles Laboratories
Roche Consumer Health
Steigerwald
Dihon

Strong positions in 7 out of Top 10 OTC markets

Top 10 OTC markets¹

1. USA
2. China
3. Germany
4. Japan
5. France
6. Russia
7. Brazil
8. Italy
9. India
10. Canada

¹ PARS database, 2017 OTC market size (value) ranking

// Bayer Capital Markets Day // London, December 5, 2018
### Strong Consumer Brands Built up Over Decades

<table>
<thead>
<tr>
<th>Brand</th>
<th>Category</th>
<th>Age</th>
<th>Sales 2017</th>
<th>CAGR 2013-2017</th>
<th># of studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASPIRIN</td>
<td>Pain, Cardio, Cough &amp; Cold</td>
<td>119</td>
<td>€1,043m</td>
<td>2.6%</td>
<td>88</td>
</tr>
<tr>
<td>Claritin</td>
<td>Allergy</td>
<td>25&lt;sup&gt;1&lt;/sup&gt;</td>
<td>€585m</td>
<td>2.2%</td>
<td>82</td>
</tr>
<tr>
<td>Bepanthen</td>
<td>Dermatology</td>
<td>74</td>
<td>€379m</td>
<td>9.7%</td>
<td>116</td>
</tr>
<tr>
<td>Aleve</td>
<td>Pain</td>
<td>42&lt;sup&gt;1&lt;/sup&gt;</td>
<td>€375m</td>
<td>1.3%</td>
<td>42</td>
</tr>
<tr>
<td>Alka-Seltzer</td>
<td>Digestive Health, Cough &amp; Cold</td>
<td>87</td>
<td>€244m</td>
<td>4.4%</td>
<td>7</td>
</tr>
<tr>
<td>Elevit</td>
<td>Nutritionals</td>
<td>34</td>
<td>€189m</td>
<td>17.1%</td>
<td>6</td>
</tr>
</tbody>
</table>

<sup>1</sup> Rx launch; <sup>2</sup> Past 20 years of clinical data
Building Leading Brands by Applying Science and Marketing Capabilities

ASPIRIN introduced as OTC medicine

1899

Sales figures including Aspirin Cardio

1977

Added to the WHO’s first list of essential medicines

1982

Nobel Prize awarded

1985

Approved for prevention of secondary heart attack and stroke

1990

Recommended for treatment during a suspected heart attack

1999

Sales > €500m

2016

Sales > €1bn

2018

Scintigraphy study proves faster disintegration and easier on the stomach

Approved for prevention of secondary heart attack and stroke

Recommended for treatment during a suspected heart attack

Scintigraphy study proves faster disintegration and easier on the stomach

Sales figures including Aspirin Cardio

85

// Bayer Capital Markets Day // London, December 5, 2018
In Recent Years the Business has not Reached its Full Potential

### Performance 2014-2018

**Sales growth, yoy cpa¹ in %**

<table>
<thead>
<tr>
<th></th>
<th>FY’14</th>
<th>FY’15</th>
<th>FY’16</th>
<th>H1’17</th>
<th>H2’17</th>
<th>H1’18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>5.3</td>
<td>6.1</td>
<td>3.5</td>
<td>0.2</td>
<td>-3.6</td>
<td>-1.8</td>
</tr>
</tbody>
</table>

**EBITDA margin before special items in %**

<table>
<thead>
<tr>
<th></th>
<th>FY’14</th>
<th>FY’15</th>
<th>FY’16</th>
<th>H1’17</th>
<th>H2’17</th>
<th>H1’18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>23.4</td>
<td>24.0</td>
<td>23.4</td>
<td>22.5</td>
<td>19.3</td>
<td>20.2</td>
</tr>
</tbody>
</table>

¹ Currency- and portfolio adjusted

### Key issues

- Low level of innovation
- Outdated marketing and sales approach
- Regulatory issues in China
- Temporary supply interruptions

### Key opportunities

- Create more focus on core OTC portfolio
- Establish leaner, more agile organization
- Lower cost base by applying Zero Based Budgeting
- Leverage stronger our Bayer brand across the portfolio
New Leadership Team with Proven Track Record in OTC and CPG Companies

Heiko Schipper*
President, Consumer Health
Previous: Nestlé

Patrick Lockwood-Taylor*
Commercial Operations NA
Previous: P&G

Stefan Meyer
Commercial Operations EMEA
Previous: P&G, J&J

Lance Yuen
Commercial Operations APAC
Previous: BMS, P&G

Arturo Sanchez
Commercial Operations LATAM
Previous: P&G, Pfizer

Patricia Corsi*
Strategic Marketing & Digital
Previous: Unilever, Heineken

Olivier Mauroy-Bressier
Finance
Previous: Rhône-Poulenc, Aventis

Sharon James*
Research & Development
Previous: Reckitt Benckiser, GSK

John Koelink*
Product Supply
Previous: Organon, Hoechst

Edwin Schenck*
Human Resources
Previous: J&J

Patrick Lockwood-Taylor
Commercial Operations NA
Previous: P&G

Stefan Meyer
Commercial Operations EMEA
Previous: P&G, J&J

Lance Yuen
Commercial Operations APAC
Previous: BMS, P&G

Arturo Sanchez
Commercial Operations LATAM
Previous: P&G, Pfizer

Patricia Corsi*
Strategic Marketing & Digital
Previous: Unilever, Heineken

Olivier Mauroy-Bressier
Finance
Previous: Rhône-Poulenc, Aventis

Sharon James*
Research & Development
Previous: Reckitt Benckiser, GSK

John Koelink*
Product Supply
Previous: Organon, Hoechst

Edwin Schenck*
Human Resources
Previous: J&J

Bill Dodero
Legal
Previous: O'Connor Cohn Dillon & Barr

*Joined Consumer Health in last ~18 months; Patricia Corsi to join in January 2019
Focused on Executing a Comprehensive Turnaround Plan

Focus on winning **Portfolio**

Accelerate growth-focused **Innovation**

Modernize **Marketing & Sales**

Build high-performing **Product Supply**

Leaner and more agile **organization**

Lower **cost base**
We Will Focus on our Core OTC Categories To Leverage our Science and Marketing Capabilities

**Categories to accelerate**

<table>
<thead>
<tr>
<th>Categories</th>
<th>Global Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergy + Cough + Cold</td>
<td>#5</td>
</tr>
<tr>
<td>Nutritionals</td>
<td>#2</td>
</tr>
<tr>
<td>Dermatology</td>
<td>#2</td>
</tr>
<tr>
<td>Pain + Cardio</td>
<td>#4</td>
</tr>
<tr>
<td>Digestive Health</td>
<td>#2</td>
</tr>
</tbody>
</table>

**Main Brands**

- Claritin
- elevit
- Bepanthen
- ALEV
- MiraLAX

**Categories to exit**

- Divestment of Rx Dermatology - US business closed; closing ex-US expected in H2 2019
- Explore exit options for Sun- and Footcare in 2019

---

1 Excluding Derma Rx, Suncare, Footcare
2 PARS database December 2017
3 Subject to the fulfillment of customary closing conditions
Each Region has a Clear Roadmap for Success Coming from Different Starting Points

<table>
<thead>
<tr>
<th>Region</th>
<th>Sales 2017 in €m</th>
<th>Past 2 Year CAGR</th>
<th>Our Roadmap</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>2,480</td>
<td>-2%</td>
<td>Turnaround of largest and most important market</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>738</td>
<td>2%</td>
<td>Rebuild China momentum following regulatory issues</td>
</tr>
<tr>
<td>Europe/Middle East/Africa</td>
<td>1,962</td>
<td>2%</td>
<td>Accelerate growth following temporary supply interruptions</td>
</tr>
<tr>
<td>Latin America</td>
<td>682</td>
<td>10%</td>
<td>Build on leadership position</td>
</tr>
</tbody>
</table>
US Turnaround Plan

Levers and key focus areas

People & Organization
- Increase category and brand building experience
- Drive leaner more agile organization

Winning Portfolio
- Focus our resources on categories where we can win
- Rebuild innovation pipeline

Accelerate growth-focused Innovation
- Rebuild brand fundamentals
- Accelerate digital

Modernized Marketing & Sales
- Right-size the organization
- New leadership team in place

First actions
- Divested Rx Dermatology
- Explore exit options: Suncare / Footcare
- Strengthen innovation for core brands
- Establish Rx-to-OTC switch pipeline
- Step up e-commerce
  - Amazon 2018e sales +60%
  - Online (8.3%) to offline (8.7%) share

Leaner and more agile organization
Accelerating Growth from Innovation

**Ambition 2022**

Double growth contribution from innovation (from 15% to 30% of our growth)

**Strengthen Core Innovation**

**Accelerate Adjacent Innovation**

**Drive new Switch Opportunities**

- Drive consumer-centric innovation
- Un-lock local innovation
- Increase innovation funding
- Explore external partnering

Planning - Pregnancy - Breastfeeding
Modernizing our Brand Building and Sales Capabilities

Brands with Purpose

From Mass to Precision Marketing

Advertising spend on digital

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2018e</th>
</tr>
</thead>
<tbody>
<tr>
<td>18%</td>
<td></td>
<td>28%</td>
</tr>
</tbody>
</table>

Accelerating e-commerce

Growth YTD

<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>60%</td>
<td></td>
<td>37%</td>
</tr>
</tbody>
</table>
### Building Blocks of our Growth Aspiration in 2022

**Goal 2022**

- **Accelerate growth to 3-4%**

**Focus on a winning Portfolio**

- Divest Rx Dermatology, Sun- and Footcare
- Accelerate core OTC range
- Selected bolt-on M&A

**Accelerate growth-focused Innovation**

- Drive consumer-centric innovation
- Un-lock local innovation
- Increase funding & external partnering

**Modernize Marketing & Sales**

- Accelerating e-commerce
- Moving from mass to precision marketing
- Stepping up marketing and sales execution

<table>
<thead>
<tr>
<th>Contribution to Growth Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>~35%</td>
</tr>
<tr>
<td>~30%</td>
</tr>
<tr>
<td>~35%</td>
</tr>
</tbody>
</table>
Build High-Performing Product Supply

Address immediate opportunities...

- Regulatory issues
- Temporary supply interruptions
- Customer service levels

...building up high-performing product supply

Upgrade the manufacturing network
- ~30% less sites\(^1\)
- Upgraded GMP standards
- CAPEX investment 2017/2018e ~€60m

Lower the portfolio complexity
- ~30% less SKUs\(^1\)

Step up supply chain practices
- Increase ‘On Time in Full’
- Reduce write-offs

---

\(^1\) 2022; SKU: Stock keeping unit; GMP: Good manufacturing practice
We Target Efficiencies of ~ €500m\(^1\) Gross by 2022 to Reinvest in Growth and Improve Margins

<table>
<thead>
<tr>
<th>Consumer Health measures</th>
<th>Group measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lean organization</td>
<td>Platform Adjustment</td>
</tr>
<tr>
<td>Delayer to net FTE reduction of ~15%, skewed towards SG&amp;A</td>
<td>Adjust Bayer Corporate Platform</td>
</tr>
<tr>
<td>Flatten organizational structures to accelerate execution</td>
<td></td>
</tr>
<tr>
<td>Re-invest in digital capabilities</td>
<td></td>
</tr>
<tr>
<td>COGS optimization</td>
<td></td>
</tr>
<tr>
<td>Reduce complexity</td>
<td></td>
</tr>
<tr>
<td>CMOs: -30%</td>
<td>Apply zero-based budgeting methodology</td>
</tr>
<tr>
<td>SKUs: -30%</td>
<td></td>
</tr>
<tr>
<td>Increase efficiency</td>
<td>Reduce non-consumer-facing spending</td>
</tr>
<tr>
<td>Write offs: -35%</td>
<td>Identified potentials in e.g. market research, media spend, sponsorships</td>
</tr>
<tr>
<td>Indirect cost optimization</td>
<td></td>
</tr>
<tr>
<td>Write offs: -35%</td>
<td></td>
</tr>
</tbody>
</table>

**Contribution by 2022**
- ~20%
- ~25%
- ~35%
- ~20%

\(^1\) Cumulative efficiencies; CMO = Contract manufacturing organization; SKU = Stock keeping unit

---

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Our Strategic and Operational Roadmap

Strategic focus:
- Put in new leadership team
- Make portfolio choices
- Initiate stricter cost control
- Make necessary impairments
- Execute portfolio choices
- Right-size cost base
- Recover product supply
- Regain momentum in APAC/EMEA
- Reset US cost base to strengthen margin
- Drive higher innovation level
- Accelerate US growth momentum
- Capitalize on portfolio choices
- Realize full benefit of efficiency program

Growth:
- Stabilize growth
- Return to growth
- Accelerate growth

Profitability:
- Stop margin erosion through strict cost controls
- Improve margins
- Accelerate margins
Our Comprehensive Turnaround Will Accelerate Growth and Profitability

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sales growth</strong></td>
<td>-1.7%</td>
<td>PY level</td>
<td>~1%</td>
<td>3 - 4%</td>
<td>~2%</td>
<td>+500 bps.</td>
</tr>
<tr>
<td><strong>EBITDA margin</strong></td>
<td>21%</td>
<td>~20%</td>
<td>~21%</td>
<td>~24%</td>
<td>~6%¹</td>
<td>+300 bps.</td>
</tr>
</tbody>
</table>

2022 targets at constant currencies, including portfolio measures
EBITDA margin based on EBITDA before special items; ¹ CAGR EBITDA before special items
Reinvigorating Our Leading OTC Position
We Have the Right Team and Strategy in Place

1. New leadership team with proven track record of success in OTC and CPG companies
2. Focus on core OTC Portfolio
3. Accelerate innovation to drive growth
4. Modernize marketing and sales to charge our strong brands
5. Build high-performing product supply to increase customer service
6. Create leaner organization and right-size cost base
Reinvigorating Our Leading OTC Position

Capital Markets Day
London, December 5, 2018

Heiko Schipper
Head of Consumer Health
Cautionary Statements Regarding Forward-Looking Information

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Need for Innovation Driven by Megatrends

Producing More with Less: A Fundamental Driver for our Crop Science Business

Growing Population

- +2.2bn people\(^1\)
- +50% more food and feed required to meet growing demand and changing diets\(^2\)

Pressure on Ecosystems

- -17% Harvest losses from climate change\(^3\)
- -20% Significant loss in arable land per capita\(^4\)

Secure a sufficient supply of quality food

Use natural resources more efficiently and responsibly

Societal Needs

Megatrends through 2050

1 UNDESA 2017 (United Nations Department of Economic and Social Affairs, Population Division (2017). World Population Prospects: The 2017 Revision); 2 FAO 2017 (FAO Global Perspective Studies)
Global Corn Yield Rate of Gain must More than Double and Soybean Yield Rate of Gain must Triple by 2030

Trendline Demand Requires Substantive Yield Improvement

Long-term Demand Trendlines

Corn

CAGR = 3.4%

Soybean

CAGR = 3.9%

Incremental corn demand of ~1bn bushels expected in 2018/19 would require 13m additional acres of arable land at constant global yields

Incremental soybean demand of ~600m bushels expected in 2018/19 would require ~14m additional acres of arable land at constant global yields

1 USDA WASDE September 2018, historical data for actual and trendline, trendline based on avg. growth from 2011-2017

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Shaping Agriculture to Benefit Farmers, Consumers and Our Planet
As the Industry Leader Uniquely Positioned to Create Value and Pioneer Tailored Solutions

Our Mission

- Deliver world-class innovation
- Pioneer the digital transformation
- Set new standards of sustainability
- Drive operational excellence

Tailored solutions are key to sustainably managing resources and improving productivity to feed a growing global population
The Established Leader in Crop Science

Grower Endorsement of Excellent Product Portfolio Evidenced by Industry Leading Sales

Broadest Crop Science Product Portfolio

<table>
<thead>
<tr>
<th>Seed &amp; Traits</th>
<th>Crop Protection</th>
<th>Pro-forma acquired divestments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bayer Crop Science¹</td>
<td>20.1</td>
<td></td>
</tr>
<tr>
<td>ChemChina Ag²</td>
<td>14.1</td>
<td></td>
</tr>
<tr>
<td>Corteva</td>
<td>12.7</td>
<td></td>
</tr>
<tr>
<td>BASF Ag³</td>
<td>7.9</td>
<td></td>
</tr>
</tbody>
</table>

¹ The unaudited Pro-forma data are presented as if both the acquisition of Monsanto and the associated divestments had taken place as of January 1, 2017. Sales of Monsanto are presented in periods as per the Bayer fiscal year. One-time effects of business operations, the accounting for discontinued operations and the recognition and measurement of sales from certain business transactions have been adjusted in line with our accounting.

