

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



Frank Weber CFO & Executive Board Spokesman

- 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 25
Years with Knorr-Bremse 2



Dr. Claudia MayfeldMember 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

Notes: RVS - Rail Vehicle Systems; CVS - Commercial Vehicle Systems



Bernd SpiesMember of the Board, CVS

- 2022-present: Knorr-Bremse | Head of CVS
- 2014-2022: Knorr-Bremse | Member (2013-2015) and Chairman (since 2014) of the Management Board, CVS
- 2008-2013: Hella KGaA Hueck & Co:| Member of the Management Board, Global Sales
- 2006-2008: Robert Bosch GmbH | Head of Commercial Vehicles product division, Starters and Alternators
- Diploma in Electrical Engineering

Professional Experience

Years with Knorr-Bremse

8

28



Dr. Jürgen WilderMember 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

Years with Knorr-Bremse

4

Knorr-Bremse - One of Germany's most successful industrial companies



KNORR-BREMSE



Family-Ownership, heritage and unique DNA



Global market leader for braking systems



Shared pneumatics experience between RVS and CVS



Technology leadership

2021 Key financials

Sales € 6.7bn (>9% CAGR¹) 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 PORTFOLIO²⁾...



RVS 59% (22% Margin)



... AND DIVERSIFIED GLOBAL FOOTPRINT WITH HIGH LOCAL CONTENT



Europe/Africa 46%



30+ 1 countries



100+ sites



c. 30k employees³⁾

Notes: Sales, EBITDA, EBITA, 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

Over 30 years of consistent strong growth



BOSCH

1985

1985

Management buyout by Mr. Thiele



2000

Bendix integrates Westinghouse Air Brake company



2015/18

Joint Venture with DonaFena Motor goes into operation & expansion 2018



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.



2021

Acquisition of EVAC

1985-1990

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



2002

100% acquisition of Bendix in the US



2015/16

7 acquisitions



2017/18

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



2020

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



2021

Investment in Autobrains

1999

Dawn of the ICE era with high-speed braking systems

Rise of ADB technology

Joint Venture with Bosch in Electronics

1990

1995

2000

2002

Sales (€bn) ● Important corporate events ● Product innovation ● M&A / Strategic partnerships

2003

2005

1989



2006

4 Joint Ventures in Rail formed in China



2016

New state-of-the-art innovation and testing



centre in Munich

2010

€ 6.7bn >9% sales CAGR 1985¹⁾-2021 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 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 share1 in RVS brakes
- ~23% market share¹ in CVS brakes



Market outperformance

Track record of above industry growth: 10% historic revenue CAGR²



Innovation edge

Shaping industry trends by focusing on safety and mission critical applications



Sustainability is part of our DNA

Our technologies are the foundation for sustainable and safe transportation



Profitability

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

end markets



Resilience

36% aftermarket share1 Well-balanced portfolio **Cost-efficient** operations



High safety requirements

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



Global #1 – Leading supplier of safety-critical rail and commercial vehicle systems

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

Brake systems Entrance systems

HVAC1)

Train Control Management Systems

LRV2) traction systems



Power electrics

Auxiliary power supply

Signaling systems

Modernisation and support

Modernisation and support

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

Fuel efficiency

- Engine components
- Transmission

Brake systems, steering & vehicle dynamics

- Brake control
- Automated driving
- Brake systems
- Steering systems



Energy supply & distribution

Connectivity

Electrification

Aftermarket services including Alltrucks network3)

ALLT QUCKS

Our customers

Example car builders

ALSTOM.



SIEMENS STADLER



Example operators

















PACCAR







TR/\TON









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

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

One of only two suppliers able to offer harmonised products globally

Continuously increasing safety and emission standards requirements

CVS

KB has maintained and expanded its market leading positions



Market positions key product groups¹



Brake systems

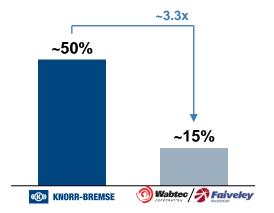


Entrance systems



HVAC systems²

Global brakes market shares¹



Example global market leader for brakes¹



Market positions key product groups³



Brake systems & vehicle dynamics⁴

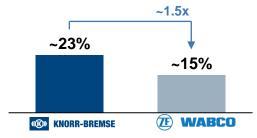


Energy supply & distribution⁵



Fuel efficiency⁶

Global brakes market shares³



Example global market leader for brake systems & vehicle dynamics⁴

^{1) 2020} estimates for OE and aftersales 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

Different economic cycles

- ~50/50 split RVS and CVS (by sales)
- Different market drivers
 - short vs. long cycle
 - private vs. public investment

High aftermarket share

- ~36% total sales¹)
 - 46% of RVS sales¹⁾
 - 27% of CVS sales¹⁾
- Large installed base



