Agenda

- Introduction
- Key Company Highlights
- Rail Vehicle Systems (RVS)
- Commercial Vehicle Systems (CVS)
- R&D Focus
- Financials
- Sustainability
- Capital Markets Summary
- Appendix
The Knorr-Bremse leadership team

Dr. Jan Mrosik
CEO & (interim) CVS
- 2021-present: Knorr-Bremse | CEO
- 2016-2019: Siemens AG | CEO Digital Factory Division
- 2014-2016: Siemens AG | CEO Energy Management Division
- 2011-2014: Siemens AG | CEO Smart Grid Division
- PhD in Engineering

Professional Experience: 24
Years with Knorr-Bremse: 2

Dr. Claudia Mayfeld
Member of the Board, Integrity & Legal
- 2021-present: Knorr-Bremse | Head of Integrity & Legal
- 2013-2019: RWE Pensionsfond | Member of the Executive Board
- 2016-2020: Innogy SE | Senior Vice President Group Legal & Compliance, General Counsel
- 2013-2016: RWE AG | Senior Vice President Group Legal & Compliance, General Counsel
- PhD in Accounting Principles

Professional Experience: 28
Years with Knorr-Bremse: 1

Frank Markus Weber
CFO
- 2020-present: Knorr-Bremse | CFO
- 2016-2020: Daimler AG | Head of Corporate Development
- 2019-2020: Mercedes-Benz AG | Head of Transformation
- 2013-2016: Daimler Trucks Asia | CFO
- 2011-2013 Mitsubishi Fuso Trucks & Bus Corporation | CFO
- Diploma in Bus. Administration

Professional Experience: 24
Years with Knorr-Bremse: 2

Dr. Jürgen Wilder
Member of the Board, RVS
- 2018-present: Knorr-Bremse | Head of RVS
- 2015-2017: DB Cargo AG | CEO
- 2013-2015: Siemens AG | CEO Mainline Transportation Global Business Unit
- 2011-2013: Siemens AG | Head of Strategy Infrastructure and Cities Sector
- PhD in Physics

Professional Experience: 20
Years with Knorr-Bremse: 4

Notes: RVS - Rail Vehicle Systems; CVS - Commercial Vehicle Systems
Knorr-Bremse – One of Germany’s most successful industrial companies

2021 Key financials

- **Sales**: €6.7bn (>9% CAGR\(^1\) since 1989)
- **EBITDA**: €1.2bn (margin 17.9%)
- **EBIT**: €0.9bn (margin 13.6%)
- **R&D**: €431m (~6.4% of sales)
- **Aftermarket**: ~36% of sales

**BALANCED PORTFOLIO\(^2\)**

- RVS: 49% Sales, 59% EBITDA (22% Margin)
- CVS: 51% Sales, 41% EBITDA (15% Margin)

**... AND DIVERSIFIED GLOBAL FOOTPRINT WITH HIGH LOCAL CONTENT**

- **Europe/Africa**: 46% Sales
- **Americas**: 23% Sales
- **Asia/Australia**: 31% Sales

Notes: Sales, EBITDA, EBIT, and EBIT for 2020 based on annual report prepared in accordance with IFRS; other financial figures for 2020 prepared in accordance with German GAAP (HGB); Aftermarket share based on German GAAP (HGB) where BIIRUG sales allocated proportionally between OE and aftermarket; RVS – Rail Vehicle Systems; CVS – Commercial Vehicle Systems; 1) CAGR 1989–2019 based on German GAAP (HGB), 1989 – first year when consolidated accounts are available; 2) Excluding consolidation/other; 3) Including human resources leased staff. Source: Knorr-Bremse information

Family-Ownership, heritage and unique DNA

Global market leader for braking systems

Shared pneumatics experience between RVS and CVS

Technology leadership

115 YEARS

KNORR-BREMSE

KNORR-BREMSE

KNORR-BREMSE

KNORR-BREMSE

KNORR-BREMSE

KNORR-BREMSE
Over 30 years of consistent strong growth

1985
Management buyout by Mr. Thiele

1985-1990
Successful strategy: Globalisation, focus on RVS and CVS, growth in connected systems

1991
Dawn of the ICE era with high-speed braking systems

1995-1996
Rise of ADB technology

1999
Joint Venture with Bosch in Electronics

2000
Bendix integrates Westinghouse Air Brake company

2002
100% acquisition of Bendix in the US

2006
4 Joint Ventures in Rail formed in China

2015/18
Joint Venture with DongFeng Motor goes into operation & expansion 2018

2015/16
7 acquisitions

2016
New state-of-the-art innovation and testing centre in Munich

2017/18
Acquisition of Vossloh Kiepe, Federal Mogul Ind. Property Rights and Hitachi Automotive Systems

2010-2018
€1bn+ capex invested to future-proof manufacturing and production facilities

2019
Strategic investment in RailVision & RailNova as well as acquisition of Snyder & Sentient,

2020
Acquisition of RH. Sheppard Co., Inc. in the U.S

2021
Investment in Autobrains

2021
Acquisition of EVAC

>9% sales CAGR
19851)-2021

Notes: 1986-2016 based on financial statements prepared in accordance with German GAAP (HGB) and 2017-2019 based on financial statements prepared in accordance with IFRS. 1) 1989 – first year when consolidated accounts are available
Corporate values

Entrepreneurship
- Knorr-Bremse regards challenges as opportunities for generating long-term, profitable growth

Passion
- We are passionate about what we do

Reliability
- Safety is the basis for everything we do – and we do not compromise on this

Responsibility
- As a globally operating company Knorr-Bremse incorporates a workforce with a wide range of cultures and strengths

Technological Excellence
- Knorr-Bremse stands for technological expertise and competence in all company divisions
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Global market leader in rail and truck

Market leadership

A global market leader
~50% market share in RVS brakes
~23% market share in CVS brakes

Market outperformance

Track record of above industry growth: 10% historic revenue CAGR

Innovation edge

Shaping industry trends by focusing on safety and mission critical applications

High safety requirements

Key supplier with global core technology know-how and capabilities
Clearly ahead in global homologation processes

Sustainability is part of our DNA

Our technologies are the foundation for sustainable and safe transportation

Resilience

36% aftermarket share
Well-balanced portfolio
Cost-efficient operations

Profitability

Ø EBIT margin of ~14%
Focus on attractive rail and truck end markets

1) In 2020  2) 1989-2019
Global #1 – Leading supplier of safety-critical rail and commercial vehicle systems

RVS offering (2021: 49% of sales, 59% of EBITDA)

<table>
<thead>
<tr>
<th>Brake systems</th>
<th>Entrance systems</th>
<th>HVAC(^1)</th>
<th>Train Control Management Systems</th>
<th>LRV(^2) traction systems</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Power electrics</th>
<th>Auxiliary power supply</th>
<th>Signaling systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modernisation and support</td>
<td>Modernisation and support</td>
<td></td>
</tr>
</tbody>
</table>

CVS offering (2021: 51% of sales, 41% of EBITDA)

<table>
<thead>
<tr>
<th>Fuel efficiency</th>
<th>Brake systems, steering &amp; vehicle dynamics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine components</td>
<td>Brake control</td>
</tr>
<tr>
<td>Transmission</td>
<td>Automated driving</td>
</tr>
<tr>
<td>Brake systems</td>
<td>Steering systems</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Energy supply &amp; distribution</th>
<th>Connectivity</th>
<th>Electrification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aftermarket services including Alltrucks network(^3)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Our customers

Example car builders

Example operators

Notes: 2020 financials based on IFRS excluding consolidation/other; 1) HVAC – Heating, ventilation and air conditioning; 2) LRV – Light rail vehicle; 3) Joint Venture between Bosch, Knorr-Bremse and ZF providing a range of workshop services relating to the repair and maintenance of commercial vehicles across all brands; 4) OEM – Original Equipment Manufacturer
Global #1 – … protected by high barriers to entry

Barriers to entry for RVS and CVS markets

**Regulation / homologation**

**Low volumes, high number of variants with high level of customisation**

**High initial capital requirements, highly protected IP landscape and economies of scale**

**Highest quality and safety requirements**

**Long life-cycle with resulting customer loyalty, long gestation period for aftermarket**

**Same industry leaders since creation of the industry over 100 years ago**

**Market specifics**

**RVS**

- **Only supplier world-wide** certified for all global and local standards and norms (GOST, UIC, AAR, ARA)

- **Vast array of product variants to homologate** (e.g. >100k active brake articles by Knorr-Bremse)

- **Homologation time typically 4-8 years** for recent Knorr-Bremse products

**CVS**

- **One of only two suppliers** able to offer harmonised products globally

- **Continuously increasing** safety and emission standards requirements

Same industry leaders since creation of the industry over 100 years ago
KB has maintained and expanded its market leading positions

**Market positions key product groups**

1. **Brake systems**
2. **Entrance systems**
3. **HVAC systems**

**Global brakes market shares**

- **Example global market leader for brakes**
  - Brake systems: ~50%
  - Entrance systems: ~15%

- **Global brakes market shares**
  - Brake systems & vehicle dynamics: ~3.3x
  - Energy supply & distribution: ~1.5x
  - Fuel efficiency: ~23%

---

1) 2020 estimates for OE and after-sales without labor; Wabtec includes Faiveley; For competitor, an estimate was used; Market shares rounded to the nearest multiple of 5%
2) Heating Ventilation Air Conditioning
3) For 2020 global addressable Truck, Bus and Trailer OE market, excl. aftermarket
4) Air disc brake, valves / pedal unit, actuators, foundation drum brake, steering, brake control (ABS, EBS, ESP), ADAS, ELC, others
5) Compressors, air treatment
6) Vibration dampers, engine air control, transmission – gear and clutch actuation/ control; Source: internal market research
### Resilience – Strong business model