² Excludes non-agro business sales of ADAMA (nutritional supplements, aromatic products, industrial products)

³ Includes BASF Ag Sales 2017 as reported (€5.7bn) plus €2.2bn Pro-forma sales in 2017 from Bayer businesses sold to BASF

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Leading Position in All Major Categories
Crop Science Market\(^2\) Currently Valued at $\sim 90bn // $\sim 3\%$ Long-term CAGR Expected

- **Corn**
  - $\sim 20bn$ market\(^2\)
  - #1 position

- **Soybean**
  - $\sim 15bn$ market\(^2\)
  - #1 position

- **Horticulture\(^1\)**
  - $\sim 15bn$ market\(^2\)
  - #1 position

- **Cereals**
  - $\sim 10bn$ market\(^2\)
  - #1 position

- **Digital Farming**
  - Climate FieldView Digital Platform
  - #1 position

---

\(^1\) Includes fruits, vegetables, flowers and nuts

\(^2\) Includes seeds, traits, crop protection chemistries and environmental science; does not include fertilizer

*Note: Reflecting BCS’ portfolio after divestments. Market sizes rounded to nearest $5bn. Source: Pro-forma calculations Bayer; Bayer CS market model*
World’s Broadest Commercial Footprint in Agriculture

~7,800 Customer-facing Employees with Significant Opportunity to Optimize Portfolio Across Key Regions

Sales 2017¹: €20.1bn

Seed & Trait Technology Acres 2017/2018²: >400m acres (160m ha)

Crop Protection Sales 2017¹: ~€9.5bn

¹ The unaudited Pro-forma data are presented as if both the acquisition of Monsanto and the associated divestments had taken place as of January 1, 2017. Sales of Monsanto are presented in periods as per the Bayer fiscal year. One-time effects of business operations, the accounting for discontinued operations and the recognition and measurement of sales from certain business transactions have been adjusted in line with our accounting. Rounded to the nearest 5%.

² Internal estimates; represents acres containing at least one Bayer seed or biotech trait technologies
Unmatched Investment in R&D
Shaping the Future of Agriculture with Most Productive Innovation Platform in the Industry

#1 *R&D Platform in Crop Science*

// ~7,300 R&D employees

// >35 R&D sites

// >175 breeding locations delivering innovation

// Partner of choice

// Technology provider to the industry

2017 Ag R&D Investment (€bn)$^{1}$

<table>
<thead>
<tr>
<th></th>
<th>Bayer Crop Science</th>
<th>Corteva</th>
<th>ChemChina Ag</th>
<th>BASF Ag</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed &amp; Traits</td>
<td>2.4</td>
<td>1.4</td>
<td>1.2</td>
<td>0.6</td>
</tr>
<tr>
<td>Crop Protection</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^{1}$ Pro-forma estimates based on company information and internal calculations. Bayer Pro-forma figures consider Monsanto acquisition and related divestments. Monsanto calendarized to twelve-month-period ended November 30, 2017.
Next Growth Opportunity: Convergence of Leading R&D Platforms

Extensive Germplasm and Biotech Foundation, Combined with Leadership in Chemistry and Biologicals and Data Science Optimization, Serves As Innovation Engine To Accelerate Benefits Across The Industry

- Leading germplasm libraries in corn, soybean, cotton and vegetables
  - #1 field trial footprint

- Reach >350 m acres annually
- >20 new and next-generation traits in development
- Strong discovery platform for molecules with new mode-of-action and differentiated profiles
- 30-60 molecules selected for field trials annually
- Leader in formulation technology
- >10,000 microbes screened in vitro annually
- 80 m acres of commercial products reached annually in row crops

- #1 database of grower and field trial seed performance data in the industry
- 60 m paid acres in U.S.A., Brazil and Europe represents industry’s leading platform reach

Best positioned to discover, combine and tailor solutions for growers
Driving the Largest and Most Valuable R&D Pipeline in Ag
Highly Effective in Converting Investment into Meaningful Products for Farmers

**Newly Combined Pipeline**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Advancements</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unmatched in the Industry</td>
<td>&gt;70 advancements in 2016 and 2017</td>
<td>Up to €30bn Peak Sales¹</td>
</tr>
<tr>
<td>&gt;75 projects in seed &amp; traits, crop protection and digital ag pipelines</td>
<td>&gt;50 advancements in 2018</td>
<td>Potential to accelerate with combined pipelines</td>
</tr>
<tr>
<td>100’s of new hybrids and varieties commercialized annually</td>
<td></td>
<td>Climate tools serve as an enabler to reach peak opportunity</td>
</tr>
</tbody>
</table>

**Peak Sales Opportunity by Crop**

- **Corn** ~ €11-14bn
- **Soybean** ~ €6-7bn
- **Cereals & Other** ~ €4-5bn
- **Horticulture** ~ €3-4bn

---

¹ Represents non-risk adjusted estimated peak sales for the combined breeding, biotech, crop protection and environmental science pipelines. Applied FX rate of USD/EUR of 1.15

// Bayer Capital Markets Day // London, December 5, 2018
# Expect €17bn in Peak Sales from Recent and Near-Term Launches

## Recent Launches

<table>
<thead>
<tr>
<th>Category</th>
<th>Products/Features</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Corn</strong></td>
<td>Annual germplasm upgrades, BioRise 2 microbial seed treatment, Trecepta insect control trait, Delaro Fungicide, U.S.A.</td>
</tr>
<tr>
<td><strong>Soybean</strong></td>
<td>Annual germplasm upgrades, Roundup Ready 2 Xtend soybean, XtendiMax Herbicide with VaporGrip Technology</td>
</tr>
<tr>
<td><strong>Horticulture</strong></td>
<td>Annual germplasm upgrades (vegetables), Tiviant fungicide, Vayego insecticide</td>
</tr>
<tr>
<td><strong>Cereal and Others</strong></td>
<td>Annual germplasm upgrades, Bollgard II XtendFlex cotton, Bollgard 3 XtendFlex cotton, XtendiMax Herbicide with VaporGrip Technology</td>
</tr>
</tbody>
</table>

*1 Subject to regulatory approvals. Represents a subset of the pipeline; not representative of the entire €30bn peak sales opportunity.*

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FieldView Platform Leads the Digital Transformation in Agriculture
Provides Multiple Ways to Create Value for Farmers, the Industry and the Enterprise

Today: Agronomic services

// Applications that visualize, analyze and recommend
// Driven by data

$1,000 subscription + $300 hardware
// Data Visualization and Storage
// Yield Analysis
// Manual Fertility Scripting
// Manual Seed Scripting
// Field Health Imagery

Per-Acre Offerings
Advanced Seed Scripting  Seed Placement Advisor

Today: FieldView platform¹

50+ partners leverage FieldView platform to bring their digital Ag innovations to farmers, and pay for access to platform

Tomorrow: Enterprise benefit
Driving value across our internal operations and businesses by reducing production costs and enabling outcome-based pricing models to drive incremental sales

// Commercial sales
// Technology
// Business analytics

¹ All trademarks are the property of their respective owners.

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FieldView: The Leading Brand and Platform for Growers

Our Value Creation is Supported by our Performance Trends; Paid Acres >7x Closest Competitor

Global Paid Acres¹

<table>
<thead>
<tr>
<th>Year</th>
<th>FY15</th>
<th>FY16</th>
<th>FY17</th>
<th>FY18e</th>
<th>FY19 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acres</td>
<td>5m</td>
<td>15m</td>
<td>&gt;35m</td>
<td>60m</td>
<td>90m</td>
</tr>
</tbody>
</table>

>35 next-generation projects in the pipeline

Brand Health² (U.S.)

<table>
<thead>
<tr>
<th>Category</th>
<th>FY15</th>
<th>FY16</th>
<th>FY17</th>
<th>FY18e</th>
<th>FY19 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Familiarity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consideration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have Used</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currently Use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Internal estimates  
2 2018 Brand Health Monitor
Opportunity for Digital Transformation and Tailored Solutions

Precise Resource Use and Innovation Required to Address Significant Demand Growth, Field Variability and Increased Pressure On Ecosystems

\[ Y = f(g, e, p) \]

- **g = Genetics**
  - Inherent yield potential in the seed

- **e = Environment**
  - Weather and variability in soil types

- **p = Farming Practices**
  - 40 decisions made over a growing season

**Opportunity from optimized yield equation**

- **542 bu/ac vs. 175 bu/ac national average\(^1\)**
  - 2017 NCGA Corn Yield Contest winner

- **138 bu/ac vs. 49 bu/ac national average\(^1\)**
  - 2017 Soybean Yield Contest winner

**Our evolution to capture the opportunity**

- Leading Products
- Product Combinations
- Digitally Informed Offerings
- Tailored Solutions

---

\(^1\) USDA crop production summary report

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Poised to Solve Grower Challenges and Capture the Opportunity
Leadership in Digital Tools and Innovation Accelerates the Transformation

Significant opportunities ahead

**Digitally informed offerings**

Data science drives more informed decisions for growers and enables outcome-based offerings; 75% of U.S.A. farmers more likely to purchase a product with outcome-based pricing

**FieldView Fungicide Pilot Program**

// ~8 bu/acre\(^1\) more yield when DEKALB\(^\circ\) hybrids used with a fungicide\(^1\)

// 15-20% of U.S.A. corn growers use a fungicide\(^2\)

// **SOLUTION:** Offer outcome-based pricing at defined bu/ac threshold using Climate FieldView; rebate fungicide and application if yield gain is not achieved

**Tailored solutions**

Tailored solutions create new value for farmers beyond the sum of the products, benefit consumers and increase environmental sustainability

**Short-Stature Corn Production System (Phase 2)**

**Benefits**

// Increases precision of crop input applications through extended in-season crop access due to shorter height

// Reduced crop loss from lodging and greensnap due to improved plant stability

// Increased environmental sustainability from optimized use of fertilizer, inputs, land and water

---

\(^1\) Internal R&D trials

\(^2\) USDA NASS 2016/2017 report, figure 2 and internal estimates

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Base Case Targets at Least 30% EBITDA Margin by 2022
Upside Potential in Case of Commodity Cycle Recovery

<table>
<thead>
<tr>
<th></th>
<th>2018e(^1,2)</th>
<th>Indicative Guidance 2019</th>
<th>Target 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales/Sales growth</td>
<td>~€19.3bn</td>
<td>~4%</td>
<td>CAGR &gt;4%</td>
</tr>
<tr>
<td>EBITDA/EBITDA margin</td>
<td>€4.5bn (~23%)</td>
<td>~25%</td>
<td>&gt;30%</td>
</tr>
</tbody>
</table>

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\(^2\) The currency and portfolio adjusted growth rate as compared to the Pro-forma 2017 sales of ~€20.1bn, (excluding transitional service agreement sales) is 3.4%; 2022 targets at constant currencies, not including portfolio measures.

EBITDA / EBITDA margin based on EBITDA before special items
Target Greater than 4% Sales CAGR from 2018 to 2022

Leadership and Innovation Translate into Above Market Sales Growth

Key Sales Growth Drivers

- Deliver annual germplasm refresh across the seeds portfolio to drive price and share gains
- Continue penetration of Roundup Ready Xtend crop system; transition to XtendFlex with expected U.S.A. launch in 2020
- Continue penetration of Intacta RR2PRO; transition to Intacta 2 Xtend with expected launch in South America in 2021
- Increase crop protection sales on the >400m acre seed & trait footprint; FieldView platform an enabler
- Maximize sales synergies

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2 Pending regulatory approvals

1 €19.3bn
Integration on Track and Culture Evolving to Serve our Customers

Leadership in Place and Very Positive Engagement Scores Noted Across Both Legacy Companies

**Cultural Integration Priorities**

1. Build on similarities
   - Center our efforts on shared passion for innovation, science and agriculture

2. Bridge complementary approach
   - Drive work that leverages global scale and respects local needs

3. Actively manage differences
   - Foster courageous decision-making and thorough execution based on data insights

**Achievement-to-Date Highlights**

- **Customer**: Leadership met >2,000 customers in 15 countries
- **Leadership positions**: Top leadership teams named and operational (300 positions), ~50/50 balance of legacy companies represented
- **Cultural activation**: All named leaders engaged in driving integrated culture
- **Exchange**: ~30 leaders based in other legacy company site
- **Cultural integration**: High engagement scores of ~85% at both legacy companies
- **Synergies**: Validated ~€1bn synergies
- **Systems and Processes**: Day One IT fully functional, future integration approach confirmed
- **Governance**: Bayer policy adoption confirmed across crop science

Focus on customers, business continuity and innovation
Targeted Synergies of ~€1bn ($1.2bn) as of 2022

### Cost Synergies

**EBITDA Target**\(^1,2\): ~€870m (~$1bn) as of 2022

<table>
<thead>
<tr>
<th>Year</th>
<th>Cost Synergies</th>
</tr>
</thead>
<tbody>
<tr>
<td>H2 2018</td>
<td>~5%</td>
</tr>
<tr>
<td>2019e</td>
<td>~25%</td>
</tr>
<tr>
<td>2020e</td>
<td>~55%</td>
</tr>
<tr>
<td>2021e</td>
<td>~80%</td>
</tr>
<tr>
<td>2022e</td>
<td>100%</td>
</tr>
</tbody>
</table>

Key Initiatives:
- Commercial and R&D Operations ~0.3bn
- Support Functions & Country Integration ~0.3bn
- Procurement & Product Supply ~0.1bn
- IT infrastructure ~0.1bn

### Sales Synergies

**EBITDA Target**\(^1\): ~€170m (~$200m) as of 2022

- Four countries to generate >60% of the sales synergies
  - U.S.A., Brazil, Argentina and Mexico
- Increase crop protection chemistry sales in Americas on the >400m acre seed & trait footprint; digital ag to serve as an enabler

---

\(^1\) Net EBITDA impact before special items, net of estimated dissynergies such as termination of selected distribution agreements as well as sales disruptions

\(^2\) Majority of one-time costs to achieve synergies expected to be recorded as special items

Applied FX rate of USD/EUR of 1.15

---

Drive operational excellence
Sustainability Engagement to Increase with Broader Impact
Focus on Access Programs and Reducing the Ecological Footprint

Our Engagement Highlights

Access Programs
- Empowering smallholder farmers¹ to reach their full farming potential
- Tools include education, partnerships and tailored solutions

Reduce ecological footprint
- Reducing our environmental footprint throughout our operations by:
  - Systematic reduction of CO2 emissions
  - Water-smart agricultural initiatives
  - Maintaining biodiversity
  - Driving innovative agricultural technologies

Future Targets

Empower >100 million smallholder farmers by 2030
- Enhancing social innovation (e.g. with Better Life Farming) and digital transformation with FarmRaise

Advance a carbon-neutral future of agriculture
- Climate-smart practices (no-tillage, highly productive crops, cover crops, precision agriculture); share knowledge and technologies

Significant reduction of inputs/ha through digital and biotech
- Climate FieldView for precision application of pesticides / fertilizers
- Intacta RR2 Pro soybean technology reduces insecticide use by 90%

¹ With farms less than 2 hectares in size and relying mainly on family labor

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We set high ethical standards for ourselves and our partners.

We serve farms of all sizes to make our innovations accessible.

We encourage diversity in agricultural practices.

We prioritize inclusion and diversity in our company.

We are committed to transparency and dialogue.