Diversified customer base

Partner to all major local and global players

Global footprint and local content

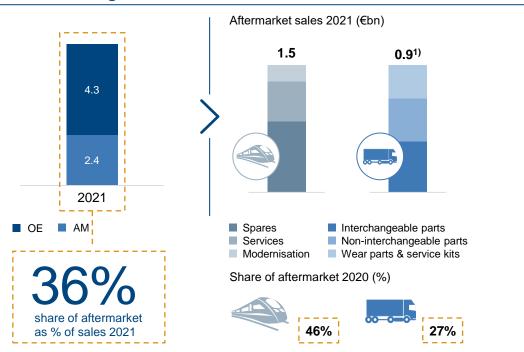
- High level of local content in manufacturing, purchasing and R&D
- Presence in 30+ countries with 100+ sites
- ~80% of employees outside Germany
- ~15% of employees in **China**, catering to local market

Notes: 1) Based on IFRS in 2020



Resilience – Attractive aftermarket business with comprehensive service offering drives profitability and contains high future potential

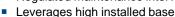
Aftermarket is the growth and resilience backbone



Key features

Annuity-like





20-30 years long relationships

Close to the customer

- RVS
 - 36 service centres²⁾
 - 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



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
- ADAS¹) / HAD²) 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)

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



Pioneering innovations (examples)

RVS



Digital automatic coupler for freight (DAC)



CVS

Electric power steering



Reproducible braking distance



Electronic parking brake



LIFEDrive sliding doors



eCompressor

Long-term R&D ratio: 6 – 7 %

15

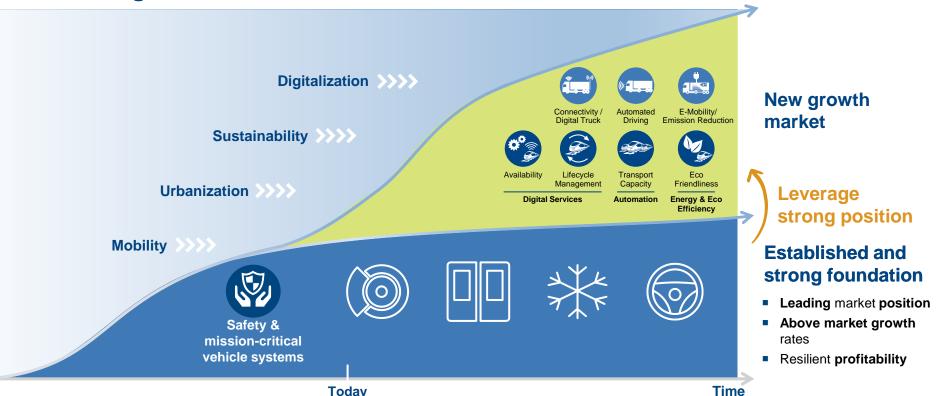
We confirm our successful strategy

- ((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



KB continues to systematically develop its portfolio of mission critical products and digital solutions

Mechanical products

Mechatronic products

Smart & digital products

Strong basis —





Pneumatic brake system







Electronically controlled pneumatic brake







Smart brake control (Cube Control)









Build new business in RVS



Digital Services



Availability

Automation



Transport Capacity

Energy & Eco Efficiency



Eco Friendliness

Applications (examples)

Industry trends

> Condition-based/ predictive maintenance

Aftermarket

Lifecycle

Management

Automation

Energy savings / metering

RVS solutions (examples)

European train operator use case

RAILNOVA.

HVAC monitoring & energy saving

Investment into Railnova



RailServices portfolio for optimized LCC1





Increased train density



Environment sensing



Driver advisory system



Smart metering

2) Reproducible Braking Distance 1) Lifecycle costs



19

Build new business in CVS



Industry

trends





Energy & Eco Efficiency



Connectivity/ Digital Truck



Automated Driving



E-Mobility/ Emission Reduction

Applications (examples)

Driver safety management

ADAS

HAD actuation & motion control

Electrification

CVS solutions (examples)



Collecting safety data and video for coaching & evaluation



ADAS offering with strong partners



Combining steering, braking, and motion control



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

Solution Examples Condition Monitoring

Remotely monitor condition of KB products

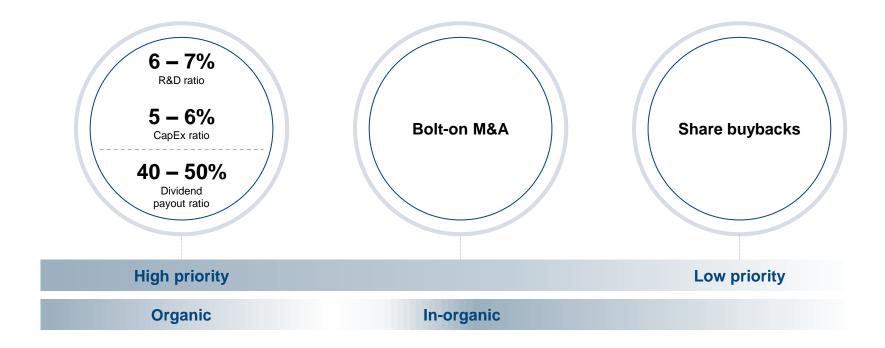
Digital business models

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



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

Markets & Segments

- Highly attractive growth segments with strong entry barriers
- Technological differentiation