#### Strong resilience of growth and profitability

<table>
<thead>
<tr>
<th>Different economic cycles</th>
<th>High aftermarket share</th>
</tr>
</thead>
<tbody>
<tr>
<td>~50/50 split RVS and CVS (by sales)</td>
<td>~36% total sales(^1)</td>
</tr>
<tr>
<td><strong>Different</strong> market drivers</td>
<td>– 46% of RVS sales(^1)</td>
</tr>
<tr>
<td>– short vs. long cycle</td>
<td>– 27% of CVS sales(^1)</td>
</tr>
<tr>
<td>– private vs. public investment</td>
<td><strong>Large installed base</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diversified customer base</th>
<th>Global footprint and local content</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Partner to all</strong> major local and <strong>global players</strong></td>
<td><strong>High level of local content</strong> in manufacturing, purchasing and R&amp;D</td>
</tr>
<tr>
<td></td>
<td>Presence in <strong>30+</strong> countries with <strong>100+</strong> sites</td>
</tr>
<tr>
<td></td>
<td><strong>~80%</strong> of employees <strong>outside Germany</strong></td>
</tr>
<tr>
<td></td>
<td><strong>~15%</strong> of employees in <strong>China</strong>, catering to local market</td>
</tr>
</tbody>
</table>

Notes: 1) Based on IFRS in 2020
Resilience – Attractive aftermarket business with comprehensive service offering drives profitability and contains high future potential

Aftermarket is the growth and resilience backbone

Key features

- **Annuity-like**
  - Regulated maintenance intervals
  - Leverages high installed base
  - 20-30 years long relationships

- **Close to the customer**
  - RVS
    - 36 service centres
    - 20 service locations at customers’ premises
  - CVS
    - >1,600 certified service partners
    - >700 Alltrucks workshops

- **Strong customer retention (homologation)**
  - High switching costs
  - Focus on safety and quality
  - IP protection

- **Innovative business model**
  - New connectivity-based business models
  - Preventive
  - Predictive

Aftermarket sales 2021 (€bn)

- Spares: 1.5
- Interchangeable parts: 0.9

Share of aftermarket 2020 (%)

- OE: 36%
- AM: 46%
- Services: 27%
- Modernisation: 27%
- Interchangeable parts: 46%
- Non-interchangeable parts: 0.9
- Wear parts & service kits: 27%

Notes: 1) Total CVS aftermarket sales and independent aftermarket sales EMEA (excl. South Africa & Skach) as proxy for the global split; 2) Does not include service locations at customers’ premises;
Synergistic business – Technology and scale benefits between Rail and Commercial Vehicles

Interdependence of RVS and CVS
- Same core technologies
- Shared components and materials
- Co-located R&D centers
- Shared overhead functions

Future technology development
- Shared research centres
- ADAS\(^1\) / HAD\(^2\) technology transfer
- Condition monitoring, condition-based and predictive maintenance
- Electrification and connectivity
- Electromechanical brake systems

Differences of RVS and CVS
- Serial business (CVS) vs. project business (RVS)
- Different customer group

RVS
- Electric compressors
- Friction materials
- Air disc brakes (ADB)

CVS
- Driver assistance
- Trailer control valve
- Electronic air supply

Notes: 1) ADAS – Advanced driver assistance system; 2) HAD – Highly automated driving
Innovation is the basis of KB’s technology leadership and long-term success

**True Scale:**
- ~3,800 R&D employees
- Thereof 740 software engineers
- 5 global R&D centers (3 co-located)

**Agile R&D methods** implemented

**Extensive partnership** network & collaboration with tech players

**In-house incubator** eCUBATOR

**Pioneering innovations (examples)**

<table>
<thead>
<tr>
<th>RVS</th>
<th>CVS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital automatic coupler for freight (DAC)</td>
<td>Electric power steering</td>
</tr>
<tr>
<td>Reproducible braking distance</td>
<td>Electronic parking brake</td>
</tr>
<tr>
<td>LIFEDrive sliding doors</td>
<td>eCompressor</td>
</tr>
</tbody>
</table>

**Long-term R&D ratio:** 6 – 7 %
We confirm our successful strategy

1. Systematically **develop base portfolio**
2. **Focus on attractive segments** for future outperformance in **rail** and **truck**
3. Drive **innovation & digitalization**
4. **Clear M&A strategy**
5. **Operational excellence**
6. **ESG and sustainability**
7. **Strong financial performance**
KB will continue to grow its core business further and will also develop new levers of growth.

Leverage strong position

Established and strong foundation
- Leading market position
- Above market growth rates
- Resilient profitability
KB continues to systematically develop its portfolio of mission critical products and digital solutions.

**Mechanical products**
- Pneumatic brake system
- Air disc brake

**Mechatronic products**
- Electronically controlled pneumatic brake

**Smart & digital products**
- Smart brake control (Cube Control)
- GSBC & rGSBC
- ABS & EBS
# Build new business in RVS

## Industry trends

<table>
<thead>
<tr>
<th>Digital Services</th>
<th>Automation</th>
<th>Energy &amp; Eco Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability</td>
<td>Lifecycle Management</td>
<td>Transport Capacity</td>
</tr>
<tr>
<td>Lifecycle</td>
<td></td>
<td>Eco Friendliness</td>
</tr>
<tr>
<td>Management</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Applications (examples)

<table>
<thead>
<tr>
<th>Condition-based/predictive maintenance</th>
<th>Aftermarket</th>
<th>Automation</th>
<th>Energy savings / metering</th>
</tr>
</thead>
<tbody>
<tr>
<td>European train operator use case</td>
<td></td>
<td></td>
<td>Driver advisory system</td>
</tr>
<tr>
<td>HVAC monitoring &amp; energy saving</td>
<td></td>
<td>Automation</td>
<td>Smart metering</td>
</tr>
<tr>
<td>Investment into Railnova</td>
<td></td>
<td>RBD²</td>
<td></td>
</tr>
<tr>
<td>RailServices portfolio for optimized LCC¹</td>
<td></td>
<td>Increased train density</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Environment sensing</td>
<td></td>
</tr>
</tbody>
</table>

## RVS solutions (examples)

1) Lifecycle costs  2) Reproducible Braking Distance
Build new business in CVS

Industry trends

Digital Services
- Connectivity/ Digital Truck

Automation
- Automated Driving

Energy & Eco Efficiency
- E-Mobility/ Emission Reduction

Applications (examples)

CVS solutions (examples)
- Driver safety management
- ADAS
- HAD actuation & motion control
- Electrification

Collecting safety data and video for coaching & evaluation
ADAS offering with strong partners
Combining steering, braking, and motion control

CVS strongly positioned to innovate products for the E-Mobility age (BEV and FCEV) Only minor part of CVS portfolio affected by electrification
KB drives digitalization in two dimensions

Digital products and services

- Solution portfolio
  - From mechatronic to smart & connected products
  - New capabilities (e.g., analytics) and platforms for new products and services
  - Build digital business models

Internal digitalization

- Inhouse operations
  - Standardized end-to-end processes
  - Digitalization

Product enhancement with digital technology

- Condition Monitoring
  - Remotely monitor condition of KB products

Digital business models

- Predictive Maintenance
  - Optimize operations and maintenance process together with customers
Capital allocation priorities: clear framework with focus on organic growth and bolt-on M&A

- **High priority**
  - Organic growth
  - R&D ratio: 6% - 7%
  - CapEx ratio: 5% - 6%
  - Dividend payout ratio: 40% - 50%

- **Bolt-on M&A**
- **Share buybacks**

- **Low priority**
  - In-organic growth
M&A – clear strategy

Priorities

- Pursue attractive and selective segments in rail and truck for future outperformance
- Focus on bolt-on acquisitions in rail and truck, no focus on third pillar
- Strengthen our core business with new capabilities
- Continue active portfolio management along stringent strategic and financial criteria

Strategic Principles

<table>
<thead>
<tr>
<th>Markets &amp; Segments</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Highly attractive growth segments with strong entry barriers</td>
</tr>
<tr>
<td>- Technological differentiation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Business Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Leading market position and/or leading technology</td>
</tr>
<tr>
<td>- Sustainable competitive advantage</td>
</tr>
<tr>
<td>- Resilient business model</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Synergies</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Best owner principle</td>
</tr>
<tr>
<td>- Tangible and realistic synergies</td>
</tr>
<tr>
<td>- Easy to integrate with high cultural fit</td>
</tr>
</tbody>
</table>
M&A – clear financial guardrails

**Priorities**

- **Attractive segments**
- **Bolt-on acquisitions**
- **Strengthen core business**
- **Active portfolio management**

**Financial principles for larger transactions**

- **Value accretive** for KB
- **Strong cash generation**
- **High profitability (ROS + ROCE)**
- **High aftermarket revenue base**
- **Asset-light business model**

**Portfolio management, if needed**

- **Start-ups with clear plan for strong financial profile / accretive cooperation potential**
- **Stringent post merger integration** to ensure deliverables
Focus on operational excellence

- Global platforms
- Process digitalization and standardization
- Footprint optimization
- Continued “local for local“ set-up and value chain
- Cost improvements
FY21: Guidance achieved in a challenging environment

<table>
<thead>
<tr>
<th>Revenue</th>
<th>op. EBIT margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>€m</td>
<td></td>
</tr>
<tr>
<td>Promised</td>
<td>Delivered</td>
</tr>
<tr>
<td>6,600-6,800</td>
<td>6,706</td>
</tr>
<tr>
<td>FY21 Guidance</td>
<td>FY21 Achievement</td>
</tr>
<tr>
<td>13.0-13.5%</td>
<td>13.6%</td>
</tr>
<tr>
<td>FY21 Guidance</td>
<td>FY21 Achievement</td>
</tr>
</tbody>
</table>