We are passionate about collaborating with others to find better solutions.
Key Takeaways

Shaping agriculture to benefit farmers, consumers and our planet

1. Successfully integrate Monsanto and strengthen leadership position in Crop Science
2. Deliver world class innovation from industry’s leading R&D pipeline
3. Pioneer the digital ag transformation with FieldView platform
4. Deliver financial targets through operational excellence, new technologies and synergy benefits
5. Set new standards of sustainability
6. Commit to responsibility, transparency and dialogue
Excited and Engaged Crop Science Executive Leadership Team

Working Together to Deliver Better Solutions for Growers, Consumers and the Planet

Liam Condon
President, Crop Science

Brett Begemann
Commercial Operations

Dirk Backhaus
Product Supply

Bob Reiter
Research & Development

Frank Terhorst
Crop Strategy & Portfolio Management

Jesus Madrazo
Agricultural Affairs & Sustainability

Michael Schulz
Finance

Michael Stern
Digital Farming / Climate Corporation

Martin Dawkins
Post-Merger Integration

Gabriele Oehlschlaeger
Human Resources Business Partner

Lars Benecke
Law, Patents & Compliance Business Partner

James Swanson
IT Business Partner / Digital Transformation
Shaping the Future of Agriculture

Capital Markets Day
London, December 5, 2018

Liam Condon
Head of the Crop Science Division
Disclaimer

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/// Bayer Capital Markets Day /// London, December 5, 2018
Agenda

// 1  The Case for Investment
// 2  Global Ag Market Snapshot
// 3  Planting Decisions
// 4  Creating Solutions for Farmers
// 5  Appendix
Need for Innovation Driven by Megatrends

Producing More with Less: A Fundamental Driver for our Crop Science Business

**Growing Population**

- +2.2bn people\(^1\)
- +50% more food and feed required to meet growing demand and changing diets\(^2\)

**Pressure on Ecosystems**

- -17% Harvest losses from climate change\(^3\)
- -20% Significant loss in arable land per capita\(^4\)

**Societal Needs**

- Secure a sufficient supply of quality food
- Use natural resources more efficiently and responsibly

---

\(^1\) UNDESA 2017 (United Nations Department of Economic and Social Affairs, Population Division (2017). World Population Prospects: The 2017 Revision); \(^2\) FAO 2017 (FAO Global Perspective Studies)

Land is Precious

Only 3% of Earth’s Surface is Arable Land that’s Able to be Farmed

- **Arable Land**: 3%
- **Pasture**: 8%
- **Forest**: 11%
- **Water**: 71%

### Arable Land per Person in m²

<table>
<thead>
<tr>
<th>Year</th>
<th>Industrialized Countries</th>
<th>Developing Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>5,200 m²</td>
<td>2,500 m²</td>
</tr>
<tr>
<td>1970</td>
<td>3,900 m²</td>
<td>3,700 m²</td>
</tr>
<tr>
<td>1990</td>
<td>2,900 m²</td>
<td>5,300 m²</td>
</tr>
<tr>
<td>2010</td>
<td>2,200 m²</td>
<td>7,000 m²</td>
</tr>
<tr>
<td>2030</td>
<td>1,900 m²</td>
<td>8,600 m²</td>
</tr>
<tr>
<td>2050</td>
<td>1,700 m²</td>
<td>9,000 m²</td>
</tr>
</tbody>
</table>

In developing countries, the amount of arable land per person will be falling by more than 60 percent (1960-2050).

Population in billions:

- 1960: 5.5 billion
- 2000: 1.7 billion
- 2050: 9.0 billion

Amount of usable land per person in m² in comparison to a 7,140m² football field (rounded figures):

- **Industrialized Countries**:
  - 1960: 7,000 m²
  - 2000: 4,800 m²
  - 2050: 4,000 m²

- **Developing Countries**:
  - 1960: 3,300 m²
  - 2000: 1,900 m²
  - 2050: 1,400 m²

*Note: Figures are rounded for simplicity.*
Trendline Demand Requires Substantive Yield Improvement

Global Corn Yield Rate of Gain must More than Double and Soybean Yield Rate of Gain must Triple by 2030

Long-term Demand Trendlines

**Incremental corn demand of ~1bn bushels expected in 2018/19 would require 13m additional acres of arable land at constant global yields**

**Incremental soybean demand of ~600m bushels expected in 2018/19 would require ~14m additional acres of arable land at constant global yields**

---

1 USDA WASDE September 2018, historical data for actual and trendline, trendline based on avg. growth from 2011-2017

// Bayer Capital Markets Day // London, December 5, 2018
Agriculture Sales by Crop And Input
Corn and Soybean Lead in Value of Inputs; Cereals in Acreage

Total Ag Input Market: By Input
Total Market Value €90bn
- Fungicides: 13%
- Seeds and Traits: 16%
- Insecticides: 27%
- Herbicides: 44%

Total Ag Input Market: By Crop
Total Market Value €90bn
- Cereals: 17%
- Corn: 23%
- Soybean: 19%
- Horticulture: 12%
- Others: 11%

Planted Area: By Crop, in %
~ 2bn ha (2017)
- Cereals: 34%
- Corn: 27%
- Soybean: 16%
- Horticulture: 14%
- Others: 12%
- Rice: 13%

~3% Annual Growth

Our focus crops of corn, soybean, cereals and horticulture account for ~70% of the market value and acres planted

1 Total market of €90bn includes €5bn of Environmental Sciences; actual pie charts exclude that amount, as not relevant in these views
Source: Bayer CS market model

/// Bayer Capital Markets Day /// London, December 5, 2018
Global Stock-to-Use Ratios for Wheat and Corn Expected to Decline

Ratios Indicate Improving Market Dynamics in the Short-to-Medium Term

Source: USDA-PSD/WASDE, November 2018. Average farm price is for the U.S.A. Production value from IHS Markit

/// Bayer Capital Markets Day /// London, December 5, 2018
Tailored Solutions to Address Farmers’ Individual Needs and Challenges

We know growers...

…make approximately **40 key decisions** every season

…want to grow the **best seed varieties**, and minimize **pests, diseases & weeds**

…want to balance **societal, economic & environmental needs**

**Continuous innovation to drive environmentally sustainable, profitable, high-quality crops**

A combination of products, technologies and services to constitute an individualized solution with unique value for our customers.
## Growers Face ~40 Key Decisions Each Growing Season

Digital tools and a Broad Portfolio of Solutions Allow Growers to Optimize Those Decisions

| Planning          | Pre-Planting          | Planting                     | In-Season                  | Harvest           |
|-------------------|-----------------------|------------------------------|----------------------------|-------------------|-------------------|
| Production Planning | Production Planning | Seed Depth                   | Keep Stand or Re-Plant     | Equipment         |
| Crop Rotation     | Fertility Program     | Planting Speed Through the Field | Post-Emergent Herbicide Application | Timing           |
| Weed Control Program | pH Management       | Other Planting Operation Decisions | Foliar Insect Control     | Storage           |
| Row Spacing       | Burn-Down Program    | Plant Population             | Fertility Program         | Post-Harvest Assessment |
| Product Selection | Tillage Level        | Starter Fertilizer           | Foliar Disease Control    | Crop-Marketing Support |
| Refuge Options    | Primary Tillage Program | Herbicide Application   | Irrigation Application In-Season |                   |
| Plant Population  |                       | Soil Insecticides            | Micronutrients/Fertility Management |                   |
| Seed Treatment    |                       | Fungicide Application-in-Furrow |                           |                   |
| Soil Insecticides |                       | Product Selection In-Field   |                           |                   |
| Soil Nematicides  |                       |                              |                            |                   |
Economics Highly Influence Farmer Decision Making…

2018 Indicative Variable Grower Production Cost Budget Examples

**Corn – U.S.A.**
Total ~ $840/ha or $340/acre

**Soybean – U.S.A.**
Total ~ $270/ha or $110/acre

**Wheat – France**
Total ~ 1050 $/ha or $425/acre

Source: USDA Forecast 2018
…as do Location and Timing

Decisions Take into Account Both Time of Year and Climate

**Corn**
- United States [35 %] ³
- Brazil (Safrinha Crop) [8 %] ³

**Soybean**
- United States [33 %] ²
- Brazil [30 %] ²

**Wheat**
- Europe (Winter) [21 %] ¹
- Australia (Winter) [3 %] ¹

Seeds are typically sold up to 6 months prior to planting start

Crop Protection buying season starts prior to planting, and continues throughout the plant growth phase until shortly before harvest

¹ Percentage refers to the global share of production (avg. 2013-2017) - EU/Australia figures refer to total (spring & winter) wheat production
² Percentage refers to the global share of production (avg. 2013-2017)
³ Percentage refers to the global share of production (avg. 2013-2017); Brazil refers to total (1st & 2nd Crop) Corn production

/// Bayer Capital Markets Day /// London, December 5, 2018
Tailored Solutions Enable Optimal Grower Productivity

Optimizing Decisions for Growers to Produce More with Less

Superior products and use of digital tools like Climate FieldView across the Brazil soybean season

Tailor-made customer solutions holistically enhance yield and sustainability, ensuring safe, healthy, and affordable food
Key Takeaways
Shaping Agriculture to Benefit Farmers, Consumers and our Planet

1. Climate and population trends, combined with finite resources, demand innovation in Ag.
2. Our focus is in the leading crops within the growing €90bn global Ag input market.
3. Farmers make over 40 key decisions a season; our goal is to help them optimize with the best solution on every acre.
4. We maintain strong competitive advantages in creating the leading seed, biotech trait and crop protection chemistry solutions.
Introduction to Agriculture

Capital Markets Day
London, December 5, 2018

Frank Terhorst
Head of Crop Science Strategy and Portfolio Management
Appendix

Reference Materials
Highest Corn Yields in U.S.A.

Majority of Global Corn is used for Feed

**Corn Yields (bu/ac)**

<table>
<thead>
<tr>
<th>Country</th>
<th>Yields (bu/ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>World avg.</td>
<td>93</td>
</tr>
<tr>
<td>U.S.A.</td>
<td>181</td>
</tr>
<tr>
<td>European Union</td>
<td>118</td>
</tr>
<tr>
<td>China</td>
<td>98</td>
</tr>
<tr>
<td>Brazil</td>
<td>86</td>
</tr>
<tr>
<td>India</td>
<td>45</td>
</tr>
</tbody>
</table>

**Corn Use**

<table>
<thead>
<tr>
<th>Use</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed</td>
<td>59%</td>
</tr>
<tr>
<td>Biofuel</td>
<td>18%</td>
</tr>
<tr>
<td>Food</td>
<td>13%</td>
</tr>
<tr>
<td>Other</td>
<td>10%</td>
</tr>
</tbody>
</table>

**Major Corn Growing Countries (harvested acres)**

- **China**: 90.2m (20%)
- **U.S.A.**: 81.8m (43%)
- **European Union**: 20.4m (4%)
- **India**: 22.7m (18%)
- **Brazil**: 43.2m (10%)
- **Other**: 195.8m (5%)

1 USDA, Foreign Agricultural Service, Corn Area, Yield and Production as of 2018-10-11; 2018/19 Projections Oct
2 OECD-FAO Agricultural Outlook 1990-2028; year 2017
3 U.S.A. Corn planted acres: 89.1m (2018/19 Projections Oct)

// Bayer Capital Markets Day /// London, December 5, 2018
Americas the Highest Yielding, Key Growing Region for Soybeans

**Soybean Yields (bu/ac)**

<table>
<thead>
<tr>
<th>Country</th>
<th>Yield (bu/ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>World avg.</td>
<td>42</td>
</tr>
<tr>
<td>U.S.A.</td>
<td>53</td>
</tr>
<tr>
<td>Brazil</td>
<td>48</td>
</tr>
<tr>
<td>Argentina</td>
<td>45</td>
</tr>
<tr>
<td>China</td>
<td>27</td>
</tr>
<tr>
<td>India</td>
<td>14</td>
</tr>
</tbody>
</table>

**Major Soybean Growing Countries (harvested acres)**

- **Brazil**: 92.7m
- **China**: 20.8m
- **India**: 27.2m
- **Argentina**: 47.0m
- **U.S.A.**: 88.3m
- **Other**: 43.9m

**Soybean Use**

- Crush (Meal and Oil): 89%
- Food: 5%
- Feed: 1%
- Other: 5%

---

1 USDA, Foreign Agricultural Service, Wheat Area, Yield and Production as of 2018-10-11; 2018/19 Projections Oct
2 OECD-FAO Agricultural Outlook 1990-2028; year 2017
3 U.S.A. Soybean planted acres: 89.1m (2018/19 Projections Oct)
A Quarter of Global Soybean Production Goes to China

China Tariff on U.S.A. Soybean Expected to Impact Global Trade Flows

United States

<table>
<thead>
<tr>
<th></th>
<th>2018/19 mMT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand</td>
<td>60.1</td>
</tr>
<tr>
<td>Production</td>
<td>127.6</td>
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<tr>
<td>Exports</td>
<td>56.1</td>
</tr>
</tbody>
</table>

Argentina

<table>
<thead>
<tr>
<th></th>
<th>2018/19 mMT</th>
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<tbody>
<tr>
<td>Demand</td>
<td>47.9</td>
</tr>
<tr>
<td>Production</td>
<td>57.0</td>
</tr>
<tr>
<td>Imports</td>
<td>2.2</td>
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<tr>
<td>Exports</td>
<td>8.0</td>
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Brazil

<table>
<thead>
<tr>
<th></th>
<th>2018/19 mMT</th>
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</thead>
<tbody>
<tr>
<td>Demand</td>
<td>46.2</td>
</tr>
<tr>
<td>Production</td>
<td>120.5</td>
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<tr>
<td>Exports</td>
<td>75.0</td>
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</tbody>
</table>

E.U.

<table>
<thead>
<tr>
<th></th>
<th>2018/19 mMT</th>
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</thead>
<tbody>
<tr>
<td>Demand</td>
<td>18.3</td>
</tr>
<tr>
<td>Production</td>
<td>2.7</td>
</tr>
<tr>
<td>Exports</td>
<td>15.8</td>
</tr>
</tbody>
</table>

China

<table>
<thead>
<tr>
<th></th>
<th>2018/19 mMT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand</td>
<td>110.6</td>
</tr>
<tr>
<td>Production</td>
<td>15.0</td>
</tr>
<tr>
<td>Imports</td>
<td>94.0</td>
</tr>
</tbody>
</table>

Imports:
- 28% from U.S.A
- 66% from BRA
- 2% from ARG

World

<table>
<thead>
<tr>
<th></th>
<th>2018/19 mMT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand</td>
<td>353.0</td>
</tr>
<tr>
<td>Production</td>
<td>369.5</td>
</tr>
</tbody>
</table>

---

P USDA, World Agricultural Supply and Demand Estimates, October 11, 2018; 2018/19 Projections Oct

R Strategie Grains, October 25, 2018; Crop Year: 2017/18

mMT = million Metric Tons

---

// Bayer Capital Markets Day // London, December 5, 2018
The U.S.A. is a Major Supplier of Global Corn and Soybean

### Corn Supply
- Million Acres Planted: 89.1
- Million Acres Harvested: 81.8
- Billion Bushels Produced: 14.8
- Billion Bushels Imports and Stocks: 2.2
- Billion Bushels Total Supply: 17.0

### Soybean Supply
- Million Acres Planted: 89.1
- Million Acres Harvested: 88.3
- Billion Bushels Produced: 4.7
- Billion Bushels Imports and Stocks: 0.5
- Billion Bushels Total Supply: 5.2

Source: USDA, World Agricultural Supply and Demand Estimates, October 11, 2018; 2018/19 Projections Oct
Wheat: Largest Global Staple Crop by Acreage

Only Conventional Varieties Grown

**Wheat Yields (bu/ac)**

- World avg.: 50
- China: 80
- European Union: 80
- India: 49
- U.S.A.: 48
- Russia: 40

**Major Wheat Growing Countries (harvested acres)**

- India: 74.1m
- Russia: 64.2m
- European Union: 63.3m
- Other: 235.4m

**Wheat Use**

- Food: 68%
- Feed: 19%
- Biofuel: 2%
- Other: 11%

---

1 USDA, Foreign Agricultural Service, Wheat Area, Yield and Production as of 2018-10-11; 2018/19 Projections Oct
2 OECD-FAO Agricultural Outlook 1990-2028; year 2017

/// Bayer Capital Markets Day /// London, December 5, 2018
2016 Crop Protection Market by Crop and Segment
Corn / Soybean

**Corn Crop Protection Market**
- Fungicides: 11%
- Insecticides: 20%
- Herbicides: 69%
- Other: 1%
- Total: $5.6bn

**Soybean Crop Protection Market**
- Fungicides: 28%
- Insecticides: 32%
- Herbicides: 39%
- Other: 1%
- Total: $7.8bn

2016 Crop Protection Market by Crop and Segment

Cereals / Cotton

Cereals Crop Protection Market

- Herbicides: 50%
- Fungicides: 36%
- Insecticides: 9%
- Other: 5%

Total: $7.9bn

Cotton Crop Protection Market

- Herbicides: 58%
- Fungicides: 12%
- Insecticides: 6%
- Other: 24%

Total: $2.5bn

2016 Crop Protection Market by Crop and Segment

Fruit & Vegetables / Rice

Fruit & Vegetables Crop Protection Market

- Herbicides: 41%
- Fungicides: 34%
- Insecticides: 22%
- Other: 3%

$12.6bn

Rice Crop Protection Market

- Herbicides: 41%
- Fungicides: 35%
- Insecticides: 22%
- Other: 2%

$4.8bn


// Bayer Capital Markets Day // London, December 5, 2018
Leading Corn Seed and Trait Products and Brands