Business Model

- Leading market position and/or leading technology
- Sustainable competitive advantage
- Resilient business model

Synergies

- Best owner principle
- Tangible and realistic synergies
- Easy to integrate with high cultural fit

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

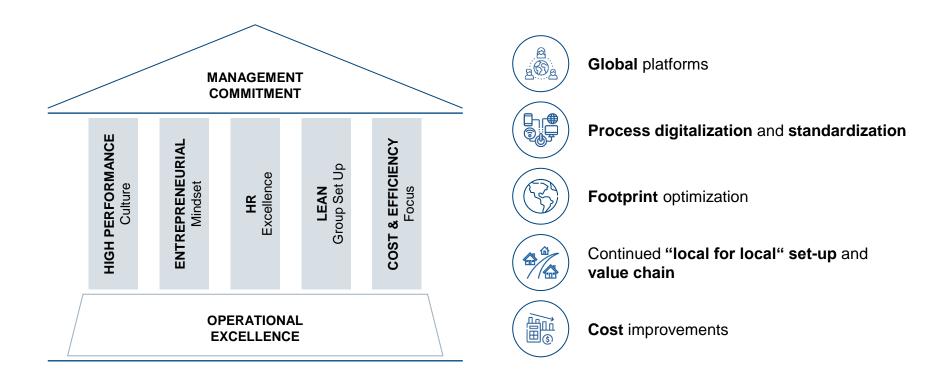
Asset-light business model

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

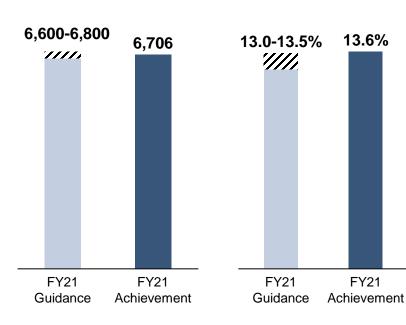


FY21: Guidance achieved in a challenging environment

Revenue

op. EBIT margin

€m





Outperformance in major markets

Resilient profitability

Strong cash preservation during Covid

Corporate Governance improvements

Shareholder value generation



Stronger growth than markets

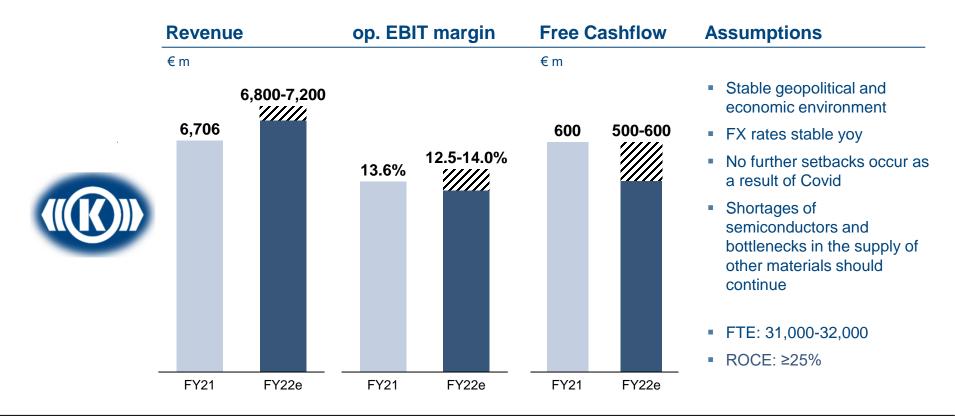
op. EBIT margin of 13.6%

FCF of € 600m and CCR of 92%

ESG target in STI included and reporting shortened

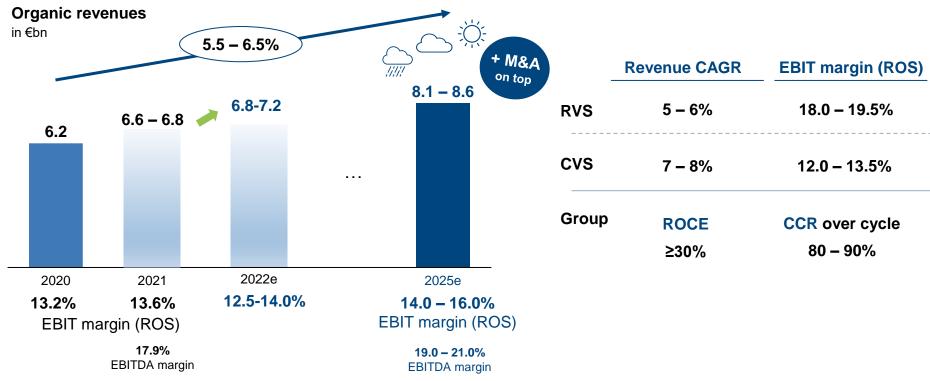
EPS at 3.87 and ROCE 25.0%

Group Guidance 2022 fully in line to support our mid-term targets





Mid-term outlook: continued profitable growth of Knorr-Bremse towards 2025



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



Strong growth profile



Technology innovation

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

RVS with long track record of outperforming underlying markets