- Outperformance in major markets
- Resilient profitability
- Strong cash preservation during Covid
- Corporate Governance improvements
- Shareholder value generation

Stronger growth than markets
- op. EBIT margin of 13.6%
- FCF of € 600m and CCR of 92%
- ESG target in STI included and reporting shortened
- EPS at 3.87 and ROCE 25.0%
**Group Guidance 2022 fully in line to support our mid-term targets**

<table>
<thead>
<tr>
<th>Revenue (€ m)</th>
<th>op. EBIT margin</th>
<th>Free Cashflow (€ m)</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY21</td>
<td>6,706</td>
<td>13.6%</td>
<td>▪ Stable geopolitical and economic environment</td>
</tr>
<tr>
<td>FY22e</td>
<td>6,800-7,200</td>
<td>12.5-14.0%</td>
<td>▪ FX rates stable yoy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>▪ No further setbacks occur as a result of Covid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>▪ Shortages of semiconductors and bottlenecks in the supply of other materials should continue</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>▪ FTE: 31,000-32,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>▪ ROCE: ≥25%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>600</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>500-600</td>
<td></td>
</tr>
</tbody>
</table>
Mid-term outlook: continued profitable growth of Knorr-Bremse towards 2025

Organic revenues in €bn

<table>
<thead>
<tr>
<th>Year</th>
<th>2020</th>
<th>2021</th>
<th>2022e</th>
<th>2025e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue CAGR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RVS</td>
<td>5 – 6%</td>
<td>18.0 – 19.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CVS</td>
<td>7 – 8%</td>
<td>12.0 – 13.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>≥30%</td>
<td>80 – 90%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EBIT margin (ROS)

<table>
<thead>
<tr>
<th>Year</th>
<th>2020</th>
<th>2021</th>
<th>2022e</th>
<th>2025e</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBIT margin (ROS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RVS</td>
<td>13.2%</td>
<td>13.6%</td>
<td>12.5-14.0%</td>
<td>14.0 – 16.0%</td>
</tr>
<tr>
<td>CVS</td>
<td>17.9%</td>
<td>EBITDA margin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>≥30%</td>
<td>EBITDA margin</td>
<td></td>
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</tr>
</tbody>
</table>

Note: Operating margins shown 2021 and 2025; based on market expectations mirrored in other CMD presentation parts
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RVS – Outperformance and resilience

Market leadership

- Global #1 market leader across products and regions (e.g. ~50% market share in brake systems)

Strong growth profile

- RVS with long track record of outperforming underlying markets

Technology innovation

- Strong technology innovator shaping industry standards
- Continuation of R&D investments

High barriers to entry

- Safety-critical products with significant homologation barriers
- RVS only supplier certified for all standards and norms globally

Resilience

- Expansion of business through customer-region-product mix
- Strong aftermarket (~46% revenue share)

Profitability

- Outstanding profit margins with track record of margin expansion and disciplined cost management (EBIT margin ~18%)
RVS – the leading safety critical systems supplier for rail with a track record of market outperformance

Highlights

- Rail brake systems supplier globally¹
- Rail entrance systems supplier globally¹
- HVAC systems supplier globally¹
- Global brakes market share¹
- Present in 50-55% of global installed base²
- c.16k employees

2021 key financials

- € 3.5bn sales
- 4.6% CAGR 2010-2021³
- € 730m EBITDA (22.0% margin)
- € 599m EBIT (18.1% margin)
- 46% aftermarket share⁴

2021 sales split

- by region (€ 3.5bn)
  - Europe 52%
  - Asia /Australia 38%
  - Americas 10%
- by channel
  - OE 54%
  - AM 46%

Notes:
BilRUG sales allocated proportionally between OE and aftermarket; 1) RVS market share estimates for OE and aftersales without labour; 2) All active rail vehicles without freight cars with a minimum of one Knorr-Bremse system related to brakes, entrance systems and HVAC installed; 3) Total reported RVS sales growth including OE and aftermarket based on German GAAP (HGB) 2010-2016; from 2016 IFRS 4) BilRUG sales allocated proportionally between OE and aftermarket

Fact Book 31
Deep dive into RVS braking technologies of Knorr-Bremse

Key elements of a braking system in RVS
Long-term growth in global rail will continue, despite Covid U-shape

Development of relevant sub-systems market volume¹ (OE + RS in €bn)

Non-Covid-impacted CAGR ~2%

Covid-impacted CAGR ~4%

1) Big Five - Brakes, Doors, HVAC, Power Electrics, TCMS; Source: Knorr-Bremse information and internal market research
Future growth will come from markets in Europe, Asia and North America

Market development OE
in €m, CAGR in %

Selected biggest growth markets

<table>
<thead>
<tr>
<th>Market</th>
<th>CAGR '19-'25</th>
<th>Market position</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America &amp; Mexico MT</td>
<td>~11%</td>
<td></td>
</tr>
<tr>
<td>Austria</td>
<td>~27%</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>~6%</td>
<td></td>
</tr>
<tr>
<td>Russia &amp; CIS (High Grade)</td>
<td>~4%</td>
<td></td>
</tr>
<tr>
<td>Scandinavia</td>
<td>~10%</td>
<td></td>
</tr>
<tr>
<td>Spain &amp; Portugal</td>
<td>~26%</td>
<td></td>
</tr>
<tr>
<td>India (High Grade)</td>
<td>~5%</td>
<td></td>
</tr>
<tr>
<td>South East Asia, HK, TW</td>
<td>~14%</td>
<td></td>
</tr>
<tr>
<td>Selected biggest growth markets</td>
<td>~9%</td>
<td></td>
</tr>
<tr>
<td>RoW²</td>
<td>~3%</td>
<td></td>
</tr>
</tbody>
</table>

1) Brakes, Doors, HVAC, rounded to the nearest 50
2) Rest of World w/o selected biggest growth markets & w/o China
3) High Grade only, w/o conventional market

Source: KB internal market research; Values recognize FX rates

Future growth will come from markets in Europe, Asia and North America

Market development OE
in €m, CAGR in %

Selected biggest growth markets

<table>
<thead>
<tr>
<th>Year</th>
<th>Market</th>
<th>Value</th>
<th>CAGR</th>
<th>Market position</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>North America &amp; Mexico MT</td>
<td>~1,100</td>
<td>~11%</td>
<td></td>
</tr>
<tr>
<td>2025e</td>
<td>North America &amp; Mexico MT</td>
<td>~1,800</td>
<td>~11%</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>Austria</td>
<td>~1,350</td>
<td>~27%</td>
<td></td>
</tr>
<tr>
<td>2025e</td>
<td>Austria</td>
<td>~1,300</td>
<td>~27%</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>France</td>
<td>~1,350</td>
<td>~6%</td>
<td></td>
</tr>
<tr>
<td>2025e</td>
<td>France</td>
<td>~1,300</td>
<td>~6%</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>Russia &amp; CIS (High Grade)</td>
<td>~1,350</td>
<td>~4%</td>
<td></td>
</tr>
<tr>
<td>2025e</td>
<td>Russia &amp; CIS (High Grade)</td>
<td>~1,300</td>
<td>~4%</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>Scandinavia</td>
<td>~1,350</td>
<td>~10%</td>
<td></td>
</tr>
<tr>
<td>2025e</td>
<td>Scandinavia</td>
<td>~1,300</td>
<td>~10%</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>Spain &amp; Portugal</td>
<td>~1,350</td>
<td>~26%</td>
<td></td>
</tr>
<tr>
<td>2025e</td>
<td>Spain &amp; Portugal</td>
<td>~1,300</td>
<td>~26%</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>India (High Grade)</td>
<td>~1,350</td>
<td>~5%</td>
<td></td>
</tr>
<tr>
<td>2025e</td>
<td>India (High Grade)</td>
<td>~1,300</td>
<td>~5%</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>South East Asia, HK, TW</td>
<td>~1,350</td>
<td>~14%</td>
<td></td>
</tr>
<tr>
<td>2025e</td>
<td>South East Asia, HK, TW</td>
<td>~1,300</td>
<td>~14%</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>Selected biggest growth markets</td>
<td>~1,350</td>
<td>~9%</td>
<td></td>
</tr>
<tr>
<td>2025e</td>
<td>Selected biggest growth markets</td>
<td>~1,300</td>
<td>~9%</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>RoW²</td>
<td>~1,350</td>
<td>~3%</td>
<td></td>
</tr>
<tr>
<td>2025e</td>
<td>RoW²</td>
<td>~1,300</td>
<td>~3%</td>
<td></td>
</tr>
</tbody>
</table>

1) Brakes, Doors, HVAC, rounded to the nearest 50
2) Rest of World w/o selected biggest growth markets & w/o China
3) High Grade only, w/o conventional market

Source: KB internal market research; Values recognize FX rates

Fact Book 34
The enormous brake distances in Rail require outstanding braking performance

**Different braking distances at 80km/h**

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td>1,500</td>
</tr>
<tr>
<td>Truck with trailer</td>
<td>40,000</td>
</tr>
<tr>
<td>LRV</td>
<td>60,000</td>
</tr>
<tr>
<td>MU regional &amp; commuter</td>
<td>240,000</td>
</tr>
<tr>
<td>Loco hauled freight train</td>
<td>4,000,000</td>
</tr>
</tbody>
</table>

Changing weather and environmental conditions significantly impact brake distances.