**United States**

**BRANDED SEED PRODUCTS:**
- SmartStax RIB Complete
- VT Double PRO RIB Complete
- VT Triple PRO RIB Complete
- DroughtGard VT Double PRO RIB Complete
- Trecepta (offered with VT Double PRO)
- Roundup Ready Corn 2

**SEED BRANDS:**
- DEKALB
  - Regional:
    - Fontanelle Hybrids - NE
    - Gold Country Seed - MN
    - Hubner Seed – East U.S.A.
    - Jung Seed Genetics - WI
    - Kruger Seeds - IA
    - Lewis Hybrids - MO
    - REA Hybrids – North U.S.A.
    - Stewart – IN, KY and OH
    - Stone Seed – IL
    - Specialty – IN and MI
    - Channel (direct)

**LICENSED CORN GERMLASM**
- Corn States

---

**Brazil**

**BRANDED SEED:**
- VT Triple PRO
- VT Double PRO
- VT PRO
- Refuge MAX (Roundup Ready only)

**SEED BRANDS:**
- DEKALB
  - Regional:
    - Agroeste
    - Sementes Agroceres

---

**Argentina**

**BRANDED SEED:**
- VT TRIPLE PRO
- YieldGard RR2
- Roundup Ready Corn 2

**SEED BRANDS:**
- DEKALB
  - Regional:
    - La Tijereta

---

**E.U.**

**BRANDED SEED**
- Conventional

**SEED BRANDS:**
- DEKALB
Leading Soybean and Cotton Seed and Trait Products and Brands

**United States**

**Soybean**
- **BRANDED SEED PRODUCTS:**
  - Roundup Ready 2 Xtend
  - Roundup Ready 2 Yield
- **LICENSED SOYBEAN GERMLASM**
  - Corn States
- **LICENSED CORN GERMLASM**
  - Corn States
- **SEED BRANDS:**
  - Asgrow
  - Regional:
    - Fontanelle Hybrids - NE
    - Gold Country Seed - MN
    - Hubner Seed – East U.S.A.
    - Jung Seed Genetics - WI
    - Kruger Seeds - IA
    - Lewis Hybrids - MO
    - REA Hybrids – North U.S.A.
    - Stewart – IN, KY and OH
    - Stone Seed – IL
    - Specialty – IN and MI
    - Channel (direct)

**Cotton**
- **BRANDED SEED PRODUCTS:**
  - Bollgard II XtendFlex Cotton
  - Roundup XtendFlex Cotton
- **SEED BRANDS**
  - Deltapine
- **LICENSED COTTON GERMLASM**
  - Cotton States

**Brazil**
- **BRANDED SEED PRODUCTS:**
  - Intacta RR2 PRO
- **SEED BRANDS**
  - Monsoy
  - Asgrow
- **LICENSED SOYBEAN GERMLASM**
  - Monsoy

**United States**

**Soybean**
- **BRANDED SEED PRODUCTS:**
  - Roundup Ready 2 Xtend
  - Roundup Ready 2 Yield
- **LICENSED SOYBEAN GERMLASM**
  - Corn States
- **LICENSED CORN GERMLASM**
  - Corn States
- **SEED BRANDS:**
  - Asgrow
  - Regional:
    - Fontanelle Hybrids - NE
    - Gold Country Seed - MN
    - Hubner Seed – East U.S.A.
    - Jung Seed Genetics - WI
    - Kruger Seeds - IA
    - Lewis Hybrids - MO
    - REA Hybrids – North U.S.A.
    - Stewart – IN, KY and OH
    - Stone Seed – IL
    - Specialty – IN and MI
    - Channel (direct)

**Cotton**
- **BRANDED SEED PRODUCTS:**
  - Bollgard II XtendFlex Cotton
  - Roundup XtendFlex Cotton
- **SEED BRANDS**
  - Deltapine
- **LICENSED COTTON GERMLASM**
  - Cotton States

**Australia**
- **BRANDED SEED PRODUCTS:**
  - Bollgard III Roundup Ready Flex Cotton
  - Roundup Ready Flex Cotton

**India**
- **BRANDED SEED PRODUCTS:**
  - Bollgard II Cotton
Bayer is a Global Leading Player in the Vegetable Seed Market

Major Players in Vegetable Seed (sales)\(^1\)

- Other Competitors: 26%
- Rijk Zwaan: 19%
- BASF: 15%
- Limagrain: 18%
- Syngenta: 12%
- Other: 10%
- sweet corn: 19%
- pepper: 18%
- cucumber: 26%
- onion: 10%
- tomato: 15%
- other crops: 12%

\(^1\) Various external sources and internal estimates; 1 USD = 1.19 EUR

Bayer Vegetable Seed sales by crop

152

// Bayer Capital Markets Day // London, December 5, 2018
Our Focus Crops and Regions Align With Global Vegetable Market

Our Leading Crops are Tomatoes, Pepper, Cucumber and Regions are EMEA and North America

Vegetable Growing Regions (Value)¹

- South America: 6%
- North America: 22%
- Asia: 25%
- Europe, Middle East, Africa: 46%

Major Vegetable Crops (Value)¹

- Tomato: 22%
- Pepper: 28%
- Watermelon: 13%
- Carrot: 9%
- Onion: 8%
- Melon: 5%
- Cucumber: 5%
- Other Crops: 4%

¹ Various external sources and internal estimates; 1 USD = 1.19 EUR

/// Bayer Capital Markets Day /// London, December 5, 2018
Developing World-Class Biotech Traits and Crops

Scale and Expertise in Biotech Crop Development Lead the Industry

Trait Development Process (11-12 years)

Discovery
- Gene / Trait Identification
  - High-Throughput Screening for desired characteristic and Early Crop Testing

Phase One
- Proof of Concept
  - Gene Optimization and Demonstration of Product Concept In-Crop

Phase Two
- Early Development
  - Large-Scale Transformation, Commercial Candidate Selection, Pre-Regulatory Data Generation

Phase Three
- Advanced Development
  - Trait Integration, Regulatory Data Generation

Phase Four
- Pre-Launch
  - Regulatory Submissions & Approvals, Seed Bulk-Up, System Testing and Pre-Marketing

Competitive Advantage
- Industry-leading genome & germplasm libraries in house and through collaborations
- Technical expertise to optimize gene expression and performance in-crop
- Ability to rapidly test many gene combinations to evaluate stacks
- Knowledge of optimal genome locations
- Largest global field-testing footprint diversifies geographic data insights
- New traits are introgressed into the most elite germplasm, and stacked with the industry's leading traits
- Global regulatory experience is unrivaled
- Evaluation of agronomic systems (trait, germplasm, chemistry) for product deployment & customer recommendations
Scale and Leading Technology Drives Breeding Crop Development
Optimizing Extensive Germplasm Library to Develop New Capabilities for Better Customer Solutions

- **Germplasm “Galaxy”**
  - Stars represent inbred parents, connector lines represent ancestral relationships
  - Representing breeding in 120+ locations in 25+ countries

- **Enabling Technologies**
  - 90% of NA corn 2018 commercial deployments are impacted by advanced methods
  - Doubled haploids enable scale of breeding pipeline & faster cycle time

- **Sequencing & Selection in Lab**
  - Sequencing chip contains 1K genomes or 14 acres of information enables saving 1 year of testing
  - Pipelines for corn & soybean are 4X & 6X larger than 2012 due to sequencing in the lab

- **Early Pipeline Yield Testing**
  - Testing unique genetic combinations with improved characteristics
  - Data analytics throughout the pipeline to enhance decision making

- **Trait Integration**
  - Corn greenhouse in Arizona scheduled to be online in Spring 2019
  - Enabling faster development of new products in a protected greenhouse environment

- **Pre-commercial Yield Testing**
  - Time savings in the lab enables 2 years of germplasm/trait combination testing in the field
  - Improving customer recommendations, better match products to specific environments

- **8-10 year product development timeline**
Chemical Crop Protection – From Idea to Market

After 10 to 14 years and an average investment of about €250m, one compound reaches the market.
# Glossary of Scientific and Agricultural Terms

## Abiotic Stress
The negative impact of non-living factors on the living organisms in a specific environment. The non-living variable must influence the environment beyond its normal range of variation to affect adversely the population performance or individual physiology of the organism in a significant way. Whereas a biotic stress would include such living disturbances as fungi or harmful insects, abiotic stress factors, or stressors, are naturally occurring, often intangible, factors such as intense sunlight or wind that may cause harm to the plants and animals in the area affected. Abiotic stress is essentially unavoidable. Abiotic stress affects animals, but plants are especially dependent on environmental factors, so it is particularly constraining. Abiotic stress is the most harmful factor concerning the growth and productivity of crops worldwide. Research has also shown that abiotic stressors are at their most harmful when they occur together, in combinations of abiotic stress factors.

## Agriculture
The art and science of cultivating the ground, including the harvesting of crops and the rearing and management of livestock.

## Agronomy
A branch of agriculture dealing with field-crop production and soil management.

## Biodiesel
An alternative to standard diesel fuel, this clean-burning, renewable fuel is created by combining methanol or ethanol (the base) with vegetable oil, such as canola or soybean oil, or animal fat.

## Biodiversity
(Biological diversity) The variation of taxonomic life forms within a given ecosystem, often cited as a measure of the system’s health.

## Biofuel
A fuel derived from organic material that is not fossilized like coal or petroleum. Common sources of biofuel are corn, soybean, sugar cane, flaxseed and rapeseed.

## Biomass
Organic, nonfossil material available on a renewable basis. Biomass includes all biological organisms, and their metabolic byproducts, that geological processes have not yet transformed into fossilized substances.
### Glossary of Scientific and Agricultural Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biotechnology</strong></td>
<td>Applied biological science, as bioengineering or recombinant DNA technology.</td>
</tr>
<tr>
<td><strong>Agricultural Biotechnology</strong></td>
<td>An extension of traditional plant breeding through biotechnology, allowing plant breeders to make precise genetic changes that impart beneficial properties to the crop plants that provide food and fiber. Agricultural biotechnology helps farmers increase yields, enabling them to produce more food per acre and it reduces the need for chemicals, pesticides, water, and tilling; thereby providing benefits to the environment as well as to the health and livelihood of farmers. Through specific design, biotechnology also can be used to enhance the nutritive value of staple foods to improve overall nutrition and health.</td>
</tr>
<tr>
<td><strong>Biotech Crop</strong></td>
<td>A crop grown from seed that has been modified using biotechnology. Often biotech crops provide benefits through reduced need for plowing soil, reduction in pesticides; and added beneficial crop qualities such as vigor and increased yield.</td>
</tr>
<tr>
<td><strong>Bollgard</strong></td>
<td>Trademark for cotton genetically improved to offer protection against common pests, including cotton bollworm, tobacco budworm, and pink bollworm, which can cause significant damage to cotton crops. In-plant pest protection displaces repeated applications of insecticides compared to conventional cotton crops.</td>
</tr>
<tr>
<td><strong>Carbon Footprint</strong></td>
<td>The total amount of greenhouse gases emitted, directly and indirectly, by a natural or manmade system, usually expressed in equivalent tons of carbon or carbon dioxide.</td>
</tr>
<tr>
<td><strong>Carbon/Climate Neutral</strong></td>
<td>A system with no (or minimal) net carbon footprint. Such systems often pair carbon-producing activities with those that reduce or sequester carbon.</td>
</tr>
<tr>
<td><strong>Carbon Sequestration</strong></td>
<td>Any of several processes for the removal of excess carbon dioxide from the atmosphere in an effort to mitigate global warming. Many plants conduct natural biochemical processes that remove carbon from the atmosphere and convert it to biomass. These natural processes can be leveraged in agriculture through conservation tillage.</td>
</tr>
<tr>
<td><strong>Glossary of Scientific and Agricultural Terms</strong></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Carbon Trading</strong></td>
<td>A trading system modeled on a stock exchange that is designed to offset carbon emissions from one activity (such as burning fossil fuels in manufacturing, driving, or flying) with another (such as installing more efficient technologies, planting carbon-sequestering plants, or establishing contracts with others not to partake in carbon-releasing activities).</td>
</tr>
<tr>
<td><strong>Cerrados</strong></td>
<td>The ecologically rich savanna in central Brazil (and some of northeastern Paraguay and eastern Bolivia). Major efforts are underway to preserve this biologically rich savanna.</td>
</tr>
<tr>
<td><strong>Climate Change</strong></td>
<td>Any long-term significant change in the “average weather” that a given region experiences. Average weather may include average temperature, precipitation, and wind patterns. Climate change involves changes in the variability or average state of the atmosphere over durations ranging from decades to millions of years. These changes can be caused by dynamic processes on Earth, external forces including variations in sunlight intensity, and more recently by human activities. (See also Global warming)</td>
</tr>
<tr>
<td><strong>Corn Borer</strong></td>
<td>(Ostrinia nubilalis) A lepidopteran insect that affects production of maize and other crops, including sorghum, cotton, and many vegetables. It causes damage to the aboveground portions (stalk and ear) of maize plants.</td>
</tr>
<tr>
<td><strong>Conservation Tillage</strong></td>
<td>Crop production methods that de-emphasize use of the plow for weed removal and encompass a range of new farming production practices like reduced tillage, or no tillage. In general, these methods all include reduced use of the plow and increased use of crop mulch and cover on the fields. These processes can increase the amount of water in the soil, decreases erosion and increases the amount and variety of soil biota. And they have the potential to aid carbon sequestration by incorporating more plant biomass into the soil.</td>
</tr>
<tr>
<td><strong>Conventional Crop</strong></td>
<td>A non-biotech hybrid or inbred crop grown with inputs, such as fertilizer, herbicides, and insecticides.</td>
</tr>
<tr>
<td><strong>CSR</strong></td>
<td>(Corporate social responsibility) A business outlook that acknowledges responsibilities to stakeholders – including suppliers, customers, employees, local and international communities in which the organization operates, and the natural environment.</td>
</tr>
</tbody>
</table>
### Detasseling
The act of removing the pollen-producing tassel from a corn (maize) plant and placing it on the ground. By removing the tassels from all plants of one variety, all the grain growing on those plants will be fertilized by the another variety's tassels. In addition to being more physically uniform, hybrid corn produces dramatically higher yields than corn produced by open pollination. With modern seed corn the varieties to hybridize are carefully selected so that the new variety will exhibit specific traits found in the parent plants. The detasseling process typically involves the use of specialized machines and human labor.

### Dicamba
(3,6-dichloro-2-methoxybenzoic acid) A herbicide used to control broadleaf weeds. Common herbicides containing dicamba include Clarity Banvel, Oracle and Vanquish.

### Ecological Economics
An interdisciplinary framework that seeks to merge the two historically separate fields of economics and ecology. It assumes that an inherent link exists between the health of the Earth’s ecosystem and the economic system created by human beings; the economy is a subsystem of the earth’s ecological system; and by understanding how each system flows into and out of the other, each can thrive and prosper.

### Ecological Footprint
The total ecological impact of a person or system. The amount of land, food, water, and other resources consumed and generated. Usually measured in acres or hectares of productive land.

### Ecology
A science that studies the Earth and its systems, including the interrelationships of all living things and all elements of their environment.

### Ecosystem
A dynamic and interdependent living community of people, parts or mechanisms that interact with one another.

### Feed
A mixture or preparation of food for feeding livestock.
### Gene Stacked Event

A genetically modified organism (GMO) and all subsequent identical clones resulting from a transformation process are called collectively a transformation event. If more than one gene from another organism has been transferred, the created GMO has stacked genes (or stacked traits), and is called a gene stacked event.

Gene stacked events have become an important topic in plant breeding. Occasionally, researchers wish to transfer more than one trait (e.g. an insect resistance and a herbicide resistance) to a crop. Consequently, they need to transfer more than one gene, and do so either in one or in subsequent steps. This can be achieved either by genetic engineering or by conventional cross-breeding of GM plants with two different modifications.

In most contexts, the difference between a GMO with one new trait and a GMO with several of these is negligible. However, when the GM content of a harvest or any GM product is being measured, stacked genes may have severe consequences. Many countries require the labelling of GM products if the GM share of a single ingredient exceeds certain limits: for example, this limit lies at 0.9 percent in the European Union. Usually, this is analysed by measuring a genetic sequence common to most GMOs. This sequence is transferred along with the gene of interest, when a new GMO is created. A GMO with more than one transgene contains a corresponding number of copies of this sequence. Therefore, measuring the number of copies of this sequence in a food sample would return a figure twice (or more) as high as the actual GMO percentage. Researchers are trying to develop new measuring techniques to overcome this hurdle. Some of these projects are being conducted under the extensive European research programme on co-existence and traceability of GMOs, Co-Extra.