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



High barriers to entry



Resilience



Profitability

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

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

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 share 1)



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)



by channel

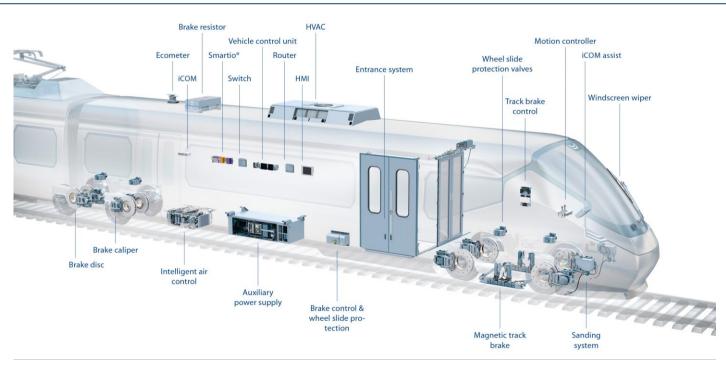


Notes: BilRUG sales allocated proportionally between OE and aftermarket; 1) RVS market share estimates for OE and aftersales without labour; 2) All active rail vehicles without freight cars with a minimum of one Knorr-Bremse system related to brakes, entrance systems and HVAC installed; 3) Total reported 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



Deep dive into RVS braking technologies of Knorr-Bremse

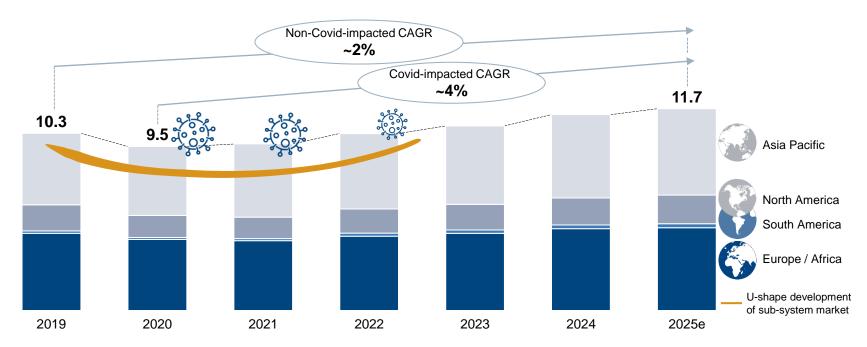
Key elements of a braking system in RVS



Long-term growth in global rail will continue, despite Covid U-shape

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





1) Big Five - Brakes, Doors, HVAC, Power Electrics, TCMS; Source: Knorr-Bremse information and internal market research

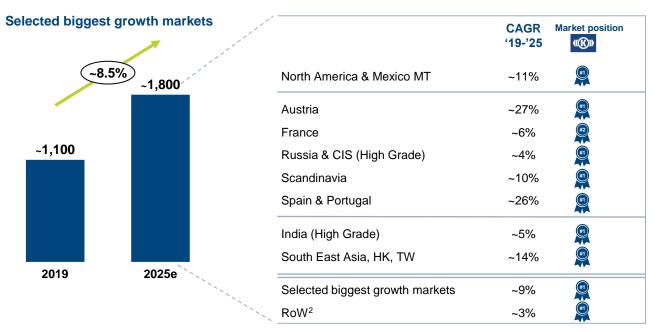


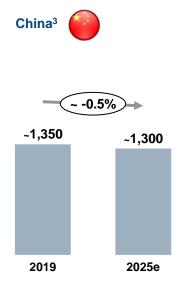
Future growth will come from markets in Europe, Asia and North America