**Different braking distances at 330km/h**

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-speed train</td>
<td></td>
</tr>
</tbody>
</table>

at 330km/h

3300m
Global Tier-1 partner of choice for OEMs and rail operators in all regions

### Top 10 customers 2020 (% of sales)

<table>
<thead>
<tr>
<th>Customer</th>
<th>Sales Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRRC</td>
<td>~17%</td>
</tr>
<tr>
<td>Bombardier</td>
<td>~6%</td>
</tr>
<tr>
<td>Alstom</td>
<td>~5%</td>
</tr>
<tr>
<td>Indian Railways</td>
<td>~4%</td>
</tr>
<tr>
<td>Stadler</td>
<td>~4%</td>
</tr>
<tr>
<td>Siemens</td>
<td>~4%</td>
</tr>
<tr>
<td>Transmashholding</td>
<td>~3%</td>
</tr>
<tr>
<td>Hitachi</td>
<td>~3%</td>
</tr>
<tr>
<td>Hitachi</td>
<td>~2%</td>
</tr>
</tbody>
</table>

**Top 10 = 54% of total RVS sales 2020**

### Other major Knorr-Bremse customers

#### Europe / Africa

- ANGEL
- Frecciarossa
- SNCF
- IR
- DB
- ÖBB
- DSB

#### Americas

- CP
- AMTRAK
- BNSF
- CSX

#### Asia / Australia

- JR
- Kinkisharyo
- Kawasaki
- Hyundai Rotem
- TRAM TRANSMASHOLDING
- SKODA

---

Notes: 2020 sales and customer data based on 31.12.2020; Share of top 10 customers as % RVS sales 2020 may not add up due to rounding.

Fact Book 36
RVS holds global #1 position across key product categories

Global market share 2020¹ (% of revenues)

- **Brake systems** (~68% of RVS revenues):
  - Market size: ~€ 4.5bn
  - Knorr-Bremse: 50%
  - Wabtec/Faiveley: 15%
  - Others: 35%

- **Entrance systems** (~9% of RVS revenues):
  - Market size: ~€ 1.1bn
  - Knorr-Bremse: 25%
  - Kangni: 20%
  - Wabtec/Faiveley: 15%
  - Others: 40%

- **HVAC** (~7% of RVS revenues):
  - Market size: ~€ 1.1bn
  - Knorr-Bremse: 20%
  - King: 15%
  - Wabtec/Faiveley: 10%
  - Others: 55%

Notes: Based on German GAAP (HGB); Market share estimates are rounded to the nearest multiple of 5%; For competitors, a price estimate was used; ¹) Market share estimates for OE and AM without labor. Source: Knorr-Bremse information and internal market research.
Historic development of OE and AM business

Strong growth both in OE and AM

RVS sales by type (until 2017 German Gaap/HGB, 2018-2020 IFRS, €bn, 2010-2021) ¹)

Note: some figures may not add up due to rounding; 1) BillRUG sales allocated proportionally between OE and aftermarket

CAGR (2010-2021)

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>AM</th>
<th>OE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>2.0</td>
<td>1.5</td>
<td>0.5</td>
</tr>
<tr>
<td>2011</td>
<td>2.2</td>
<td>1.5</td>
<td>0.7</td>
</tr>
<tr>
<td>2012</td>
<td>2.2</td>
<td>1.5</td>
<td>0.7</td>
</tr>
<tr>
<td>2013</td>
<td>2.2</td>
<td>1.4</td>
<td>0.8</td>
</tr>
<tr>
<td>2014</td>
<td>3.0</td>
<td>2.0</td>
<td>1.0</td>
</tr>
<tr>
<td>2015</td>
<td>3.3</td>
<td>2.1</td>
<td>1.2</td>
</tr>
<tr>
<td>2016</td>
<td>3.0</td>
<td>1.8</td>
<td>1.2</td>
</tr>
<tr>
<td>2017</td>
<td>3.3</td>
<td>1.9</td>
<td>1.4</td>
</tr>
<tr>
<td>2018</td>
<td>3.5</td>
<td>2.1</td>
<td>1.4</td>
</tr>
<tr>
<td>2019</td>
<td>3.7</td>
<td>2.1</td>
<td>1.5</td>
</tr>
<tr>
<td>2020</td>
<td>3.3</td>
<td>1.8</td>
<td>1.5</td>
</tr>
<tr>
<td>2021</td>
<td>3.3</td>
<td>1.8</td>
<td>1.5</td>
</tr>
</tbody>
</table>

¹) CAGR (2010-2021)
RVS grew within each business unit, despite Covid impact, AM outperformed

Revenue development
in €bn

[Index 100 = 2012]

<table>
<thead>
<tr>
<th>Year</th>
<th>OE</th>
<th>AM</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>2.2</td>
<td>3.3</td>
</tr>
<tr>
<td>2020</td>
<td>3.3</td>
<td>3.3</td>
</tr>
</tbody>
</table>

Constant increase in the installed base...  ... drives the profitable Aftermarket

Brakes  Doors  HVAC  Others  Brakes  Doors  HVAC  Others

2012: Brakes x1.2, Doors x1.1, HVAC x1.1, Others x1.8
2020: Brakes x1.9, Doors x2.0, HVAC x2.6, Others x2.6

2012:
- Brakes: 2.3%
- Doors: 1.7%
- HVAC: 1.6%
- Others: 7.2%

2020:
- Brakes: 8.6%
- Doors: 9.0%
- HVAC: 12.4%
- Others: 12.9%

Constant increase in the installed base...  ... drives the profitable Aftermarket

KNORR-BREMSE (OE)

KNORR-BREMSE (AM)

Fact Book
Aftermarket business will continue to be an important growth engine

**Revenue split 2021 in €bn**

- OE: 54%
- AM: 46%
- Total: 3.3

**Long-term goal** > 45%

**Opportunities**
- Use installed fleet
- Modernization
- New service models & digital solutions

**Challenges**
- Competition by OEMs, focusing more on service
- Insourcing and lifecycle costs optimization, including stretching overhaul cycles
**CO₂ emission targets not achievable in transportation without rail**

Greenhouse gas emissions from transport¹

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>214</td>
<td>143</td>
<td>111</td>
</tr>
<tr>
<td>143</td>
<td>80</td>
<td>30</td>
</tr>
<tr>
<td>29</td>
<td>55</td>
<td>17</td>
</tr>
</tbody>
</table>

1) 2019, reference for Germany, Sources: [https://www.allianz-pro-schiene.de/themen/umwelt/daten-fakten/](https://www.allianz-pro-schiene.de/themen/umwelt/daten-fakten/) (accessed on September 8, 2021), based on Umweltbundesamt
RVS is the only supplier world-wide certified for all local standards and norms

<table>
<thead>
<tr>
<th>Market protected by unique level of complexity …</th>
<th>... and long homologation time for each component</th>
<th>Typical time-to-market</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major global standards</td>
<td>Key regions</td>
<td>Development (yrs)²</td>
</tr>
<tr>
<td>Unique configurations for vehicle types</td>
<td></td>
<td>Certification (yrs)²</td>
</tr>
<tr>
<td>Brake subsystems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety-critical components</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country- and customer-specific variants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100k active brakes articles to homologate</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standard¹</th>
<th>Key regions</th>
<th>Development (yrs)²</th>
<th>Certification (yrs)²</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOST</td>
<td>YIC</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>UIC</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>GOST</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Association of American Railroads</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

Combination of IP ownership and homologation creates high barriers to entry

¹) GOST based on recent homologation process, other norms based on expert estimates by Knorr-Bremse; ²) Estimated average required "time-to-market" of a basic freight car solution
Agenda

- Introduction
- Key Company Highlights
- Rail Vehicle Systems (RVS)
- **Commercial Vehicle Systems (CVS)**
- R&D Focus
- Financials
- Sustainability
- Capital Markets Summary
- Appendix
CVS with high-quality business model – Outperformance and resilience

**Market leadership**
A global market leader increasing market share (~25% for brake systems & vehicle dynamics)

**Strong growth profile**
Continuously outperforming markets with rising content per vehicle (7% sales CAGR vs. ~3% TPR growth between 2012-2019)

**Technology innovation**
Technology leader with continuous significant investment in innovation and R&D

**High safety requirements**
Global key supplier with system know-how and vehicle dynamics capabilities

**Resilience**
Strong aftermarket share (~27% revenue share), cost efficiency, regional diversification as well as track record in strong cost management execution

**Profitability**
Technology differentiation, superior products, systems approach, scale advantage and consequent cost management (operating EBIT margin ~11%)
CVS – One of two global leaders with an outstanding position in braking and safety-relevant systems

<table>
<thead>
<tr>
<th>Highlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️ Global market position¹</td>
</tr>
<tr>
<td>🏆 Technology leader</td>
</tr>
<tr>
<td>🏆 Global market share</td>
</tr>
<tr>
<td>🧑‍🔧 c.12k Employees</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2021 key financials</th>
</tr>
</thead>
<tbody>
<tr>
<td>€3.8bn sales</td>
</tr>
<tr>
<td>6.5% CAGR 2010-2021²</td>
</tr>
<tr>
<td>€501m EBITDA (14.8% margin)</td>
</tr>
<tr>
<td>€361m EBIT (10.7% margin)</td>
</tr>
<tr>
<td>27% aftermarket share</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2021 sales split³</th>
</tr>
</thead>
<tbody>
<tr>
<td>by region</td>
</tr>
<tr>
<td>Europe 42%</td>
</tr>
<tr>
<td>Americas 35%</td>
</tr>
<tr>
<td>Asia /Australia 23%</td>
</tr>
<tr>
<td>by end-market</td>
</tr>
<tr>
<td>AM 27%</td>
</tr>
<tr>
<td>OE 63%</td>
</tr>
</tbody>
</table>

Notes: Sales, EBITDA, EBIT and respective margins based on IFRS; other figures based on German GAAP (HGB) ¹) 2020 global addressable Truck, Bus and Trailer OE market.; ²) Total reported CVS sales growth including OE and AM ³) Sales split by region based on IFRS; Other splits based on German GAAP (HGB)
## Knorr-Bremse is the partner of choice for global OEMs with long-standing relationships