### Genetically Modified Organism

Plants and animals that have had their genetic makeup altered to exhibit traits not intrinsic to the organism. In general, genes are copied from one organism that shows a desired trait and transferred into the genetic code of another organism.

### Fertilizer

Chemical compounds given to plants to promote growth; they are usually applied either through the soil, for uptake by plant roots, or by foliar feeding, for uptake through leaves. Fertilizers can be organic (composed of organic matter), or inorganic (made of simple, inorganic chemicals or minerals). They can be naturally occurring compounds such as peat or mineral deposits, or manufactured through natural processes (such as composting) or chemical processes (such as the Haber process).
### Glossary of Scientific and Agricultural Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Genomics</strong></td>
<td>The science that identifies crop traits and accelerate plant breeding. It is one of the tools used to &quot;mine&quot; germplasm, finding the best combinations of characteristics that can be bred or introduced into plants for better products. Genomics allows the &quot;mapping&quot; of a plant's genes to understand its structure and the role it plays in the plant's function.</td>
</tr>
<tr>
<td><strong>Germplasm</strong></td>
<td>The basic genetic material for any plant, used to develop new seed varieties. Within the germplasm are the basic characteristics that make plants what they are. A seed's genetic material that does not include the genetically modified organisms contained in a trait.</td>
</tr>
<tr>
<td><strong>Global Warming</strong></td>
<td>An aspect of climate change. The increase of temperature in the Earth’s atmosphere and oceans. Global warming is accelerated by the greenhouse gases expelled into the atmosphere from manmade sources. (See also climate change.)</td>
</tr>
<tr>
<td><strong>Glufosinate</strong></td>
<td>Glufosinate is an active ingredient in several nonselective systemic herbicides - Basta, Rely, Finale, Challenge and Liberty. Glufosinate controls both monocot and dicot weeds.</td>
</tr>
<tr>
<td><strong>Glyphosate</strong></td>
<td>A non-selective herbicide used to kill weeds prior to planting and on fields where crops have Roundup Ready technology. It is the primary ingredient in Roundup agricultural herbicides.</td>
</tr>
<tr>
<td><strong>Green</strong></td>
<td>A metaphor referring to environmental association. Often used to associate products, organizations, political parties, or policies with environmental sensitivity.</td>
</tr>
<tr>
<td><strong>Green Tech</strong></td>
<td>A collection of new technologies and approaches that maximize human, environmental, and economic benefits.</td>
</tr>
<tr>
<td><strong>Greenhouse Gas</strong></td>
<td>Gases produced from human activities that trap solar radiation and thus contribute to climate change. These include carbon dioxide (C02), methane (CH3) and hydrofluorocarbons (HFCs).</td>
</tr>
</tbody>
</table>
### Glossary of Scientific and Agricultural Terms

<table>
<thead>
<tr>
<th><strong>Term</strong></th>
<th><strong>Definition</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hybrid</strong></td>
<td>A plant that is heterogeneous; the offspring of two plants of the same species but different varieties.</td>
</tr>
<tr>
<td><strong>Hydrogenation</strong></td>
<td>To add hydrogen to the molecules of an unsaturated organic compound. In processing vegetable oils, hydrogenation results in the conversion of liquid vegetable oils to solid or semi-solid fats. Trans fats are a byproduct of this process.</td>
</tr>
<tr>
<td><strong>Hypoxic Zone</strong></td>
<td>Hypoxia means “low oxygen”. In estuaries, lakes, and coastal waters, low oxygen usually means a concentration of less than 2 parts per million. For example, the Gulf of Mexico hypoxic zone is an area along the Louisiana-Texas coast where water near the sea floor has hypoxic conditions.</td>
</tr>
<tr>
<td><strong>Input</strong></td>
<td>Resources used in agriculture to produce a crop, including seed, fertilizer, herbicide, and insecticide.</td>
</tr>
<tr>
<td><strong>Invasive Species</strong></td>
<td>A species of plant, animal, or fungus that tends to spread unaided in a nonnative ecosystem.</td>
</tr>
<tr>
<td><strong>Marker Genes</strong></td>
<td>Genes coding for particular traits that allow a microorganism to be tracked.</td>
</tr>
<tr>
<td><strong>Metrics Conversion</strong></td>
<td>1 hectare = 2.471044 acres</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>------</td>
<td>------------</td>
</tr>
<tr>
<td><strong>Open-Pollinated</strong></td>
<td>Uncontrolled pollination of a crop by insects, birds, wind, or other natural mechanisms. It can result in seeds and plants of varying quality and hardiness.</td>
</tr>
<tr>
<td><strong>Organic</strong></td>
<td>In food and agriculture, the term generally describes the absence of chemical pesticides, synthetic hormones and fertilizers, and certain other materials in the cultivation of end products.</td>
</tr>
<tr>
<td><strong>Organic Crop</strong></td>
<td>A crop grown without employment of chemically formulated fertilizers, growth stimulants, antibiotics, or pesticides.</td>
</tr>
<tr>
<td><strong>Plant Breeding</strong></td>
<td>The process of working with a plant species to create desired characteristics for specific purposes in successive generations. This process involves either controlled pollination, genetic engineering, or both, followed by artificial selection of progeny.</td>
</tr>
<tr>
<td><strong>Pesticide</strong></td>
<td>A pesticide is a substance or mixture of substances used to kill a pest. A pesticide may be a chemical substance, biological agent (such as a virus or bacteria), antimicrobial, disinfectant or device used against any pest. Pests include insects, plant pathogens, weeds, mollusks, birds, mammals, fish, nematodes (roundworms) and microbes that compete with humans for food, destroy property, spread or are a vector for disease or cause a nuisance. Although there are benefits to the use of pesticides, there are also drawbacks, such as potential toxicity to humans and other animals.</td>
</tr>
<tr>
<td><strong>Renewable</strong></td>
<td>Any material or energy that can be replenished in full without loss or degradation in quality.</td>
</tr>
</tbody>
</table>
Glossary of Scientific and Agricultural Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rootstock</strong></td>
<td>A rootstock is a plant, and sometimes just the stump, which already has an established, healthy root system, used for grafting a cutting or budding from another plant. The tree part being grafted onto the rootstock is usually called the scion. The scion is the plant which has the properties desired by the propagator, and the rootstock is the working part which interacts with the soil to nourish the new plant. After a few years, the tissues of the two parts will have grown together, producing a single tree although genetically it always remains two different plants. The use of rootstocks is most commonly associated with fruiting plants and trees but is the only way to mass propagate many types of plants that do not breed true from seed or are particularly disease susceptible when grown on their own roots. Although grafting has been practiced for many hundreds (if not thousands) of years, most orchard rootstocks in current use were developed in the 20th century.</td>
</tr>
<tr>
<td><strong>Roundup</strong></td>
<td>A brand of agricultural herbicides produced by Monsanto. The properties of Roundup agricultural herbicides and other glyphosate products can be used as part of environmentally responsible weed control programs, including conservation tillage.</td>
</tr>
<tr>
<td><strong>Roundup Ready</strong></td>
<td>A trademark for biotechnology traits that convey in-plant tolerance to glyphosate, enabling growers to spray labeled Roundup branded agricultural herbicides over the top, with excellent crop safety and no yield reduction.</td>
</tr>
<tr>
<td><strong>Seed Production</strong></td>
<td>The process of growing crops to be sold as seed, instead of growing crops to sell as food or feed. Because each seed will become a crop plant, seed production requires high standards for quality and germination.</td>
</tr>
<tr>
<td><strong>Stewardship</strong></td>
<td>Responsible caretaking of products and resources. In ecology, this means making decisions regarding the care of the environment with the goal of passing healthy ecosystems on to future generations.</td>
</tr>
<tr>
<td><strong>Sustainability</strong></td>
<td>Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.</td>
</tr>
<tr>
<td><strong>Sustainable Agriculture</strong></td>
<td>Farming methods that allow the production of crops or livestock without damage to the farm as an ecosystem, including effects on soil, water supplies, biodiversity or other surrounding natural resources.</td>
</tr>
</tbody>
</table>
## Glossary of Scientific and Agricultural Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sustainable Development</strong></td>
<td>A pattern of resource use that seeks to meet human needs while preserving the natural environment so these needs can be met in the present and in the indefinite future.</td>
</tr>
<tr>
<td><strong>Sustainable Management</strong></td>
<td>The ability to direct the course of a company, community, organization, country or any activity that restore and enhance all forms of capital (human, natural, manufactured, and financial) to generate stakeholder value and contribute to the well being of current and future generations.</td>
</tr>
<tr>
<td><strong>Subsistence Farmer</strong></td>
<td>A farmer who grows just enough food for his family’s own needs with little, if anything, left over to sell.</td>
</tr>
<tr>
<td><strong>Trait</strong></td>
<td>An important characteristic of a crop that is determined by a specific gene or set of genes. It generally implies a biotech trait, but not necessarily. A trait is a specific genomic characteristic of a plant variety/hybrid. Non-biotech traits include high oil and waxy corn. Bayer biotech traits include Roundup Ready, Yieldgard Corn Borer, etc.</td>
</tr>
<tr>
<td><strong>Trait Combination, Trait Stacking</strong></td>
<td>The combination or &quot;stacking&quot; of traits allows the farmer to have the value of multiple traits, instead of having to choose between them. Combining traits provides tangible cost and yield advantages to farmers. Within each respective crop, farmers can choose to combine different traits in a single seed, including insect-protection and herbicide tolerance. These product offerings are commonly referred to as &quot;stacked&quot; traits.</td>
</tr>
<tr>
<td><strong>Transgenic</strong></td>
<td>An organism that has acquired traits from another species, as through biotechnology. Although DNA of another species can be integrated in a plant genome by natural processes, the term &quot;transgenic plants&quot; refers to plants created in a laboratory using recombinant DNA technology. The aim is to design plants with specific characteristics by artificial insertion of genes from other species or sometimes entirely different kingdoms. Varieties containing genes of two distinct plant species are frequently created by classical breeders who deliberately force hybridization between distinct plant species when carrying out interspecific or intergeneric wide crosses with the intention of developing disease resistance.</td>
</tr>
</tbody>
</table>
### Transgenic

Resistant crop varieties. Classical plant breeders use a number of in vitro techniques such as protoplast fusion, embryo rescue or mutagenesis to generate diversity and produce plants that would not exist in nature.

Such traditional techniques (used since about 1930 on) have never been controversial, or been given wide publicity except among professional biologists, and have allowed crop breeders to develop varieties of basic food crop, wheat in particular, which resist devastating plant diseases such as rusts. Hope is one such wheat variety bred by E. S. McFadden with a gene from a wild grass. Hope saved American wheat growers from devastating stem rust outbreaks in the 1930s.

Methods used in traditional breeding that generate plants with DNA from two species by non-recombinant methods are widely familiar to professional plant scientists, and serve important roles in securing a sustainable future for agriculture by protecting crops from pests and helping land and water to be used more efficiently.

### Vistive

A Bayer brand of soybean and oilseed rape designed to produce better oils that help meet consumer demand for healthy, great-tasting foods. These oilseeds contain lower levels of linolenic acid, resulting in more stable oil with less need for hydrogenation. The hydrogenation process of soybean produces undesirable trans fats.

### YieldGard

A trademark for biotechnology traits for maize genetically modified to protect against specific lepidopteran pests, such as corn rootworm, corn borer, and others.

### Zero Waste

The goal of developing products and services, managing their use and deployment, and creating recycling systems and markets to eliminate the volume and toxicity of waste and materials, and to conserve and recover all resources.
Excellence in Commercial Integration and Execution

Capital Markets Day
London, December 5, 2018

Brett Begemann / Chief Operating Officer / Crop Science Division
Disclaimer

Cautionary Statements Regarding Forward-Looking Information

This presentation contains forward-looking statements. A forward-looking statement is any statement that does not relate to historical facts and events, but rather reflects Bayer’s current beliefs, expectations and assumptions regarding the future. This applies, in particular, to statements in this presentation on revenue growth, including product introductions and peak sales potential, synergies, especially in relation to the acquisition and integration of Monsanto Company, portfolio adjustments, cost reduction, financial targets and earnings, cash flow generation, deleveraging and other similar statements relating to future performance, including with respect to the markets in which Bayer is active.

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For more information on factors that could cause actual results and future events to differ from those anticipated in forward looking statements, please refer to the factors discussed in Bayer’s public reports which are available on the Bayer website at https://www.investor.bayer.com/en/reports/annual-reports/overview/, including in the Annual Report 2017 under the caption “Report on Future Perspectives and on Opportunities and Risks”.
**Target Greater than 4% Sales CAGR from 2018 to 2022**

Leadership and Innovation Translate into Above Market Sales Growth

### Key Sales Growth Drivers

- Deliver annual germplasm refresh across the seeds portfolio to drive price and share gains
- Continue penetration of Roundup Ready Xtend crop system; transition to XtendFlex with expected U.S.A. launch in 2020
- Continue penetration of Intacta RR2PRO; transition to Intacta 2 Xtend with expected launch in South America in 2021
- Increase crop protection sales on the >400m acre seed & trait footprint; FieldView platform an enabler
- Maximize sales synergies

### 2018e Sales

<table>
<thead>
<tr>
<th>Category</th>
<th>Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn Seed &amp; Traits</td>
<td>25%</td>
</tr>
<tr>
<td>Herbicides</td>
<td>26%</td>
</tr>
<tr>
<td>Fungicides</td>
<td>13%</td>
</tr>
<tr>
<td>Soybean Seed &amp; Traits</td>
<td>12%</td>
</tr>
<tr>
<td>Insecticides</td>
<td>7%</td>
</tr>
<tr>
<td>Environment Science</td>
<td>5%</td>
</tr>
<tr>
<td>Vegetable Seeds</td>
<td>4%</td>
</tr>
<tr>
<td>Other</td>
<td>8%</td>
</tr>
</tbody>
</table>

**€19.3bn**

1 The unaudited Pro-forma data are presented as if both the acquisition of Monsanto and the associated divestments had taken place as of January 1, 2018. Sales of Monsanto are presented in periods as per the Bayer fiscal year. One-time effects of business operations, the accounting for discontinued operations and the recognition and measurement of sales from certain business transactions have been adjusted in line with our accounting. Due to this simplified procedure, they explicitly do not reflect sales according to IFRS or IDW RH HFA 1.004, meaning they have not been audited.