Market development OE

in €m, CAGR in %1







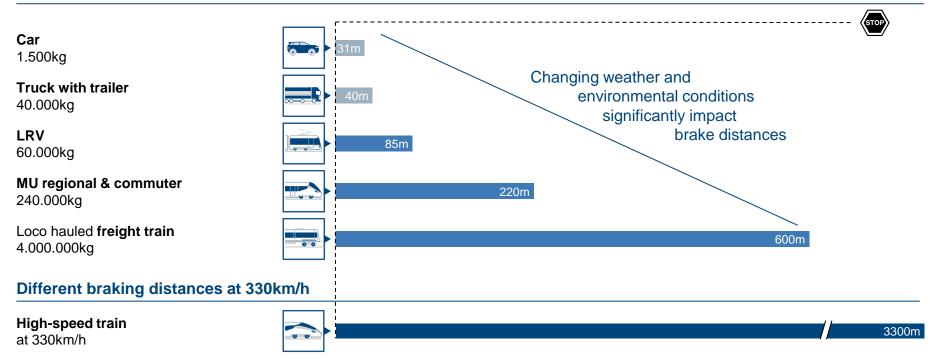
¹⁾ Brakes, Doors, HVAC, rounded to the nearest 50 2) Rest of World w/o selected biggest growth markets & w/o China Source: KB internal market research; Values recognize FX rates

³⁾ High Grade only, w/o conventional market

The enormous brake distances in Rail require outstanding braking performance



Different braking distances at 80km/h

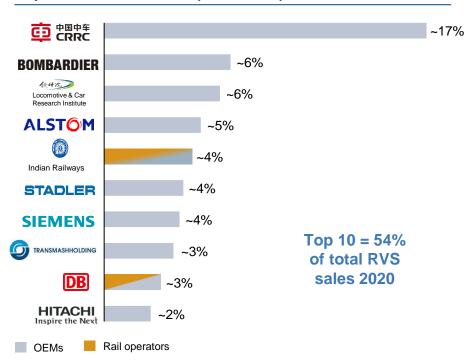




Global Tier-1 partner of choice for OEMs and rail operators in all regions



Top 10 customers 2020 (% of sales)



Other major Knorr-Bremse customers

>>300 Relevant rail operator customers



K⊜R∧IL

bhpbilliton

>50 Relevant OEM customers

中国铁路总公司 CHINA RAILWAY

会上海世铁 Shanghai Metro



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



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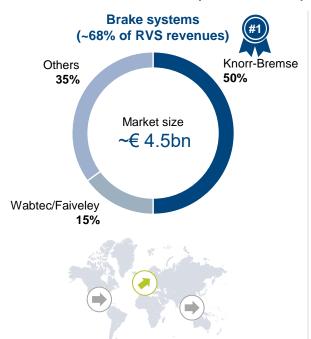
MTR

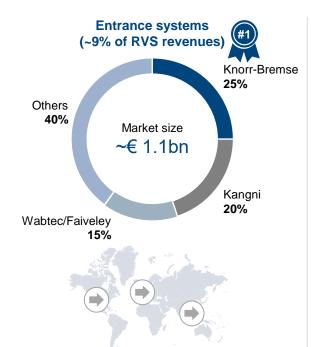
UGL

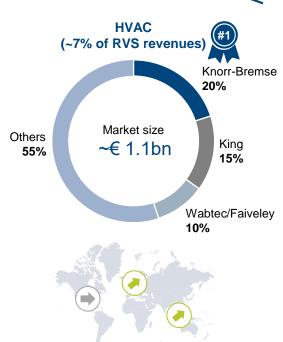
RVS holds global #1 position across key product categories



Global market share 2020¹ (% of revenues)







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



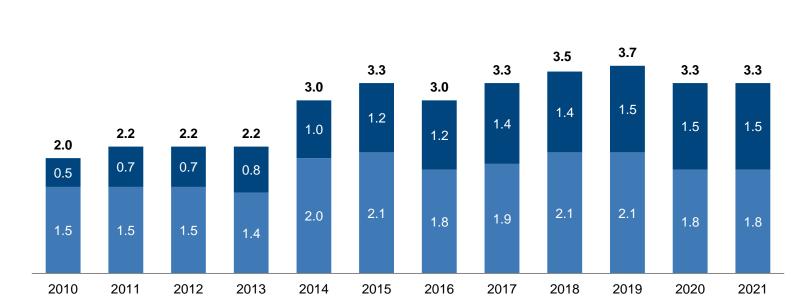
Historic development of OE and AM business