### Top 10 customers 2020 (% of sales)

<table>
<thead>
<tr>
<th>Customer</th>
<th>% of Sales</th>
<th>Years of Relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>PACCAR</td>
<td>11%</td>
<td>&gt;30</td>
</tr>
<tr>
<td>DAIMLER</td>
<td>11%</td>
<td>&gt;90</td>
</tr>
<tr>
<td>TRATON</td>
<td>8%</td>
<td>&gt;30</td>
</tr>
<tr>
<td>NAVISTAR</td>
<td>8%</td>
<td>&gt;90</td>
</tr>
<tr>
<td>NAVISTAR</td>
<td>4%</td>
<td>&gt;20</td>
</tr>
<tr>
<td>DONGFENG</td>
<td>4%</td>
<td>&gt;5</td>
</tr>
<tr>
<td>WEICHAI</td>
<td>4%</td>
<td>&gt;5</td>
</tr>
<tr>
<td>ZF</td>
<td>3%</td>
<td>&gt;30</td>
</tr>
<tr>
<td>IVECO</td>
<td>3%</td>
<td>&gt;90</td>
</tr>
<tr>
<td>ISUZU</td>
<td>3%</td>
<td>&gt;60</td>
</tr>
</tbody>
</table>

### Years of relationship

- Top 10 = 59% of total CVS sales 2020

### Other major Knorr-Bremse customers

- BLUE BIRD
- BYD
- CATERPILLAR
- FAW
- FOTON
- HYUNDAI
- HINO
- KRONE
- SAF Holland
- SCHMITZ CARGOBULL
- TATA
- FORD

1) Share of top 10 customers as % RVS sales 2020 may not add up due to rounding
CVS is market leader in all major product fields

Global market share 2021¹ (% of revenues)

- **Brake Systems & Vehicle Dynamics²**
  - Knorr-Bremse 25%
  - ZF/Wabco 19%
  - Others 56%

- **Energy Supply & Distribution³**
  - Knorr-Bremse 49%
  - ZF/Wabco 27%
  - Others 24%

- **Fuel Efficiency⁴**
  - Knorr-Bremse 23%
  - ZF/Wabco 22%
  - Others 55%

2) Air Disc Brake, Valves / Pedal Unit, Actuators, Foundation Drum Brake, Steering, ABS, EBS, ESP, DAS, ELC; incl. segment Others
3) Compressors, Air Treatment
4) Vibration Dampers, Engine Air Control, Transmission – Gear and clutch actuation

Fact Book 47
Complementary product portfolio provides foundation for positioning as key integrated systems and services provider

Knorr-Bremse CVS comprehensive offering
Historic development of OE and AM business

Strong growth both in OE and AM

CVS sales by type (HGB, €bn, 2010-2017) 1) 2018-21 IFRS

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>1.1</td>
<td>0.6</td>
<td>0.6</td>
<td>1.4</td>
<td>1.4</td>
<td>1.5</td>
<td>1.7</td>
<td>1.8</td>
<td>2.1</td>
<td>2.4</td>
<td>2.4</td>
<td>2.1</td>
</tr>
<tr>
<td>2011</td>
<td>1.4</td>
<td>1.4</td>
<td>0.6</td>
<td>0.6</td>
<td>0.7</td>
<td>1.7</td>
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<td>0.7</td>
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<tr>
<td>2021</td>
<td>3.4</td>
<td>0.9</td>
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<td>0.8</td>
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<td>2.1</td>
<td>2.5</td>
</tr>
</tbody>
</table>

CAGR (2010-2021)

- **Total**: 6.5%
- **AM**: 3.8%
- **OE**: 7.7%

Notes: 1) Some sales split may not add up due to rounding; 2) BilRUG sales allocated proportionally between OE and aftermarket; 3) Global Truck and Bus market excluding aftermarket and Trailer; 4) Source: Knorr-Bremse information and internal market research; 5) IHS for truck production rate.
Conversion in legislation drives the global adoption of technologies provided by Knorr-Bremse


Legislative decisions foster demand for Knorr-Bremse solutions

Fuel Efficiency – Vision Zero Emission

Legislation on Product Solutions

Traffic Safety – Vision Zero Accident

Legislation on Emission Standards

Notes: 1) Approved in May 2018, government intends to stimulate efficiency & vehicle safety; 2) European Commission: COM(2018) 286 & Vulnerable Road Users Directive (VRUD); 3) General Administration of Quality Supervision, Inspection & Quarantine of People’s Republic of China, technical specification for safety of power driven vehicles operating in roads; Source: Knorr-Bremse internal market research; Roland Berger market study: Trends in the truck & trailer market (August 2018)
# CVS growth opportunities driven by higher CPV despite limited volume growth

## Truck production is flat and does not contribute to growth
Growth driver will be the current content per vehicle (CPV) with traffic safety technologies until mid 2020s
In the long run, CPV must be driven by technologies for new trends automated driving, e-mobility and connectivity

<table>
<thead>
<tr>
<th></th>
<th>Global(^1)</th>
<th>North America(^2)</th>
<th>Europe(^3)</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Truck production CAGR</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mid-term until mid-20s</td>
<td>0%</td>
<td>0%</td>
<td>-1%</td>
<td></td>
</tr>
<tr>
<td>Long-term until 2030</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td></td>
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<tr>
<td>Long-term until mid-20s</td>
<td>+2%</td>
<td>+1%</td>
<td>-1%</td>
<td></td>
</tr>
<tr>
<td>Long-term until 2030</td>
<td>+2%</td>
<td>+1%</td>
<td>-2%</td>
<td></td>
</tr>
</tbody>
</table>

**Growth in KB CPV with traffic safety solutions**
- Global: ~ +4\%
- North America: <4\%
- Europe: <4\%
- China: >4\%

**Growth in KB CPV focus on technologies for automated driving, e-mobility & connectivity**

1) Incl. Turkey & Korea  
2) Class 6 – 8  
3) West & East Europe

Source: Knorr-Bremse analysis, IHS Markit, McKinsey analysis
New growth areas for CVS

Illustrative growth potential

Growth contribution of industry trends

World’s leading supplier of safety relevant CV systems
Grow in current portfolio
Generate new business by optimizing TCO and emissions along the truck lifecycle

Traffic safety

Today 2025 2030 Time

Automated driving
Connectivity
Emission Reduction & E-Mobility

Current CVS portfolio with focus on traffic safety perfectly fits market demands
In the future however, CVS will gain more content per vehicle growth with solutions for Automated Driving, Emission Reduction & E-Mobility and Connectivity
CVS offers both driver assistance and automated driving solutions

<table>
<thead>
<tr>
<th>Degree of Automation</th>
<th>Driver Only</th>
<th>Assisted</th>
<th>Partial Automation</th>
<th>High Automation</th>
<th>Full Automation</th>
<th>Driverless</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>Driver Only</td>
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<td>Full Automation</td>
<td>Driverless</td>
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<tr>
<td>1</td>
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<td>Full Automation</td>
<td>Driverless</td>
</tr>
<tr>
<td>2</td>
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<td>Assisted</td>
<td>Partial Automation</td>
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<td>Driverless</td>
</tr>
<tr>
<td>3</td>
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<td>Full Automation</td>
<td>Driverless</td>
</tr>
<tr>
<td>4</td>
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<td>Full Automation</td>
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<tr>
<td>5</td>
<td>Driver Only</td>
<td>Assisted</td>
<td>Partial Automation</td>
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<td>Full Automation</td>
<td>Driverless</td>
</tr>
</tbody>
</table>

**Driver Assistance**
- Braking
- Steering
- Sensors
- Level 1 and 2 functions

**Automated Driving**
- CVS as vehicle dynamics supplier in consortium/partnership approach
- Braking
- Steering
- Vehicle dynamics
- Related redundancy

---

CVS as a system supplier

- Braking
- Steering
- Sensors
- Level 1 and 2 functions

---

KNORR-BREMSE

Fact Book 53
CVS offers automated driving solutions in a partnership approach - Actuation, Truck Motion Control and Redundancy are CVS’ core competencies.

- **Perception**: Complete environment perception of truck & trailer
  - Software: Provided by partner
  - Sensor Hardware: Provided by partner

- **Decision**: Continuous situation analysis, motion planning and definition of driving path
  - Software (driver stack): Provided by partner

- **Actuation**: Coordinated interaction of actuators for vehicle dynamics
  - Braking system, steering system incl. redundancy system: Provided by Knorr-Bremse

---

**Redundancy system**

- Provided by partner
- Provided by Knorr-Bremse
- Provided by Knorr-Bremse

---

**Big OE or system supplier as system integrator**
Knorr-Bremse teams up with Continental to become a leading Automated Driving system supplier for commercial vehicles

- Function know-how based on passcar experience & carryover from passcar
- Hardware for localization (radar, camera) and Automated Driving Control Unit

- Truck- & trailer-specific vehicle dynamics: Vehicle guidance and stability control
- Fail-operational architecture
- Commercial vehicle-specific function development, application and release

Consumer Benefits
- Industry benchmark perception decision and actuation from the one source
- Superior performance through full-system approach
- Cost-optimized systems for commercial vehicles

Joint Project Scope
- Development of systems, components and functionality for Automated Driving
- Validation and release of complete highly Automated Driving systems
- Collaboration in joint project house
Truck Motion Control combines braking, steering and vehicle dynamics

Roadmap ADAS¹ and Highly Automated Driving

- Braking
- Stability control
- Driver assistance (Longitudinal control)
- Driver assistance (Lateral control)
- Automated driving functions

Brake system

Combined steering and braking

Truck Motion Control

→ Successful M&A strategy
→ KB global #2 steering supplier

KB driving steering innovation and vehicle content growth

- Base steering gear
- Torque overlay steering (TOS) for ADAS¹ functions and Automated Driving
- Electric Power Steering