2 Pending regulatory approvals

/// Bayer Capital Markets Day /// London, December 5, 2018
Corn Seed & Trait: Leading Share Position Enhanced by Innovation
Annual Germplasm Upgrade, New Technology Launches and Digital Ag Key to Growth

Germplasm Position and Share¹

<table>
<thead>
<tr>
<th>Region</th>
<th>Position</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.A.</td>
<td>#1</td>
<td>&gt;50%</td>
</tr>
<tr>
<td>Brazil</td>
<td>#1</td>
<td>~45%</td>
</tr>
<tr>
<td>Argentina</td>
<td>#1</td>
<td>~75%</td>
</tr>
<tr>
<td>E.U.</td>
<td>#2</td>
<td>~20%</td>
</tr>
</tbody>
</table>

²018 global trait acres¹ ~110 m

Sales Growth Opportunity Areas: 2018 - 2022

- **INSECT CONTROL:** SmartStax Pro
- **WEED CONTROL:** New herbicide tolerance traits
- **DIGITAL AG:** Climate FieldView
- **SEED GROWTH:** BioRise 2 corn offering and NemaStrike Technology
- **SEED:** Annual launch of ~200 new higher-performing hybrids globally

¹ Internal estimates of branded and licensed germplasm share positions

171 /// Bayer Capital Markets Day /// London, December 5, 2018
Deployed >200 hybrids in 2018
Maintain average >7 bu/acre U.S.A. yield advantage with leading hybrids

Deploy ~200 varieties in 2018
Maintain average ~2 bu/acre U.S.A. yield advantage with leading varieties

Deployed 20 varieties in 2018
Maintain lint/acre U.S.A. yield advantage with leading varieties; 2018 was 81lbs of lint per acre advantage

Deploy ~150 varieties annually; focus in tomatoes and peppers
Focus on disease resistance and yield with new launches

Protect performance with NemaStrike Technology and other seed-applied solutions
Provides for annual price mix gains as growers trade up to higher-performing seeds
Digital Ag becomes proof point for performance advantage
## Leading Go-to-Market Choices Complement Product Performance

~7,800 Customer-facing Employees Meeting Customers Where They Want to Purchase our Products

Digital Ag has the potential to inform and improve our customer relationships and go-to-market strategy

<table>
<thead>
<tr>
<th>GO-TO-MARKET</th>
<th>Value Proposition</th>
<th>Product Performance</th>
<th>Full Season Service</th>
<th>Relationship</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>DEKALB</td>
<td>Channel</td>
<td>U.S.A Regional Brands</td>
<td>U.S.A. Corn States</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Asgrow</td>
<td>Agroeste</td>
<td>Agroceres</td>
<td>Latijereta</td>
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<tr>
<td></td>
<td></td>
<td>Deltapine</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Multi-Brand Strategy ‘Seed’</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>Luna</td>
<td>Velum Prime</td>
<td>Fox</td>
<td>Confidor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alion</td>
<td>Xpro</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Sivanto</td>
<td>Movento</td>
<td></td>
<td>Nativo</td>
</tr>
<tr>
<td>Multi-Brand Strategy ‘Crop Protection’</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channel Strategy ‘Route to Market’</td>
<td></td>
<td>Direct Dealer</td>
<td>Agency</td>
<td>Dealer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Retailer</td>
<td>Dealer</td>
<td>Direct</td>
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<td></td>
<td>Magnum</td>
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</tbody>
</table>

// Bayer Capital Markets Day // London, December 5, 2018
Soybean Seed & Trait: Key Trait Upgrades Expected to Fuel Growth

New Solutions in Insect and Weed Control Provide More Options for Farmers in the Americas

Germplasm Position and Share

- U.S.A. #1 >40%
- Brazil #1 ~20%

2018 global trait acres ~220 m

Sales Growth Opportunity Areas: 2018 - 2022

- INSECT CONTROL: Intacta 2 Xtend
- WEED CONTROL: XtendFlex Soybean
- DIGITAL AG: Climate FieldView
- SEED GROWTH: NemaStrike Technology
- SEED: Annual germplasm upgrade of ~200 higher-performing varieties annually

1 Internal estimates of branded and licensed share positions

/// Bayer Capital Markets Day /// London, December 5, 2018
Roundup Ready Xtend Crop System Continues Record Growth
XtendFlex Soybeans Serve as Next-generation to Provide Tremendous Flexibility in Weed-control Options

Roundup Ready 2 Xtend Soybean

XtendFlex Soybean

Greenville, MS June 2017

Robersonville, NC August 2018

// >40m acres in 2018; expect the Roundup Ready Xtend Crop System for soybean and cotton to grow to 60m acres in 2019
// EPA continues registration of XtendiMax with VaporGrip technology, a low-volatility dicamba formulation for in-crop use
// Potential fit on all soybean acres in North America; broadly licensed to U.S.A. seed companies with >90% share

// Trait combination to provide tolerance to three herbicides; glyphosate, glufosinate and dicamba
// Aligns with the successful approach in Bollgard II XtendFlex cotton
// Stewarded Ground Breakers trials expected in the U.S.A. in 2019, with anticipated launch in 2020

1 Pending regulatory approvals 2 XtendiMax with VaporGrip Technology is a restricted use pesticide

// Bayer Capital Markets Day // London, December 5, 2018
South American Soybean Trait Technologies Continue to Advance

Insect-protected Soybean Technologies Have a Fit on ~100m Acres in South America

---

**Intacta RR2 PRO**

- Exceptional performance, penetrating 60m acres in South America in just five years
- Consistently provides yield advantage and reduces insecticide applications for the primary insect pest in tropical soybean

---

**Intacta 2 Xtend**

- Intacta 2 Xtend trait technology to provide an additional mode of action for insect control and both glyphosate and dicamba tolerance for weed control
- Targeting stewarded trials starting in 2019 and expected launch in 2021¹

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¹ Pending regulatory approvals

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## Herbicides: Capitalize on Opportunities with Leading Portfolio

New Value Capture Concepts Around Integrated Weed Management in a Changing Weed Control Market Environment

<table>
<thead>
<tr>
<th>Global Herbicide Market&lt;sup&gt;1,2&lt;/sup&gt;</th>
<th>Seed &amp; Trait Footprint&lt;sup&gt;3&lt;/sup&gt;</th>
<th>Key Growth Factors</th>
<th>Digital Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop % of Mkt.</td>
<td>Bayer Position&lt;sup&gt;4&lt;/sup&gt;</td>
<td>Bayer % of Planted Acres</td>
<td></td>
</tr>
<tr>
<td><strong>Corn</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>#1</td>
<td>NA</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td><strong>Soybean</strong></td>
<td></td>
<td>#1</td>
<td>LATAM</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cereals</strong></td>
<td></td>
<td>#1</td>
<td>Not relevant</td>
</tr>
</tbody>
</table>

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<sup>1</sup> Global Market: Represents the defined crop’s portion of the global herbicide market. Optimas forecast for Market 2018. Status October 2018

<sup>2</sup> Bayer Indication Position: Agrowin 2017 + estimations for DowDuPont and Bayer divestments split and allocation, Status October 2018;

<sup>3</sup> Bayer S&T Footprint: Internal estimations of percent of planted acres in the region containing at least one seed or trait technology from Bayer

<sup>4</sup> Corn herbicide position is head-to-head with ChemChina
Glyphosate is a Vital and Effective Tool

Every Year, as much as 40% of World’s Potential Harvests are Lost to Pests, Including Weeds

Glyphosate was developed 40+ years ago and is today the most widely used, non-selective herbicide in the world. It is extremely effective in controlling weeds by blocking an enzyme necessary for photosynthesis. When used as directed, glyphosate is not harmful to people and animals.

Benefits of Glyphosate

- In past, farmers controlled weeds by hand
- With mechanization, farmers moved to plowing soil, which contributes to topsoil erosion, and using multiple selective herbicides
- Using glyphosate-based herbicides, farmers can leave soil intact, supporting soil health and reducing greenhouse gas emissions
- Overall, more effective, more sustainable and leads to larger harvests

History of Safe Use

- For 40+ years, overwhelming conclusion of regulators worldwide has been glyphosate can be used safely according to label instructions, including EPA, EFSA, and ECHA
- Extensive body of science (800+ studies over several decades) confirm that glyphosate-based products are safe when used as directed and EPA’s 2018 risk assessment examined more than 100 studies and concluded that glyphosate is not likely to be carcinogenic to humans.
- 160+ countries have approved use of glyphosate

“I need glyphosate on my farm. It helps me be more sustainable, both environmentally and economically, it helps me protect my soil from erosion and build soil health, and it helps me sequester carbon, reducing greenhouse gas emissions…”

Jake Leguee
Leguee Farms, Saskatchewan
Fungicides: Soybean and Horticulture Portfolios Expected to Drive Growth

Securing a Plentiful Supply of High Quality Produce Through Effective Disease Management

<table>
<thead>
<tr>
<th>Crop % of Mkt.</th>
<th>Bayer Position</th>
<th>Bayer % of Planted Acres</th>
<th>Key Growth Factors</th>
<th>Digital Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Horticulture</strong></td>
<td>#2</td>
<td>#1 in vegetable seed sales</td>
<td>Horticulture globally: Growth driven by innovation and portfolio breadth, e.g. Luna, with multi-crop performance and produce shelf-life benefits, and expansion of Nativo and Infinito</td>
<td></td>
</tr>
<tr>
<td><strong>Soybean</strong></td>
<td>#1</td>
<td>LATAM</td>
<td>Soybean in LATAM: Growth driven by Fox and Fox Xpro with performance that addresses rust. Further synergies to capitalize upon with seeds and herbicide portfolio.</td>
<td></td>
</tr>
<tr>
<td><strong>Cereals</strong></td>
<td>#1</td>
<td>Not relevant</td>
<td>Cereals globally: Retaining leading position through breadth of modes-of-action and innovation for sustainable solutions</td>
<td></td>
</tr>
<tr>
<td><strong>Corn</strong></td>
<td>#3</td>
<td>NA</td>
<td>Corn NA: Develop fungicide market through novel business model demonstrating the customer value of Corn fungicides</td>
<td></td>
</tr>
</tbody>
</table>

1 Global Market: Represents the defined crop’s portion of the global herbicide market. Optimas forecast for Market 2018, Status October 2018
2 Bayer Indication Position: Agrowin 2017 + estimations for DowDupont and Bayer divestments split and allocation, Status October 2018;
3 Bayer S&T Footprint: Internal estimations of percent of planted acres in the region containing at least one seed or trait technology from Bayer
Insecticides: Innovation and Portfolio Enable Growth Above Market
Growing Food and Feed Demand, Pest Epidemics and Resistance Challenges Drive Demand

<table>
<thead>
<tr>
<th>Global Insecticide Market¹,²</th>
<th>Seed &amp; Traits Footprint³</th>
<th>Key Growth Factors</th>
<th>Digital Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop % of Mkt.</td>
<td>Bayer Position</td>
<td>Bayer % of Planted Acres</td>
<td>Horticulture globally: Growing demand for high produce quality and addressing nematodes. Further growth with brands like Movento and launch of new innovations like Velum and Sivanto.</td>
</tr>
</tbody>
</table>

**Horticulture**

- #1 in vegetable seed sales

**Soybean**

- #3

**Corn**

- #3

In-season Field Health

---

¹ Global Market: Represents the defined crop’s portion of the global herbicide market. Optimas forecast for Market 2018, Status October 2018
² Bayer Indication Position: Agrowin 2017 + estimations for DowDuPont and Bayer divestments split and allocation, Status October 2018
³ Bayer S&T Footprint: Internal estimations of percent of planted acres in the region containing at least one seed or trait technology from Bayer

---

// Bayer Capital Markets Day // London, December 5, 2018
Seed Growth: NemaStrike Technology Launching

Novel Nematicide Reaches Underserved Market in Launch Across U.S.A. Corn, Soybean and Cotton

Successful NemaStrike Technology Ground Breakers trials in 2018

- ~1,200 growers across corn, cotton and soybean in 2018 trials; represented >10,000 acres
- Expected 2019 product launch across three crops on several million acres
- Continued strong 5 year average yield protection advantage in corn, soybean and cotton

Corn: +5 bu/ac<sup>1</sup>
Soybean: +2 bu/ac<sup>1</sup>
Cotton: +80 lbs lint/ac<sup>1</sup>

<sup>1</sup> Compared to seed treated with Acceleron Seed Applied Solutions without NemaStrike Technology. Results will vary based on nematode pressure in each field. Represents the four-year average from trials conducted in 2014 to 2018

// Bayer Capital Markets Day /// London, December 5, 2018
Seed Growth: NemaStrike Technology Launching
Climate FieldView Imagery Demonstrates the Strong Early Season Performance of the Technology

Climate FieldView imagery and corn root comparison from a NemaStrike Technology Ground Breakers trial

// NemaStrike Technology delivered +12 bu/ac in this trial
// Blue lines represent strip trials with NemaStrike Technology

Products with NemaStrike™ Technology: 157 g
Control: 106.7 g

1 Jackson, MO, 2018
# Key Takeaways

Shaping agriculture to benefit farmers, consumers and our planet

1. Deliver financial targets through operational excellence, new technologies and synergy benefits
2. Provide new value to growers from the annual germplasm refresh across the seeds portfolio
3. Advance new soybean trait technologies across the Americas
4. Seek synergistic opportunities in crop protection and for new product launches on large seed footprint
5. Pioneer the digital Ag transformation in the industry with FieldView platform
Excellence in Commercial Integration and Execution

Capital Markets Day
London, December 5, 2018

Brett Begemann / Chief Operating Officer / Crop Science Division
World Class Innovation Platform

Capital Markets Day
London, December 5, 2018

Bob Reiter
Head of Research & Development
Crop Science Division
Disclaimer

Cautionary Statements Regarding Forward-Looking Information

This presentation contains forward-looking statements. A forward-looking statement is any statement that does not relate to historical facts and events, but rather reflects Bayer’s current beliefs, expectations and assumptions regarding the future. This applies, in particular, to statements in this presentation on revenue growth, including product introductions and peak sales potential, synergies, especially in relation to the acquisition and integration of Monsanto Company, portfolio adjustments, cost reduction, financial targets and earnings, cash flow generation, deleveraging and other similar statements relating to future performance, including with respect to the markets in which Bayer is active.

Although the forward-looking statements contained in this presentation are based upon what Bayer’s management believes are reasonable assumptions, they necessarily involve known and unknown risks and uncertainties that could cause actual results and future events to differ materially from those anticipated in such statements. Forward-looking statements are not guarantees of future performance and undue reliance should not be placed on them. Bayer undertakes no obligation to update forward-looking statements if circumstances or management’s estimates or opinions should change except as required by applicable securities laws.

For more information on factors that could cause actual results and future events to differ from those anticipated in forward looking statements, please refer to the factors discussed in Bayer’s public reports which are available on the Bayer website at https://www.investor.bayer.com/en/reports/annual-reports/overview/, including in the Annual Report 2017 under the caption “Report on Future Perspectives and on Opportunities and Risks”.

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Next Growth Opportunity: Convergence of Leading R&D Platforms

Extensive Germplasm and Biotech Foundation, Combined with Leadership in Chemistry and Biologicals and Data Science Optimization, Serves As Innovation Engine To Accelerate Benefits Across The Industry

Best positioned to discover, combine and tailor solutions for growers
Driving the Largest and Most Valuable R&D Pipeline in Ag

Highly Effective in Converting Investment into Meaningful Products for Farmers

**Newly Combined Pipeline**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Advancements</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unmatched in the Industry</td>
<td>Outpacing Competitors</td>
<td>Up to €30bn Peak Sales¹</td>
</tr>
<tr>
<td>// &gt;75 projects in seed &amp; traits, crop protection and digital ag pipelines</td>
<td>// &gt;70 advancements in 2016 and 2017</td>
<td>// Potential to accelerate with combined pipelines</td>
</tr>
<tr>
<td>// 100's of new hybrids and varieties commercialized annually</td>
<td>// &gt;50 advancements in 2018</td>
<td>// Climate tools serve as an enabler to reach peak opportunity</td>
</tr>
</tbody>
</table>

**Peak Sales Opportunity by Crop**

- **Corn**
  ~ €11-14bn

- **Soybean**
  ~ €6-7bn

- **Cereals & Other**
  ~ €4-5bn

- **Horticulture**
  ~ €3-4bn

¹ Represents non-risk adjusted estimated peak sales for the combined breeding, biotech, crop protection and environmental science pipelines. Applied FX rate of USD/EUR of 1.15
R&D Platforms Supplemented by ‘Open Innovation’ Model

Designed to Ensure Growers have Access to the Best that Science can Offer

- **Internal R&D**
- **Universities & Research Institutes**
- **Customer-sponsored research**
- **Crowdsourcing**
  - Grants4Targets™
  - Grants4Traits™
- **Cross-organizational innovation**
- **Venture Capital**
  - Bayer Growth Ventures
- **Innovation Centers**
- **Technology Collaborations**
  - The BioAg Alliance
  - The Crop Inventors
  - The Crop Innovation Network
  - The Crop Research Council

/// Bayer Capital Markets Day /// London, December 5, 2018
Breeding: Constantly Optimizing Large, Diverse Germplasm Library

Continued Investment in Data Science and New Technologies are Driving Future Opportunity

Advanced Breeding Methods
- Trait integration in the cloud enables better trait combinations even faster
- Key parts of the pipeline are protected and accelerated in the greenhouse

Data Science and Artificial Intelligence
- Apply advanced analytics to every decision
- Partner with Climate to enable next-gen product development

Prescriptive Operations and Logistics
- Better logistics enable innovation in seed testing and product characterization
- Every North American field location is prescribed using analytics
- Manage hundreds of thousands of SKUs

Product Performance Validation
- Prescriptive planting and environmental characterization to maximize product placement
- Integrating and applying imaging to guide decisions
- Globally connected harvest

Tailored Solutions Outcome
- Product recommendations that have been field proven
- Input optimization by product and environment

SKU = Stock Keeping Unit

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Breeding: Strong Yield Performance of Recent Deployment Classes

Technology Advancement is Making a Difference in Corn, Soybean and Cotton Products

**Corn**

- **>7 bu/ac advantage**
- DEKALB outperforms competitive products for the 13th consecutive year
- Consistent 7-10 bu/ac average yield advantage

**Soybeans**

- **~2 bu/ac advantage**
- Asgrow outperforms competitive products for the 9th consecutive year
- Strong performance advantage of ~2 bu/ac on average

**Cotton**

- **81 lbs lint/ac advantage**
- Deltapine outperforms competitive products for the 9th consecutive year
- Data show strong performance advantage of 81 lbs/ac on average