Strong growth both in OE and AM

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





4.6% AM

Total

10.2%

OE 1.7%

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



RVS grew within each business unit, despite Covid impact, AM outperformed

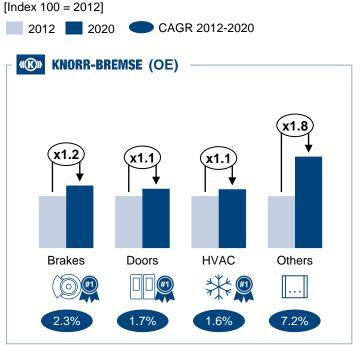


Revenue development

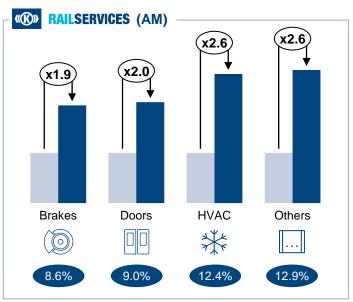
in €bn











... drives the profitable Aftermarket



Aftermarket business will continue to be an important growth engine

Revenue split 2021 in €bn OE AM 54% 3.3 46% Long-term goal

> 45%



Opportunities



Use installed fleet



Modernization



New service models & digital solutions



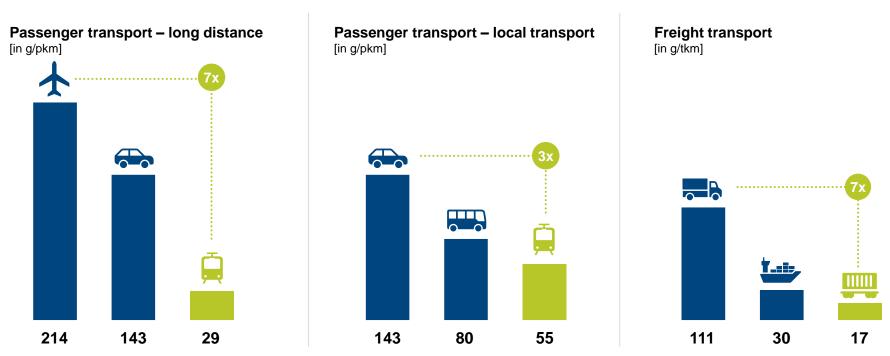
Challenges

- Competition by OEMs, focussing more on service
- Insourcing and lifecycle costs optimization, incl. stretching overhaul cycles

CO₂ emission targets not achievable in transportation without rail



Greenhouse gas emissions from transport¹



1) 2019, reference for Germany, Sources: 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



Market protected by unique level of complexity ...

Major global standards	4
Unique configurations for vehicle types	7
Brake subsystems	3
Safety-critical components	>100
Country- and customer-specific variants	Multiple
100k active brakes articles to homologate	

... and long homologation time for each component

Standard ¹⁾		Typical time-to-market		
	Key regions	Development (yrs) ²⁾	Certification (yrs) ²⁾	
ųíc)		A	4	
C GOST		A	4 3	
ASSOCIATION OF AMERICAN RAILROADS	7	∱ [3]	4 1	
AUSTRALASIAN RAILWAY • ASSOCIATION	**	∱ [3]	4 1	

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



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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



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)



Other major Knorr-Bremse customers

































>30

>90

>30

>90

>20

>5

>5

>30

>90

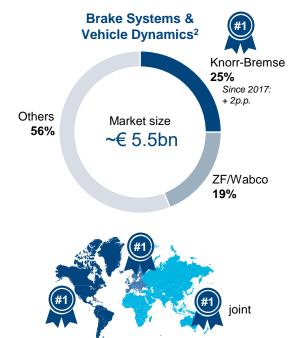
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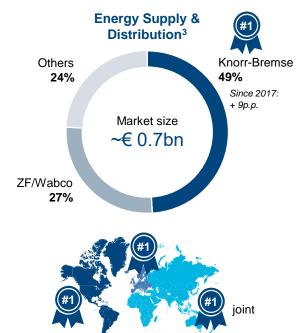
1) Share of top 10 customers as % RVS sales 2020 may not add up due to rounding

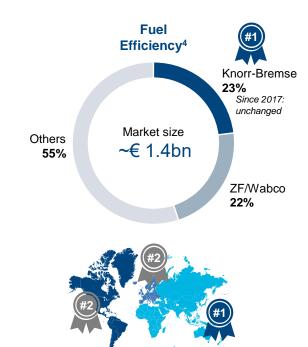


CVS is market leader in all major product fields

Global market share 2021¹ (% of revenues)







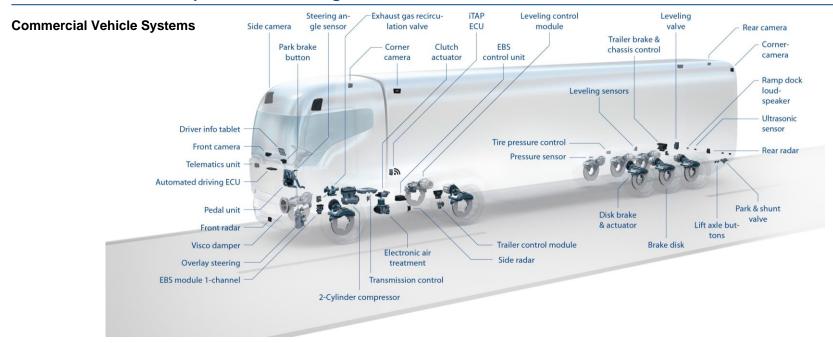
1) 2021 estimated addressable Truck, Bus and Trailer OE market, incl. "Brake Systems & Vehicle Dynamics (incl. Automated Driving)", "Energy Supply & Distribution" and "Fuel Efficiency"; excl. aftermarket; Knorr-Bremse data 2) Air Disc Brake, Valves / Pedal Unit, Actuators, Foundation Drum Brake, Steering, ABS, EBS, ESP, DAS, ELC; incl. segment Others 3) Compressors, Air Treatment 4) Vibration Dampers, Engine Air Control, Transmission – Gear and clutch actuation