Brake control

Steering

CV system competence

Combined competencies enable Truck Motion Control for safe vehicle control under all conditions

1) ADAS = Advanced Driver Assistance Systems
Different offerings for automated driving in a partnership approach

Stand-alone KB offering:
- Actuation, Truck Motion Control and Redundancy supplied by CVS

In partnership as a consortium:
- System with actuation, TMC, perception & hardware for the decision layer together with Continental as sensors and hardware partner
- Complete system including driver stack in collaboration with an AI partner in addition to the sensors and hardware partner

CVS fosters system competency and future content per vehicle increase potential

- General requirement for redundant Electric/Electronics architecture increases content per vehicle → redundancy ensures the safe vehicle movement even in case of the failure of a system relevant component
- The addition of torque overlay steering to CVS’ portfolio adds content to the vehicle, more advanced steering solutions at higher price further increase content per vehicle
CVS will benefit from transition of integrated combustion engine trucks towards electrified trucks

Impact for CVS

- Shift from ICE to EV vehicles offers **first mover advantage**
- More complex Electrics/Electronics architecture in electric vehicles **increases content per vehicle**
- KB products in “other systems” and in energy storage offer **growth potential for CVS**
- Value reduction in drivetrain **does not affect CVS significantly**
- Potential content per vehicle increase via **electric vehicle adapted products** and **completely new product fields**
CVS founded an internal incubation unit for e-mobility solutions

Defining our role in the environment of the e-mobility ecosystem for commercial vehicles

- Adaptation of existing product portfolio towards EV
- Definition of new product fields
- First product concepts already transferred to CVS business units
- 52 patents applications have been generated out of the CVS e-Cubator until today
CVS is offering a broad product portfolio for electric trucks

**EV adapted portfolio**

- **eCompressor**
  - Electric screw compressor
  - Mid air demand eCompressor (rotary vane)
  - Low air demand compressor for future EV requirements

**EV brake control & vehicle dynamics**

- Optimized and scalable holistic EV motion control, including energy recuperation

**New EV product fields**

- **Redundant power management system**
- **EV brake resistor**
- **Opportunities in fuel cell electric vehicles in assessment**

*on the market  market launch soon  in development  in assessment*
Internationalisation: Global growth strategy focuses on North America penetration as well as Chinese and Indian market share expansion

- **Exploit leading position**
  - Bendix acquisition as enabler for footprint expansion
  - Sheppard acquisition to strengthen position as global system supplier of integrated steering and braking systems
  - Capitalisation of technological expertise and brand
  - Increased content per vehicle (technology as driver)
  - Continuous cost structure improvements

- **Leverage local presence**
  - Intensive localisation with key local players
  - Capitalise on strong position in OE channel
  - Increased content per vehicle (technology as driver)
  - Expand network to establish truck aftermarket
  - Exploit position in electric bus

- **Expand market share**
  - Strong business growth with major Indian customers
  - Expansion of product portfolio (dampers, drum brakes)
  - Localisation programme creating scale effects

Notes: Based on German GAAP (HGB); FTE includes leasing (EOP) 1) Plant under expansion; Source: Knorr-Bremse information
Agenda

- Introduction
- Key Company Highlights
- Rail Vehicle Systems (RVS)
- Commercial Vehicle Systems (CVS)
- R&D Focus
- Financials
- Sustainability
- Capital Markets Summary
- Appendix
R&D is at the very core of Knorr-Bremse’s DNA

With over **12,000 patents**¹
Knorr-Bremse secures the future innovation roadmap. Largest patent portfolio in the industry²

Significant synergies between RVS and CVS

5 state-of-the-art R&D centres globally complemented by 23 local engineering entities with customer proximity

Focused & disciplined approach ensuring highest efficiency

More than **80%** of the most industry-defining innovations over the last decades came from Knorr-Bremse

Extensive external network with over **15 R&D partnerships**

**Long-term targeted R&D ratio:** 6-7% of revenues³

Notes: 1) Granted and applied patents; 2) Based on published number of patent families (granted and applied); 3) Knorr-Bremse 2020 R&D financial information based on IFRS;
R&D portfolio synergies between RVS and CVS...

<table>
<thead>
<tr>
<th>Services</th>
<th>Vehicle control &amp; automated driving</th>
<th>Chassis systems</th>
<th>Braking</th>
<th>Driving</th>
<th>Energy Supply &amp; Distribution</th>
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</thead>
<tbody>
<tr>
<td>Telematics (iCom maintenance, iTAP-push)</td>
<td>Driver assistance (ACC, AEB, ASR, LEADER)</td>
<td>Hydraulics</td>
<td>Wheelend / bogie equipment</td>
<td>Conventional actuation</td>
<td>Compressed air</td>
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<tr>
<td>Remote &amp; on-demand maintenance and diagnostics</td>
<td>Motion control</td>
<td>Electronics</td>
<td>Disc brake</td>
<td>Combustion engine components</td>
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<td>Training drivers/ work shops (Safety direct, simulator)</td>
<td>Brake control</td>
<td>HMI &amp; driver information (ITAP, etc.)</td>
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<td>Electronic actuation (Kiepe)</td>
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<td>Wear-resistant brakes</td>
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<td>Electromagnetic brake system</td>
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<td>Vehicle control (TCMS / UCS)</td>
<td>Entrance systems / doors</td>
<td>Eddy current brake</td>
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<tr>
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<td>Brake distance management / sanding</td>
<td>Air conditioning</td>
<td>Drum brake &amp; adjuster</td>
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<td>Vehicle dynamics</td>
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<td></td>
<td>Torque overlay steering system</td>
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</tbody>
</table>

In **>50% of Knorr-Bremse’s portfolio** the underlying technology can be applied to both divisions.
...resulting in synergies and cross-proliferation

Cross-divisional R&D examples

1985 Screw Compressor

1990 Air Disc Brake

1992 Air Disc Brake

2008 Collision Avoidance

2011 Screw Compressor

2021/2022 Collision Avoidance

Screw Compressor technology adopted for CVS applications

Technology transfer for ADB from RVS to CVS

Collision Avoidance for RVS based on CVS system know-how within the field of sensor technology

✓ Faster time-to-market
✓ Higher cost benefit
✓ Focused customer solutions

Fact Book 65
Leveraging Knorr-Bremse’s synergies & partnerships: centres of excellence as basis for sustained technology leadership

Globally $\Sigma \approx 3.600$ FTE\(^1\)

Knorr-Bremse’s innovations are supported by a network of specialized development centres with joint production and R&D

Notes: 1) FTE refers to number of employees in R&D function (includes engineers, technicians, merchants) EOP 2019, TCI allocated to Asia
Knorr-Bremse deploys structured and effective processes to drive innovation results

Knorr-Bremse R&D process

Knorr-Bremse’s innovations are designed for clear customer impact... 
- Optimisation of TCO\(^1\)
- Reduction of energy consumption, noise, weight
- Safety & reliability
- Connectivity, wireless solutions, ethernet
- Adaption to regulation

...and maximum economic benefit for Knorr-Bremse
- All projects assessed based on NPV\(^2\)
- Prioritisation of projects according to IRR\(^3\)
- Optimise time-to-market
- Short payback time of investment
- Ability to leverage innovation across customer portfolio

Notes: 1) TCO refers to total cost of ownership; 2) NPV refers to net present value; 3) IRR refers to internal rate of return

Fact Book  67
Close co-operation with customers & strategic partners

**Government partnerships**
- Shift2Rail: EU supported initiative amongst suppliers and OEMs to jointly develop an efficient transportation system
- VDA\(^1\) participation in ~20 committees
  - Design of norms/standards
  - Early anticipation of industry trends
  - Grants/subsidies

**VC partnerships with Start-ups**
- Partnerships with accelerators
- Investment in start-ups
  - Technology access
  - R&D acceleration

**Partnerships with Universities**
- Research cooperations
  - Access to future talent
  - Scouting of new technologies at minimal cost

**JVS with OEMs / technology partners**
- 18 joint ventures globally
- Joining complementary competences to extend product and service lines, and capacities
  - IP protection
  - Local presence
  - Flexible solutions for customers

---

Countries Knorr-Bremse is present

Notes: 1) VDA - Verband der Automobilindustrie (German Association of the Automotive Industry)
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Financial excellence foundation: success factors for future profitable growth fully intact

- Focus on attractive market segments
- Technology and market leadership
- Entrepreneurial culture
- Strong execution
- Efficient capital allocation
- Strong bottom-line-/cost focus with lean set-up
- Pricing power
- High aftermarket exposure and resilience

Profitable growth
Track record of strong and sustainable top-line growth …

Historical sales\(^1\)\(^2\) by division

(€m)

<table>
<thead>
<tr>
<th>Year</th>
<th>RVS</th>
<th>CVS</th>
<th>CAGR(^2)</th>
</tr>
</thead>
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<td>2.743</td>
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<td>2008</td>
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<td>2010</td>
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<td>2021</td>
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<td>3.390</td>
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</tr>
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</table>

Notes: 1) Divisional historic figures do not add up to group sales excluding consolidations/other; 2) 2014 represents the first year that Knorr-Bremse prepared its financial statements in accordance with IFRS. Prior to 2014, financial statements were only prepared in accordance with German GAAP (HGB). IFRS differs in certain aspects from German GAAP (HGB), and accordingly data presented in accordance with German GAAP (HGB) may not be comparable to data prepared in accordance with IFRS; Source: Knorr-Bremse information
... combined with disproportionate EBITDA growth

**Historical EBITDA**

(€m)