---

1. Bayer estimates – Annual yield advantage calculated each year by comparing 5 leading DEKALB products within each state having a minimum of 100 comparisons to national competitor products containing similar crop protection traits as of November 12, 2018. All comparisons are head-to-head using ±2RMs and weighted average calculated using 15% moisture.
2. Bayer estimates – Annual yield advantage calculated by comparing the top five Roundup Ready 2 Xtend competitor products by volume to the top five performing Asgrow Roundup Ready 2 Xtend products within a +/-0.3 day maturity group as of November 13, 2018. The average across comparisons was weighted based on number of comparisons.
3. Bayer estimates – Data as of November 15, 2018. Yield advantage calculated over three years (2016 to 2018) comparing commercially available leading Deltapine products by region to leading commercially available competitive products with similar traits. A minimum of 6 comparisons within a region were required for inclusion.
Well Positioned to Create Value in Ag with Genome Editing
Tools and Capabilities Build on Existing Core Competencies to Usher in New Benefits in the Next Decade

**Transformative Editing Tools**
Numerous technology licenses and partnerships, including:

**Broad Institute**
RNA-guided nucleases: CRISPR-Cas9 and CRISPR-Cpf1

**Pairwise Plants**
Base editing technology, which is the next-generation of editing capability

**Enabling & Differentiating Competencies**

**Germlasm**
Plant genetics central to leading brand positions in key crops and countries

**Genomics**
Leading genome libraries and whole-genome sequencing capabilities

**Testing Network**
Leading field testing network, wraps around the globe twice

**Unlocking Opportunity**
Bring new products to market: improved silage quality in world-class germplasm

- Current corn germplasm
- Improved Silage edited allele

Deliver future agricultural benefits, including disease resistance, stress tolerance, and plant growth and development
Biotech: A Global Leader in Offering Farmers New Solutions
Current Commercial Biotech Trait Offerings Reach More than 350m Acres Annually

**Leadership Position**

- Using proprietary technology and extensive **Bt libraries** to discover more insecticidal proteins faster than ever
- Includes optimization of expression and the ability to target the selected pests to tailor the solution and the application metagenomics and machine learning
- **Protein expression expertise** that delivers first-ever solution to target a piercing/sucking pest
- **More complex stacks** delivered through improved site directed integration enabled by gene editing
- Focused on superior, sustainable insect and weed control solutions that are **broadly licensed**
- Sustaining and growing the base with **more than 20 new and next-generation traits** in development

**Next Generation Biotech Solutions**

**Example Soybean Herbicide Tolerance**

- **Third-Gen Phase 4**
  - Glyphosate
  - Dicamba
  - Glufosinate

- **Fourth-Gen Phase 2**
  - Glyphosate
  - Dicamba
  - Glufosinate
  - HPPD & another mode of action

- **Fifth-Gen Phase 1**
  - PPO tolerance added to earlier generation tolerance stacks

HPPD = 4-hydroxyphenylpyruvate dioxygenase
PPO = Protoporphyrobin oxidase

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Biotech: Continued Progress in Advancing Next-Gen Insect Control

Near-Term Projects Refresh Insect-Control Options in Corn, Soybeans and Cotton

**Third-Gen, Below-Ground Corn Insect Control**
- 3 modes-of-action for rootworm control
- Novel RNAi mode-of-action
- Tailored trait configurations and product name for each region
- Planned commercial launch early in next decade
- Phase 4
- Acre opportunity of >100m

2017 Idalia, CO

**Second-Gen Soy Insect Control**
- Multiple MOA to improve durability for podworm complex and expands insect spectrum to include armyworm
- 2021 planned commercial launch
- Offers additional herbicide tolerance MOA
- Phase 4
- Acre opportunity of >100m

Uberlandia, Minas Gerais, Brazil 2017/2018

**Lygus and Thrips Control in Cotton**
- First-ever biotech solution for the control of piercing and sucking insect pests, improving yields and reducing insecticide use
- Early next decade commercial launch planned
- Phase 4
- Acre opportunity of >10m

Treated Jackson, TN June 2018

Non-treated Jackson, TN June 2018

---

1 Pending regulatory approvals

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Short Stature Corn Offers Transformational Shift in Production

Borrows from ‘Green Revolution’ Agronomic Science Pioneered by Dr. Norman Borlaug
Short Stature Corn Offers Transformational Shift in Production
Benefits Include Plant Stability, Late Season Applications of Crop Inputs and Efficient Use of Key Nutrients

**Reduced Crop Loss**
- Enabled by improved plant stability and lodging tolerance
- Reduces crop loss from challenging environmental conditions
- Annual yield losses due to stalk lodging in the U.S. range from 5% to 25% \(^1\)

**Precision of Crop Input Applications**
- Extended in-season crop access due to shorter height
- Supports tailored solutions with precise in-season crop protection

**Increased Environmental Sustainability**
- Potential to optimize use of key nutrients like nitrogen, as well as reducing land and water requirements

---

\(^1\) Purdue University (https://www.extension.purdue.edu/extmedia/ay/ay-262.html)

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---

**Acre Fit**

**Potential fit across**

**140 Million Corn Acres**

in the Americas

---

**Multiple Generations in the Pipeline**

- Lead project through conventional breeding, in **Phase 2**
- Biotechnology approach in collaboration with BASF, also in development, in **Phase 2**
Enhancing Processes to Identify and Optimize Small Molecule Candidates

New Safety Testing and New Screening Approaches, Combined with New Data Tools, Collectively Contribute

Additions to conventional testing cascades

1. Find New Starting Points
   - Target-Based Screening
     Direct focus on promising new modes-of-action
   - Phenotyping
     Find new starting points missed with conventional screening

Biological Screening
   Conventional approach

Increase Probability of Success

- High-throughput safety testing
  Select against chemistries with high failure risk early in the process
- Project specific safety testing
  Drive chemical optimization towards registrable compounds

Objective

1. Diverse development candidates
   with higher probability of regulatory success targeting new modes-of-action

Progress in Herbicide Discovery

2015-2018

New herbicidal chemistries in discovery process

Status 2015
- Identified
- Stopped
- Promoted

Status 2018
- Theoretical new MoA

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Biologics: Industry Leading Position

Broad Footprint, Unique Capabilities in Microbial Discovery, Characterization & Stabilization

**Leadership Position Drivers**
- Collection of >125,000 microbial strains to leverage genetic diversity to enable product development
- Integrated technology platforms achieve differentiated performance, while driving societal and grower acceptance
- Focus on classical microbial products and exploring gene-editing technologies

**Selected Strategic Partnerships**
- Gene-editing technologies
  - Synthetic biology for e.g. nitrogen-fixation
  - Delivery of biologically active proteins
  - BioAg Alliance

**Project Spotlights**

**Candidate for leaf diseases in fruits and vegetables**
- Identified from Bayer strain collection
- Optimized with tools comparable to breeding technologies and high-throughput screening for consistent field efficacy and favorable application characteristics

**Crop efficiency candidate for current and new soybean targets**
- Benefits include yield optimization, enhanced crop establishment (below) and root system efficiency

**Crop Efficiency product Acceleron BioRise 2 for corn**
- Increases phosphate availability and stimulates mycorrhizal spores, which can improve water and nutrient uptake
- Part of BioAg collaboration with Novozymes

Untreated Control  | Treated with Candidate
Untreated Control  | Treated with Candidate
Untreated Control  | BioRise 2 treated
Combined Scientific Expertise Unlocks New Potential

Accelerates Rate of Innovation and Allocates R&D Investment More Efficiently

// Our combined expertise in crop sciences will allow us to:
   // Design complete solutions that combine traits with chemistry for control of persistent insect pests
   // Focus research investment where control challenges currently exists to drive the development of new product offerings
   // Minimize redundant R&D investment to unlock new solutions that provide greater grower value now and in the future

// EXAMPLE: Throughout the season, many different insects damage soybeans in South America
   // Each bar represents an insect and how it is controlled today, as well as the opportunity for the future
# Key Takeaways

Shaping Agriculture to Benefit Farmers, Consumers and our Planet

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Leading R&amp;D platforms and pipeline frontrunner in scale and value</td>
</tr>
<tr>
<td>2</td>
<td>R&amp;D supplemented with open innovation model</td>
</tr>
<tr>
<td>3</td>
<td>Optimizing large and diverse germplasm library with advanced breeding technologies</td>
</tr>
<tr>
<td>4</td>
<td>Leader in next-generation biotech traits; technology provider to the industry</td>
</tr>
<tr>
<td>5</td>
<td>Advancing new approaches in new molecule discovery and biologicals</td>
</tr>
<tr>
<td>6</td>
<td>Unlocking new potential by combining R&amp;D platforms</td>
</tr>
</tbody>
</table>
World Class
Innovation Platform

Capital Markets Day
London, December 5, 2018

Bob Reiter
Head of Research & Development
Crop Science Division
Appendix

R&D Pipeline
## Corn R&D Pipeline – Peak Sales Potential: €11-14bn

<table>
<thead>
<tr>
<th>YIELD &amp; ABIOTIC STRESS</th>
<th>Technology</th>
<th>Phase</th>
<th>Enhancement**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual germplasm upgrades</td>
<td>✓</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Short Stature Corn</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Short Stature Corn ¹</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

**PEST MANAGEMENT**

<table>
<thead>
<tr>
<th>Above Ground (Lepidoptera)</th>
<th>Technology</th>
<th>Phase</th>
<th>Enhancement**</th>
</tr>
</thead>
<tbody>
<tr>
<td>4th generation Lepidoptera protection</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>5th generation Lepidoptera protection</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Tetraniliprole</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Belt Smart</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Below Ground (Coleoptera)</th>
<th>Technology</th>
<th>Phase</th>
<th>Enhancement**</th>
</tr>
</thead>
<tbody>
<tr>
<td>SmartStax Pro</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>4th generation Coleoptera protection</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

**Sucking Pests**

<table>
<thead>
<tr>
<th>Stinkbug pipeline</th>
<th>Technology</th>
<th>Phase</th>
<th>Enhancement**</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARVIS</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
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</table>

**Nematodes**

<table>
<thead>
<tr>
<th>Nemastrike 2</th>
<th>Technology</th>
<th>Phase</th>
<th>Enhancement**</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

**New Insecticide**

²**Product enhancement: (Life Cycle Management activities)**

- Breeding – incl. native traits and molecular breeding
- Plant Biotech – biotechnology traits and targeted genome optimization
- Crop Protection – chemical and biological solutions applied as seed treatment, foliar or via soil

²**Status indication for Life Cycle Management Items**

- Strategic collaborations
- Represents annual advancements and upgrades
- Pipeline status highlighting significant development, progress or advancement in R&D Pipeline (pink) and Key Life Cycle Management (blue) work.
### Soybean R&D Pipeline – Peak Sales Potential: €6-7bn

<table>
<thead>
<tr>
<th>R&amp;D Target</th>
<th>Technology</th>
<th>Phase*</th>
<th>Enhancement**</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>YIELD &amp; ABIOTIC STRESS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual germplasm upgrades</td>
<td>✓</td>
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<td></td>
</tr>
<tr>
<td>High Yielding Soy¹</td>
<td>✓</td>
<td></td>
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<tr>
<td><strong>PEST MANAGEMENT</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>INTACTA RR2 pro</td>
<td>✓</td>
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<td></td>
</tr>
<tr>
<td>Belt Smart</td>
<td>✓</td>
<td>NEW</td>
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<tr>
<td>Sucking Pests</td>
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</tr>
<tr>
<td>Aphid &amp; Whitefly pipeline</td>
<td>✓</td>
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<tr>
<td>Stinkbug Pipeline</td>
<td>✓</td>
<td></td>
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<tr>
<td>Novel Mite Solution</td>
<td>✓</td>
<td>NEW</td>
<td></td>
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<tr>
<td><strong>Nematode</strong></td>
<td></td>
<td></td>
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<tr>
<td>Plant health systems</td>
<td>✓</td>
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<td></td>
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<tr>
<td>Nemasafe 2</td>
<td>✓</td>
<td>NEW</td>
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</tbody>
</table>

¹ In collaboration with BASF

**R&D Phases:**
1 – Research, 2 – Early Development, 3 – Late Development, 4 – Registrations Filed

**Product enhancement:** (Life Cycle Management activities)
Dev. – Under development, Subm. – Submitted for Registration

---

### DISEASE MANAGEMENT
- Soy Disease Shield
- Asian Soybean Rust
- Leaf Spot Diseases
- New Fungicide
- Early Pipeline

### WEED MANAGEMENT
- Herbicide tolerance
- New Soybean selective herbicide
- ImprovedDicamba & Glyphosate Premix
- ImprovedDicamba formulations
- Next Generation Roundup
- Warrant® + Dicamba Premix
- Podium Supra
- Early Pipeline
- Novel PPO Herbicide
- New Herbicide

---

* Br. Breeding – incl. native traits and molecular breeding
* PBt. Plant Biotech – biotechnology traits and targeted genome optimization
* CP. Crop Protection – chemical and biological solutions applied as seed treatment, foliar or via soil

### Pipeline Status Highlighting Significant Development, Progress or Advancement in R&D Pipeline (pink) and Key Life Cycle Management (blue) Work.
**Cereals, Oilseed Rape, Cotton, Rice R&D Pipelines – Peak Sales Potential: €4-5bn**

<table>
<thead>
<tr>
<th>R&amp;D Target</th>
<th>Technology</th>
<th>Phase*</th>
<th>Enhancement**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereals</td>
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</tbody>
</table>

**YIELD & ABIOTIC STRESS**

- Annual germplasm upgrades

**PEST MANAGEMENT**

- New Cereals Selective Herbicide

**DISEASE MANAGEMENT**

- New Fungicide Seed Treatment

---

**Oilseed Rape**

<table>
<thead>
<tr>
<th>R&amp;D Target</th>
<th>Technology</th>
<th>Phase*</th>
<th>Enhancement**</th>
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<tbody>
<tr>
<td>Oilseed</td>
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</table>

**YIELD & ABIOTIC STRESS**

- Annual germplasm upgrades

**PEST MANAGEMENT**

- New Bixafen extensions

**DISEASE MANAGEMENT**

- New Fungicide Seed Treatment

---

**Cotton**

<table>
<thead>
<tr>
<th>R&amp;D Target</th>
<th>Technology</th>
<th>Phase*</th>
<th>Enhancement**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotton</td>
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</tbody>
</table>

**YIELD & ABIOTIC STRESS**

- Annual germplasm upgrades

**PEST MANAGEMENT**

- Novel PPO Herbicide

**DISEASE MANAGEMENT**

- New Insecticide

---

**Rice**

<table>
<thead>
<tr>
<th>R&amp;D Target</th>
<th>Technology</th>
<th>Phase*</th>
<th>Enhancement**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
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</tbody>
</table>

**YIELD & ABIOTIC STRESS**

- Annual germplasm upgrades

**PEST MANAGEMENT**

- New Insecticide

---

// Bayer Capital Markets Day // London, December 5, 2018
### Horticulture R&D Pipeline – Peak Sales Potential: €3-4bn

<table>
<thead>
<tr>
<th>R&amp;D Target</th>
<th>Technology</th>
<th>Phase*</th>
<th>Enhancement**</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Breeding</strong></td>
<td>incl. native traits and molecular breeding</td>
<td>1 – Research, 2 – Early Development, 3 – Late Development, 4 – Registrations Filed</td>
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</tr>
<tr>
<td><strong>Plant Biotech</strong></td>
<td>biotechnology traits and targeted genome optimization</td>
<td></td>
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</tr>
<tr>
<td><strong>Crop Protection</strong></td>
<td>chemical and biological solutions applied as seed treatment, foliar or via soil</td>
<td></td>
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</tr>
</tbody>
</table>

#### Genetic Pipeline Upgrades
- >146 advancements to launch
- Torelino tomato
- Pfiefer bell pepper
- Whitem cauliflower

#### PEST MANAGEMENT
- *Chewing Pests*
  - Tetraniplote
- *Sucking Pests*
  - *Aphid & Whitefly pipeline*
    - Novel Sucking Pest Solution
    - SIVANTO brand family extension
  - Novel Mite Solution
- *Nematodes*
  - Nemastrike
  - Velum
    - Next gen nematode resistant tomato
- *Early Pipeline*
  - *New Insecticide*

#### DISEASE MANAGEMENT
- Plant Health Systems
- Geminivirus resistant tomato
- Downy Mildew resistant lettuce
- Dicot Leaf & Fruit Diseases
  - New Fungicide
  - Isoflucypram
  - LUNA brand family extension
  - Serenade ASO
  - Oomycetes
  - Flucosaprin
  - Seed & Soilborne Diseases
  - Isoflucypram
  - High concentrated biological
  - Bacteria
    - Isotrainil
  - Serenade ASO
  - Early Pipeline
    - New Fungicide
  - WEED MANAGEMENT
    - Early Pipeline
    - New Herbicide