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



Knorr-Bremse CVS comprehensive offering

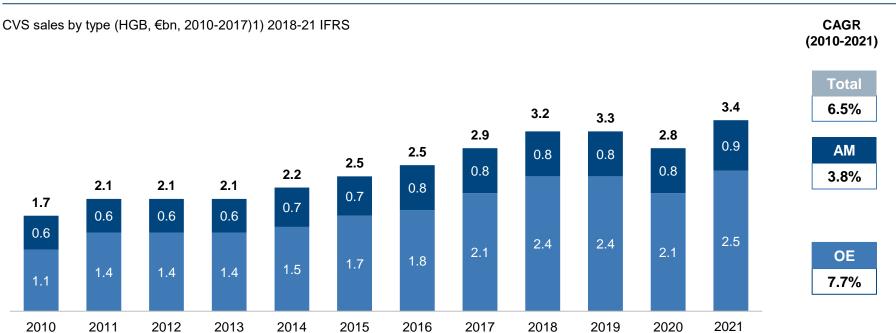




Historic development of OE and AM business



Strong growth both in OE and AM

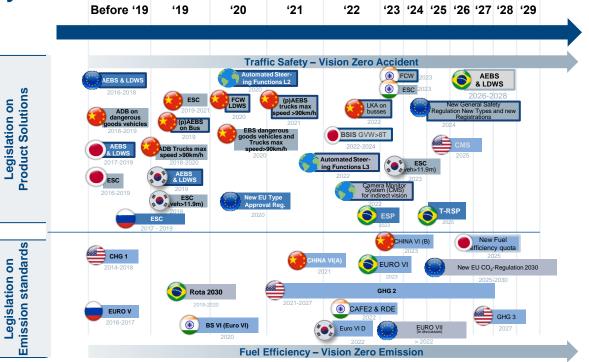


Notes: ; Some sales split may not add up due to rounding 1) BilRUG sales allocated proportionally between OE and aftermarket; 2) Global Truck and Bus market excluding aftermarket and Trailer; Source: Knorr-Bremse information and internal market research; IHS for truck production rate



Conversion in legislation drives the global adoption of technologies provided

by Knorr-Bremse











Legislative decisions foster demand for Knorr-Bremse solutions

Emission standards Traffic and safety Automated Driving Expected/in discussion

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**

Truck production CAGR	Glo Mid-term until mid-20s	bal ¹ Long-term until 2030	North Al Mid-term until mid-20s	merica ² Long-term until 2030	Mid-term until mid-20s	pe ³ Long-term until 2030	Mid-term until mid-20s	ina Long-term until 2030
Growth in KB CPV	0%	0%	-1%	0%	+2%	+1%	-2%	-2%
with traffic safety solutions	~ +4%	•	<4%		<4%	•	>4%	•
Growth in KB CPV focus on technologies for automated driving, e-mobility & connectivity								

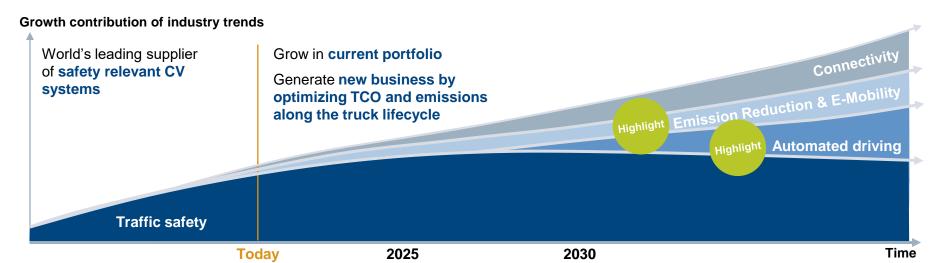
1) Incl. Turkey & Korea 2) Class 6 – 8 3) West & East Europe