<table>
<thead>
<tr>
<th>Year</th>
<th>HGB</th>
<th>IFRS</th>
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<tbody>
<tr>
<td>2005</td>
<td>349</td>
<td>338</td>
</tr>
<tr>
<td>2006</td>
<td>410</td>
<td>468</td>
</tr>
<tr>
<td>2007</td>
<td>438</td>
<td>504</td>
</tr>
<tr>
<td>2008</td>
<td>420</td>
<td>516</td>
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<tr>
<td>2009</td>
<td>268</td>
<td>523</td>
</tr>
<tr>
<td>2010</td>
<td>528</td>
<td>517</td>
</tr>
<tr>
<td>2011</td>
<td>667</td>
<td>624</td>
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<tr>
<td>2012</td>
<td>628</td>
<td>639</td>
</tr>
<tr>
<td>2013</td>
<td>678</td>
<td>704</td>
</tr>
</tbody>
</table>

**CAGR**

<table>
<thead>
<tr>
<th>Group</th>
<th>2005-20</th>
<th>2010-19</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8.0%</td>
<td>7.8%</td>
</tr>
</tbody>
</table>

**Notes:**
1) Divisional historic figures do not add up to group sales excluding consolidations/other; 2) 2014 represents the first year that Knorr-Bremse prepared its financial statements in accordance with IFRS. Prior to 2014, financial statements were only prepared in accordance with German GAAP (HGB). IFRS differs in certain aspects from German GAAP (HGB), and accordingly data presented in accordance with German GAAP (HGB) may not be comparable to data prepared in accordance with IFRS;

Source: Knorr-Bremse information.
... all supported by solid aftermarket sales growth

### RVS – Aftermarket sales

<table>
<thead>
<tr>
<th>Year</th>
<th>(€m)</th>
<th>CAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>971</td>
<td></td>
</tr>
<tr>
<td>2021</td>
<td>1,518</td>
<td>6.6%</td>
</tr>
</tbody>
</table>

### CVS – Aftermarket sales

<table>
<thead>
<tr>
<th>Year</th>
<th>(€m)</th>
<th>CAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>701</td>
<td></td>
</tr>
<tr>
<td>2021</td>
<td>905</td>
<td>3.7%</td>
</tr>
</tbody>
</table>

Notes: 1) Based on IFRS; BillRUG sales allocated proportionally between OE and aftermarket
FY21: Order Intake for Group, RVS & CVS

**Group**

<table>
<thead>
<tr>
<th>(€m)</th>
<th>FY20</th>
<th>Organic</th>
<th>M&amp;A</th>
<th>FX</th>
<th>FY21</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6,442</td>
<td>861</td>
<td>53</td>
<td>-69</td>
<td>7,287</td>
</tr>
<tr>
<td>Book-to-bill</td>
<td>1.05</td>
<td>1.09</td>
<td>+13.1%</td>
<td></td>
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</tr>
</tbody>
</table>

**RVS**

<table>
<thead>
<tr>
<th>(€m)</th>
<th>FY20</th>
<th>Organic</th>
<th>M&amp;A</th>
<th>FX</th>
<th>FY21</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3,485</td>
<td>25</td>
<td>-32</td>
<td>-7</td>
<td>3,471</td>
</tr>
<tr>
<td>EVAC</td>
<td>€ 25m (FY21)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R.H. Sheppard</td>
<td>€ 28m (Q1/21)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(€m)</th>
<th>FY20</th>
<th>Organic</th>
<th>M&amp;A</th>
<th>FX</th>
<th>FY21</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2,954</td>
<td>898</td>
<td>28</td>
<td>-62</td>
<td>3,818</td>
</tr>
<tr>
<td>EVAC</td>
<td>€ 25m (FY21)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>R.H. Sheppard</td>
<td>€ 28m (Q1/21)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
FY21: Revenue for Group, RVS & CVS

**Group (€m)**

- FY20: 6,157
- FY21: 6,706

**Change:** +8.9%

**EVAC**
- €31m (FY21)
- R.H. Sheppard
  - €29m (Q1/21)

**RVS (€m)**

- FY20: 3,337
- FY21: 3,317

**Change:** -0.6%

**EVAC**
- €31m (FY21)

**CVS (€m)**

- FY20: 2,819
- FY21: 3,390

**Change:** +20.2%

**R.H. Sheppard**
- €29m (Q1/21)
FY21: op. EBIT for Group, RVS & CVS

**Group**

- FY20: €814 (13.2%)
- FY21: €912 (13.6%)
- Change: +12.1%

**RVS**

- FY20: €637 (19.1%)
- FY21: €599 (18.1%)
- Change: -5.9%

**CVS**

- FY20: €235 (8.3%)
- FY21: €361 (10.7%)
- Change: +53.6%

_Notes:_
- EVAC: €0.1m (FY21)
- R.H. Sheppard: €-2m (Q1/21)
- Reported: 920 (13.7%)
Agenda

- Introduction
- Key Company Highlights
- Rail Vehicle Systems (RVS)
- Commercial Vehicle Systems (CVS)
- R&D Focus
- Financials
- **Sustainability**
- Capital Markets Summary
- Appendix
The basis of our responsibility

<table>
<thead>
<tr>
<th>Our values</th>
<th>UN Global Compact</th>
<th>CR Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrepreneurship</td>
<td>Commitment to ten basic principles:</td>
<td>- Comprises our understanding of Corporate Responsibility</td>
</tr>
<tr>
<td>Technological Excellence</td>
<td>- Human rights</td>
<td>- Sets down guidelines for our CR focus areas</td>
</tr>
<tr>
<td>Reliability</td>
<td>- Labor standards</td>
<td>- Points out the main focus of our efforts to realize social and environmental responsibility</td>
</tr>
<tr>
<td>Passion</td>
<td>- Environmental protection</td>
<td></td>
</tr>
<tr>
<td>Responsibility</td>
<td>- Anti-corruption</td>
<td></td>
</tr>
</tbody>
</table>

Growing with Values.

Entrepreneurship, Technological Excellence, Reliability, Passion, Responsibility.
### Our CR policy and focus areas

#### Strategy and management

We aim for **sustainable value creation**. By this we understand achieving long-term economic success while at the same time acting responsibly towards our employees and business partners as well as the environment and society.

We are committed to **sustainable corporate governance** that includes environmental and social aspects in strategic planning, management and corporate processes.

We act and work according to **legal and ethical principles** laid down in our Group-wide Code of Conduct.

#### Products and partners

We consistently work on developing **innovative products** and solutions that combine a high degree of customer value with a contribution to sustainable development. Safety is always our overriding goal.

We **work closely with our customers and suppliers** to jointly ensure continuous improvement of product quality and minimal undesirable impact on the environment and society.

We take into account and support the activities of our **business partners aimed at improving their environmental and social compatibility**.

#### Employees and governance

We create an attractive working environment in which the principles of **mutual trust, team-work, diversity and equality of opportunity** as well as fair and respectful treatment of each other are recognized and practiced.

We offer a **safe and healthy working environment** and enable our employees to develop their **own individual potential**.

We conduct an ongoing **dialogue with our managers** on the subject of value-oriented, sustainable corporate governance.

#### Environment and climate

We accept our **responsibility for ensuring a clean environment and protecting the climate** and operate in compliance with our **HSE Policy** (Healthy, Safety and Environment).

We have set ourselves the goal of handling **resources in a responsible manner**, consistently reducing **CO₂ emissions**, minimizing and where possible avoiding undesirable **impact on nature and the environment** and actively using opportunities to **protect the environment**.

We are concerned to optimize the **environmental compatibility** of our products across their **entire life-cycle**.

#### Commitment and society

We are involved, as a member of society, in **social issues** and are engaged world-wide as a **good corporate citizen**. We supplement the activities of the charitable organization Knorr-Bremse Global Care e.V. with social projects implemented directly at our production sites (Local Care).

We encourage and support **social involvement on the part of our employees**.

We see ourselves as **partners for the regions** in which we live and work, and we support their long-term development.

#### Communication and co-operation

We seek constructive **dialogue with our stakeholders** and provide them with regular and transparent updates on our sustainability activities.

We support social, educational and environmental projects and enter into **partnerships with organizations** that contribute towards sustainable development.
In 2018 Knorr-Bremse selected its Core Sustainable Development Goals (SDGs)
Carbon neutrality from 2021

- KB renews its climate strategy with even more ambitious targets
- 50% CO₂ emission reduction by 2030
- Additionally: Increasing purchase of renewable energy and carbon offsetting
- Starting point of CO₂ emissions in 2018 at 143,000 tons

Contribution by our products

- Rail is a cornerstone of eco-friendly transport solutions
- Truck products support lower fuel consumption
- ~9% of KB’s revenues are driven by remanufactured and recycled products
- Circular economy supported by remanufactured and overhauled products

Focus on 5 SDGs

- In 2018 ~150 top managers of KB committed to 5 core United Nations Sustainability Development Goals
- Sponsorship of Executive Board Members to drive initiatives around the KB world

Knorr-Bremse AG is part of the new DAX 50 ESG index
The KB climate strategy 2030

- Reduction measures for 2020
  - Energy efficiency
  - Own production
  - Green power supply
  - Compensation

- Governance for the implementation
  - House of Climate Initiative Group

- Implementation Control
  - Integration with existing financial controlling process
  - Steering of the target achievement via to be defined sub-targets
Fostering ESG ambitions: high ESG commitment embedded in newly defined strategy and remuneration

**Environment**
- **Climate strategy**
  - Carbon neutrality (incl. off-setting) at KB sites by 12/21
  - Triple own photovoltaic capacity by 2030
  - Extend to Scope 3 target setting
- **Circular economy**
  - Higher share from remanufactured/recycled products (currently: ~10% of revenues)

**Social**
- **Diversity**
  - Improve gender balance in global workforce and mgmt.
- **Safety at work**
  - Workplace accidents <1 per 200,000 hours worked
- **Social projects**
  - Global Care: Strengthen strategic partnerships
  - Local Care: Increase employee engagement