#### Pipeline Status Highlighting Significant Development, Progress or Advancement in R&D Pipeline (pink) and Key Life Cycle Management (blue) Work.
### Biologicals R&D Pipeline

#### Legacy Monsanto Biologicals Projects

<table>
<thead>
<tr>
<th>R&amp;D Target</th>
<th>Crop</th>
<th>Phase*</th>
<th>Enhancement**</th>
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</thead>
<tbody>
<tr>
<td>BioAg Alliance¹</td>
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<tr>
<td>BioYield 2 for S America</td>
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<tr>
<td>BioYield 2 (Accleron 360)</td>
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<td>BioYield 3</td>
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<tr>
<td>BioYield 3</td>
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<td><strong>PEST MANAGEMENT</strong></td>
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<td>Nematodes</td>
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<tr>
<td>BioNematicide (Actinovate)</td>
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<tr>
<td><strong>BioDirect²</strong></td>
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<tr>
<td>Bee Health – Varroa Control</td>
<td>1</td>
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</tbody>
</table>

¹ BioAg Alliance – Monsanto legacy microbials, partnership with Novozymes
² BioDirect – topical RNAi

#### Legacy Bayer Biologicals Projects

<table>
<thead>
<tr>
<th>R&amp;D Target</th>
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<th>Enhancement**</th>
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</thead>
<tbody>
<tr>
<td><strong>YIELD &amp; ABIOTIC STRESS</strong></td>
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<tr>
<td>Yield &amp; Quality</td>
<td></td>
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<tr>
<td>High concentrated Biological</td>
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<tr>
<td><strong>DISEASE MANAGEMENT</strong></td>
<td></td>
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<tr>
<td>Dicot Leaf Spots</td>
<td>1</td>
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<tr>
<td>Serenade ASO</td>
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<tr>
<td>Seed &amp; Soil-borne Diseases</td>
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<tr>
<td>High concentrated Biological</td>
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<td>Bacteria</td>
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<tr>
<td>Serenade ASO</td>
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<tr>
<td>Early Pipeline</td>
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<tr>
<td>New Fungicide</td>
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*R&D Phases:
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**Product enhancement:** (Life Cycle Management activities)
Dev. – Under development, Subm. – Submitted for Registration
Advancing the Digital Transformation

Capital Markets Day
London, December 5, 2018

Mike Stern
Head of The Climate Corporation and Digital Farming
Disclaimer

Cautionary Statements Regarding Forward-Looking Information

This presentation contains forward-looking statements. A forward-looking statement is any statement that does not relate to historical facts and events, but rather reflects Bayer’s current beliefs, expectations and assumptions regarding the future. This applies, in particular, to statements in this presentation on revenue growth, including product introductions and peak sales potential, synergies, especially in relation to the acquisition and integration of Monsanto Company, portfolio adjustments, cost reduction, financial targets and earnings, cash flow generation, deleveraging and other similar statements relating to future performance, including with respect to the markets in which Bayer is active.

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For more information on factors that could cause actual results and future events to differ from those anticipated in forward looking statements, please refer to the factors discussed in Bayer’s public reports which are available on the Bayer website at https://www.investor.bayer.com/en/reports/annual-reports/overview/, including in the Annual Report 2017 under the caption “Report on Future Perspectives and on Opportunities and Risks”.
The Digital Farming Opportunity
Providing Farmers with Timely Insights to Make More Informed Decisions and Increase Yield

Yield = \( f(g,e,p) \)

Yield is a function of genetics, environment and farming practices

FieldView yield map of a field in Illinois in the United States

+75 bu/ac yield difference between red and green areas

Opportunity from optimized yield equation

2017 NCGA Corn Yield Contest Winner

542 bu/ac vs. 175 bu/ac national average\(^1\)

2017 Soy Yield Contest Winner

138 bu/ac vs. 49 bu/ac national average\(^1\)

\(^1\) USDA crop production summary report

\// Bayer Capital Markets Day // London, December 5, 2018
FieldView Platform Leads the Digital Transformation in Agriculture

Provides Multiple Ways to Create Value for Farmers, the Industry and the Enterprise

Today: Agronomic services

- Applications that visualize, analyze and recommend
- Driven by data

$1,000 subscription + $300 hardware

- Data Visualization and Storage
- Yield Analysis
- Manual Fertility Scripting
- Manual Seed Scripting
- Field Health Imagery

Per-Acre Offerings

Advanced Seed Scripting  Seed Placement Advisor

Today: FieldView platform

50+ partners leverage FieldView platform to bring their digital Ag innovations to farmers, and pay for access to platform

Tomorrow: Enterprise benefit

Driving value across our internal operations and businesses by reducing production costs and enabling outcome-based pricing models to drive incremental sales

- Commercial sales
- Technology
- Supply chain
- Business analytics

1 All trademarks are the property of their respective owners

// Bayer Capital Markets Day // London, December 5, 2018
FieldView: The Leading Brand and Platform for Growers

Our Value Creation is Supported by our Performance Trends; Paid Acres >7x Closest Competitor

Global Paid Acres¹

#1 platform in the digital Ag space

<table>
<thead>
<tr>
<th>FY15</th>
<th>FY16</th>
<th>FY17</th>
<th>FY18e</th>
<th>FY19 Target</th>
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<tbody>
<tr>
<td>5m</td>
<td>15m</td>
<td>&gt;35m</td>
<td>60m</td>
<td>90m</td>
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Brand Health² (U.S.)

#1 brand in the digital Ag space

<table>
<thead>
<tr>
<th>Awareness</th>
<th>Familiarity</th>
<th>Consideration</th>
<th>Have Used</th>
<th>Currently Use</th>
</tr>
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<tbody>
<tr>
<td>77%</td>
<td>65%</td>
<td>44%</td>
<td>37%</td>
<td>33%</td>
</tr>
</tbody>
</table>

On >3m in Brazil, >2m acres in Canada and launched in Germany, France & Ukraine in 2018

¹ Internal estimates
² 2018 Brand Health Monitor

// Bayer Capital Markets Day // London, December 5, 2018
Extensive and Unique Data Collection Capability

FieldView Drive Device Collects, Connects and Digitizes Farmer Activity Informing and Improving our Models and the Digital Tools Farmers are Deploying in their Fields

Hybrid Brand Performance Data in FieldView

- Bayer: 42%
- Other (incl. Bayer licensees): 37%
- Corteva: 3%
- Syngenta: 18%

Connected Combines — Seamless Data Aggregation

~10,000 connected combines uploading data on 10-18-2018
Vast, Diverse Data and Technical Infrastructure Drive Machine Learning Capabilities and Competitive Advantage

Smarter Digital Tools Enable Significantly Improved Decision-Making and Productivity for Growers

**Data Sources**
- Bayer Research Trials
- Climate Research Farms
- Climate Research Partners
- FieldView Data
- Environmental Data
- Platform Partner Data

**Proprietary Data Science Warehouse**
- Ingest
- Clean
- Standardize
- Grid
- Integrate

**Machine Learning Algorithm Development**
- Developed seed placement models
- Validated seed placement models

Our data science warehouse and machine learning platform dramatically improves predictive models
Building a Global, Integrated Platform for Farmers and Our Enterprise

Benefits to Farmers from FieldView Create a Virtuous Circle of Value Creation from Richer Data Sets, Leading to Smarter Digital Tools that Inform Farmer and Enterprise Decision-Making

Gather and organize data
Visualize and tabulate
Compare and benchmark
Diagnose, recommend and prescribe
Drives customer satisfaction and loyalty, attracting more data
FieldView Platform Creates Value for Our Seed Business

FieldView Use Correlates to Share of Farm Growth and Customer Retention Gains by Allowing Growers to Easily See Product Performance on Their Farms

**Increased share-of-farm**

1. For **Corn Farmers in 2016 & 2017** (n=4,072)
   - Share of Farm: +5.2%

2. For **Soybean Farmers in 2016 & 2017** (n=3,519)
   - Share of Farm: +4.8%

**Higher customer retention**

1. For **Bayer Corn Seed Brands**
   - +5.5%

2. For **Bayer Soybean Seed Brands**
   - +3.1%

---

1. Data set consists of farmers with planting and yield data in FieldView in 2016 and 2017.
2. Share of Farm: Percentage of Bayer corn/soybean seed brand on total acres of farm, based upon FieldView data ingest.
3. Farmers using FieldView Yield Analysis vs. those not using Yield Analysis.
The Critical Seed Purchase and Placement Decision
Launching FieldView Seed Placement Advisor to Help Farmers Place the Right Seeds in the Right Fields

**Products**
*Which* products should I purchase?

**Portfolio**
*How* much of each product should I purchase?

**Assignment**
*Which* fields do I optimally place each hybrid?

**Density**
*What* density do I use for the hybrid in this field?
Introducing Seed Placement Advisor for Corn

Using Multiple Algorithms and FieldView Data to Support Seed Selection and Field Placement has Significantly Improved Productivity in Field Tests

Algorithm Development

- 5 years of Bayer R&D Data
- 6m Data Points
- +53K Fields, ~7,600 Hybrids
- Validated Using 4.4m Acres of FieldView Customer Data

Algorithm selection of corn hybrids predicted win rate of 80% and 3-4 bu/ac advantage

Field Tests

- 2018 Results
  - 89% win rate
  - +10 bu/ac

- 2017 Results
  - 77% win rate
  - +6 bu/ac

- 2018 Results
  - 89% win rate
  - +10 bu/ac

2019 Beta (Launch)

- $4/acre per season
- 50 dealers, 3 states
- 200 farmers

Additional data points increase algorithm efficacy and predicted win rate of >90%

Developing algorithm for soy: beta testing in 2020

2016
2017
2018
2019

(30 trials to date)

1 Internal estimates and field trials

/// Bayer Capital Markets Day /// London, December 5, 2018
In-Season Disease Risk Prediction to Identify Susceptible Fields
Planning 2019 Pilot for a Solution for Faster Scouting and More Timely Deployment of Crop Protection

<table>
<thead>
<tr>
<th>Risk-ranking dashboard</th>
<th>Field-level risk report</th>
<th>Disease identification tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>// In-season predictions of disease impact for each field</td>
<td>// Faster, simplified scouting with automatic disease identification</td>
<td></td>
</tr>
<tr>
<td>// Identify fields with highest likelihood of positive return on investment for fungicide application</td>
<td>// Automatic plant health issue tracking</td>
<td></td>
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<tr>
<td>// Incorporate history into next season management and product selection</td>
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</tr>
</tbody>
</table>
Outcome-Based Pricing Expected to Drive Increased Purchases
Potential to Expand Fungicide Use in Corn and Create Value for Growers

**Outcome-Based Pricing Research²**

Three-quarters of farmers are more likely to purchase a product with outcome-based pricing.

- **74%**
  - Much more to somewhat likely to purchase (1-5)
  - No impact (0)
  - Much less likely to purchase (-4 - -5)

Half of farmers say they would be likely to SWITCH brands with outcome-based pricing.

- **50%**
  - Somewhat to very likely to switch brand (7-10)
  - Might/Might Not (4-6)
  - Not at all likely to switch brands (0-3)

**DEKALB Corn Hybrid Response to Fungicide¹**

2016 study reveals that fungicide treatments used with DEKALB hybrids offer average yield protection of >8 bu/ac; however, only utilized on about 15-20%³ of U.S.A. corn acres today

---

¹ Internal R&D trials
² 2017 and 2018 Market Probe Research commissioned for internal study
³ USDA NASS 2016/2017 report, figure 2 and internal estimates

// Bayer Capital Markets Day // London, December 5, 2018
FieldView Enables Outcome-Based Pricing Model for Fungicides

Farmers Share Value with Bayer for Yield Achieved Above Threshold, as Measured by FieldView

FieldView Maps of 2018 Fungicide Trial

Fungicide Pilot Offer

Offered outcome-based price at a defined bu/ac threshold using FieldView as tool to assess in field performance

If yield gain is not achieved, a rebate paid to grower for fungicide and application cost

Blue box on yield map on the right depicts lower yields on portion of field not treated with a fungicide, as depicted in spray map on the left
Next Opportunity: Advance Ag Landscape with Tailored Solutions
Enabled by FieldView Platform and our Leading Seed and Crop Protection Portfolio

Seed Advisor

- Seed Advisor picks the best hybrid for your field and provides a customized variable rate seeding prescription

Disease Prediction

- Disease monitoring and prediction algorithms identify fields susceptible to fungal disease by taking a simple photo of a leaf

Fungicide Pilot

- An outcome-based pricing model is offered to the grower to protect his field and drive branded fungicide sales
Significant Opportunity to Expand Digital Ag Footprint
Growth Fueled by Leading Infrastructure, Data, Distribution and Partnerships

Most established, scalable digital farming infrastructure
Largest database of grower and field trial seed performance data in the industry
Established global distribution footprint
Strategy to drive innovation through FieldView platform from partners around the world

#1 platform in the digital Ag space

~1bn Global Acre Opportunity for Corn, Soybean, Wheat¹

2019 Forecast

¹ Harvested acres – USDA FAS 2018-10-11, ex China

Bayer Capital Markets Day // London, December 5, 2018
## Key Takeaways

**Shaping Agriculture to Benefit Farmers, Consumers and our Planet**

1. Significant opportunity to minimize variability and optimize yields with digital tools
2. FieldView platform is leading digital ag platform and U.S. brand in the industry
3. Widening the gap with our leading proprietary data, warehouses and algorithms
4. Experiencing increased seed customer retention and share of farm with FieldView
5. Significantly higher win rates achieved in corn production with Seed Placement Advisor
6. Piloting first-ever outcome-based pricing models, enabled by FieldView
7. Pursuing next opportunity to advance the agricultural landscape with tailored solutions
Advancing the Digital Transformation

Capital Markets Day
London, December 5, 2018

Mike Stern
Head of The Climate Corporation and Digital Farming
Appendix

Digital Ag Pipeline
# Digital R&D Pipeline

<table>
<thead>
<tr>
<th>R&amp;D Target</th>
<th>Phase*</th>
<th>Enhancement*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FERTILITY</strong></td>
<td></td>
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<tr>
<td>Sub-Field Nitrogen Monitoring (US, Corn)</td>
<td>1</td>
<td>2</td>
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<tr>
<td>Manual Fertility Scripting (US, Corn &amp; Soy)</td>
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</tr>
<tr>
<td>P &amp; K Scripting (US Corn, Soy, Canola, Wheat, Cotton)</td>
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<td>2</td>
</tr>
<tr>
<td>P &amp; K Scripting (Brazil &amp; Argentina, Corn)</td>
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<td>2</td>
</tr>
<tr>
<td>Advanced Nitrogen Scripting (US, Corn)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Advanced Nitrogen Scripting (US, Wheat)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Advanced Nitrogen Leads (US, Corn)</td>
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<td>2</td>
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<tr>
<td><strong>SEEDS AND PLANTING</strong></td>
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<tr>
<td>Advanced Seed Prescriptions - Image Based Zones (US, Brazil, EU, Corn)</td>
<td>1</td>
<td>2</td>
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<tr>
<td>Seed Advisor – Regional (US, Corn)</td>
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<td>2</td>
</tr>
<tr>
<td>Field Specific Seed Selection (US, Corn)</td>
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<tr>
<td>Seed Advisor – Designed Hybrid Side by Side V2 (US, Corn)</td>
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<tr>
<td>Seed Advisor V2 (US, Soy)</td>
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<td>2</td>
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<tr>
<td>Enhanced Field Zones &amp; Improved Seeding (US, Corn)</td>
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<td>2</td>
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<tr>
<td>Advanced Seed Prescriptions – Pop. By Zone (Brazil, Corn)</td>
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<td>2</td>
</tr>
<tr>
<td>Advanced Seed Prescriptions – Pop. By Zone (Argentina, Corn)</td>
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<tr>
<td>Advanced Seed Prescriptions – Pop. By Zone (EU, Corn)</td>
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<tr>
<td>Advanced Seed Scripting (Soy)</td>
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<tr>
<td>Seed Advisor: Field Specific + Density (US, Corn)</td>
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</tr>
</tbody>
</table>

*R&D Phases:
1 – Proof of Concept, 2 – Development, 3 – Pre-Commercial, 4 – Commercial / Launch, 5 – Post-Commercial / Enhancement

P = Phosphorus
K = Potassium

Progress achieved Phases 1 through 4
Status indication for Enhancements to Commercial Products

Pipeline status with color highlighting significant development, progress or advancement in R&D and commercial work