**Governance**
- **Compliance**
  - Global anti-corruption training for high-risk employee groups; certification of CMS design and effectiveness; strengthen Human Rights processes
- **Mgmt. remuneration**
  - Stringent cascading of ESG targets

**RATINGS:**
- Current: top 25 percentile
- Goal: at least top 25 percentile

New KPI in mgmt. compensation system as of 1.1.22 (20% STI weight)
Knorr-Bremse takes active part in corporate memberships throughout the world

United Nations Global Compact (participation since 2010)

<table>
<thead>
<tr>
<th>Membership</th>
<th>Country</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>APTA</td>
<td>USA</td>
<td>American Public Transportation Association</td>
</tr>
<tr>
<td>AAR</td>
<td>USA</td>
<td>Association of American Railroads</td>
</tr>
<tr>
<td>AIAG</td>
<td>USA</td>
<td>Automotive Industry Action Group</td>
</tr>
<tr>
<td>MEMA</td>
<td>USA</td>
<td>Motor &amp; Equipment Manufacturers Association</td>
</tr>
<tr>
<td>New York and New Jersey Minority Supplier Development Council</td>
<td>USA</td>
<td></td>
</tr>
<tr>
<td>UNIFE</td>
<td>BEL</td>
<td>Sustainable Transport Committee of the Union des Industries Ferroviaires Européennes</td>
</tr>
<tr>
<td>VDA</td>
<td>GER</td>
<td>Verband der Automobilindustrie e. V.</td>
</tr>
<tr>
<td>VDB</td>
<td>GER</td>
<td>Fachgruppe Umwelt im Verband der Bahnindustrie e. V.</td>
</tr>
<tr>
<td>APRA</td>
<td>GER</td>
<td>Automotive Parts Remanufacturers Association - Chairman Europe</td>
</tr>
<tr>
<td>Railsponsible</td>
<td></td>
<td>founding member (sustainable rail supply chain initiative)</td>
</tr>
<tr>
<td>Railsponsible</td>
<td></td>
<td>founding member (sustainable rail supply chain initiative)</td>
</tr>
<tr>
<td>Railsponsible</td>
<td></td>
<td>founding member (sustainable rail supply chain initiative)</td>
</tr>
<tr>
<td>Railsponsible</td>
<td></td>
<td>founding member (sustainable rail supply chain initiative)</td>
</tr>
</tbody>
</table>
Our 9 material (non-financial) corporate responsibility areas

Evaluation of non-financial facts was carried out on the basis of qualitative considerations regarding the extent of business relevance and its impact (2018)

- Anti-corruption and fair competition
- Energy and CO₂ emissions
- Employment conditions
- Product and system safety
- Personnel development
- Occupational safety and health protection
- Ecological product design
- Sustainability standards in the supply chain
- Diversity and equality
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- Appendix
## Share data

<table>
<thead>
<tr>
<th>Type of share</th>
<th>Bearer shares with no-par value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bloomberg ticker</strong></td>
<td>KBX</td>
</tr>
<tr>
<td><strong>Reuters ticker</strong></td>
<td>KBX.DE</td>
</tr>
<tr>
<td><strong>German security identification number (WKN)</strong></td>
<td>KBX100</td>
</tr>
<tr>
<td><strong>ISIN</strong></td>
<td>DE000KBX1006</td>
</tr>
<tr>
<td><strong>Shares outstanding as at December 31, 2018</strong></td>
<td>161,200,000</td>
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</table>
## Bond Data

### The Corporate Bonds of Knorr-Bremse AG

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<tr>
<th><strong>Security Identification Number</strong></th>
<th>A2LQP5</th>
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<tbody>
<tr>
<td><strong>International Securities Identification Number</strong></td>
<td>XS1837288494</td>
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<tr>
<td><strong>Issuer</strong></td>
<td>Knorr-Bremse AG</td>
</tr>
<tr>
<td><strong>Issuer ratings</strong></td>
<td>A2/outlook stable (Moody's), A/outlook stable (Standard &amp; Poor's)</td>
</tr>
<tr>
<td><strong>Volume</strong></td>
<td>EUR 750 million</td>
</tr>
<tr>
<td><strong>Term</strong></td>
<td>7 years</td>
</tr>
<tr>
<td><strong>Settlement</strong></td>
<td>June 14, 2018</td>
</tr>
<tr>
<td><strong>Maturity</strong></td>
<td>June 13, 2025</td>
</tr>
<tr>
<td><strong>Coupon</strong></td>
<td>1.125% p. a.</td>
</tr>
<tr>
<td><strong>Reoffer spread</strong></td>
<td>1.188% p. a.</td>
</tr>
<tr>
<td><strong>Listing</strong></td>
<td>EURO MTF Luxembourg</td>
</tr>
<tr>
<td><strong>Denomination</strong></td>
<td>EUR 1,000</td>
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<tr>
<td><strong>Applicable law</strong></td>
<td>German law</td>
</tr>
</tbody>
</table>

**Strong current rating: S&P (A) and Moody’s (A2)**
Agenda

- Introduction
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- Commercial Vehicle Systems (CVS)
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- Appendix
## Glossary (1/2)

<table>
<thead>
<tr>
<th>%</th>
<th>Percentage</th>
<th>CF</th>
<th>Cash flow</th>
<th>ELC</th>
<th>Electronic leveling control</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS</td>
<td>Anti-lock brake system</td>
<td>CFO</td>
<td>Chief Financial Officer</td>
<td>EOP</td>
<td>End of period</td>
</tr>
<tr>
<td>ACC</td>
<td>Adaptive Cruise Control</td>
<td>CKR</td>
<td>Czech Koruna</td>
<td>ESP</td>
<td>Electronic stability program</td>
</tr>
<tr>
<td>AD</td>
<td>Automated Driving</td>
<td>CNY</td>
<td>Chinese Yuan</td>
<td>EU</td>
<td>Europe, European Union</td>
</tr>
<tr>
<td>ADAS</td>
<td>Advanced driver assistance systems</td>
<td>CVS</td>
<td>Commercial Vehicle Systems</td>
<td>EUR</td>
<td>Euro</td>
</tr>
<tr>
<td>ADB</td>
<td>Air Disk Brake</td>
<td>D&amp;A</td>
<td>Depreciation &amp; Amortization</td>
<td>FTE</td>
<td>Full-time equivalent</td>
</tr>
<tr>
<td>AEBS</td>
<td>Advanced Emergency Braking System</td>
<td>DE</td>
<td>Germany</td>
<td>GAAP</td>
<td>Generally Accepted Accounting Principles</td>
</tr>
<tr>
<td>AG</td>
<td>Aktiengesellschaft (German: Stock Corporation)</td>
<td>DoI</td>
<td>Date of Implementation</td>
<td>GBP</td>
<td>British Pound</td>
</tr>
<tr>
<td>AM</td>
<td>Aftermarket</td>
<td>e</td>
<td>Expected</td>
<td>GDP</td>
<td>Gross domestic product</td>
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<tr>
<td>BDM</td>
<td>Brake Distance Management</td>
<td>EAC</td>
<td>Electronic Air Control</td>
<td>GSBC</td>
<td>Global Scalable Brake Control</td>
</tr>
<tr>
<td>bn</td>
<td>billion</td>
<td>EBIT</td>
<td>Earnings before Interest, Tax</td>
<td>HQ</td>
<td>Headquarters</td>
</tr>
<tr>
<td>CAGR</td>
<td>Compound Annual Growth Rate</td>
<td>EBITDA</td>
<td>Earnings before Interest, Tax, Depreciation, Amortization</td>
<td>HSR</td>
<td>High-speed rail</td>
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<td>CAPEX</td>
<td>Capital expense</td>
<td>EBS</td>
<td>Electronic brake system</td>
<td>HU</td>
<td>Hungary</td>
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<td>CEO</td>
<td>Chief Executive Officer</td>
<td>EGR</td>
<td>Exhaust Gas Reduction</td>
<td>HUF</td>
<td>Hungarian Forint</td>
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<td>Abbreviation</td>
<td>Description</td>
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<td>--------------</td>
<td>-------------</td>
<td></td>
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</tr>
<tr>
<td>HVAC</td>
<td>Heating, ventilation &amp; air conditioning</td>
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<td>LDW</td>
<td>Lane Departure Warning</td>
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<tr>
<td>TCO</td>
<td>Total cost of ownership</td>
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<td>International Automobil-Ausstellung (German: International Motor Show)</td>
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</tr>
<tr>
<td>m</td>
<td>million</td>
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<tr>
<td>TPR</td>
<td>Truck Production Rate</td>
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<td>IAM</td>
<td>Independent Aftermarket</td>
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<tr>
<td>M&amp;A</td>
<td>Merger &amp; acquisitions</td>
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</tr>
<tr>
<td>UIC</td>
<td>International union of railways</td>
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<tr>
<td>iCOM</td>
<td>Intelligent Condition-Oriented Maintenance</td>
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<td>OEM, OE</td>
<td>Original equipment manufacturer</td>
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<tr>
<td>US</td>
<td>United States</td>
<td></td>
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</tr>
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<td>USD</td>
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<td>IN</td>
<td>India</td>
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<td>OPEX</td>
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<td>WC</td>
<td>Working Capital</td>
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<tr>
<td>IoT</td>
<td>Internet of Things</td>
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</tr>
<tr>
<td>p.a.</td>
<td>per annum</td>
<td></td>
<td></td>
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<tr>
<td>IPO</td>
<td>Initial Public Offering</td>
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<tr>
<td>PWM</td>
<td>Private Wealth Management</td>
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<tr>
<td>JV</td>
<td>Joint venture</td>
<td></td>
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</tr>
<tr>
<td>R&amp;D</td>
<td>Research &amp; Development</td>
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<td>ROE</td>
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<td>Key Performance Indicator</td>
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<td>Train Control Management System</td>
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