New growth areas for CVS



Illustrative growth potential



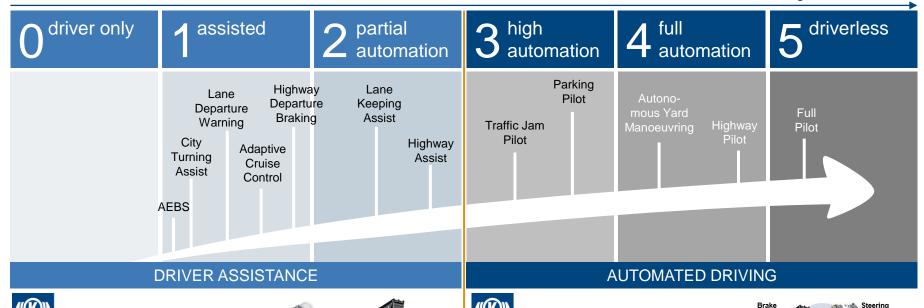
Current CVS portfolio with focus on traffic safety perfectly fits market demands

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



degree of automation



Brake

Control

Steering

Air Disc

Brake

KNORR-BREMSE

CVS as a

system

supplier

Braking

Steering

Sensors

Level 1 and 2 functions

CV system competence

Braking

Steering

Vehicle dynamics

Related redundancy

CVS as vehicle dynamics •

supplier in consortium/

partnership approach

Vehicle

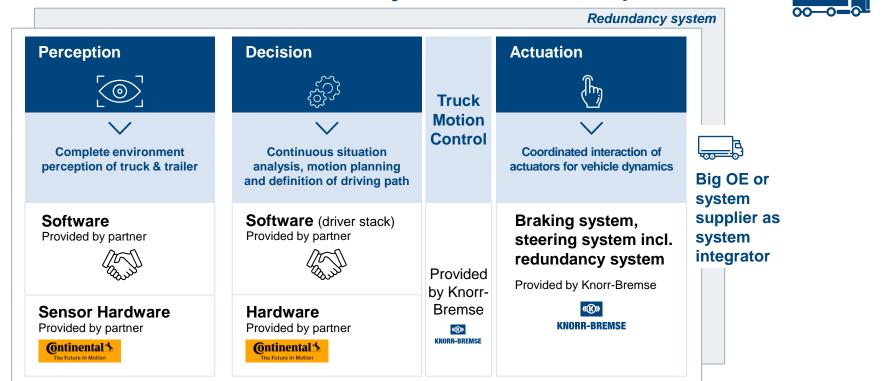
Control

dynamics /

Truck Motion

53

CVS offers automated driving solutions in a partnership approach - Actuation, Truck Motion Control and Redundancy are CVS' core competencies



Knorr-Bremse teams up with Continental to become a leading Automated **Driving system supplier for commercial vehicles**

Ontinental

KNORR-BREMSE

- 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



Redundancy



Consumer Benefits

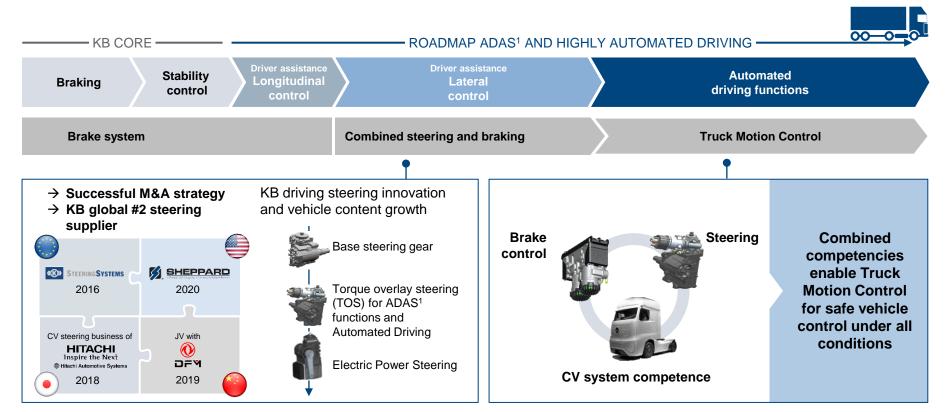
- Industry benchmark perception decision and actuation from the one source
- Superior performance through full-system approach
- Cost-optimized systems for commercial vehicles

Joint Project Scope

- Development of systems, components and functionality for Automated Drivina
- Validation and release of complete highly Automated Driving systems
- Collaboration in joint project house



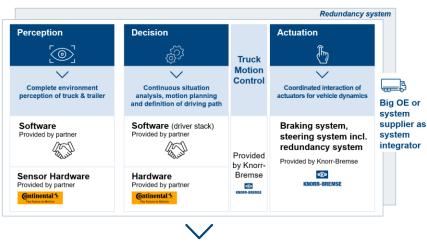
Truck Motion Control combines braking, steering and vehicle dynamics



1) ADAS = Advanced Driver Assistance Systems



Different offerings for automated driving in a partnership approach





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

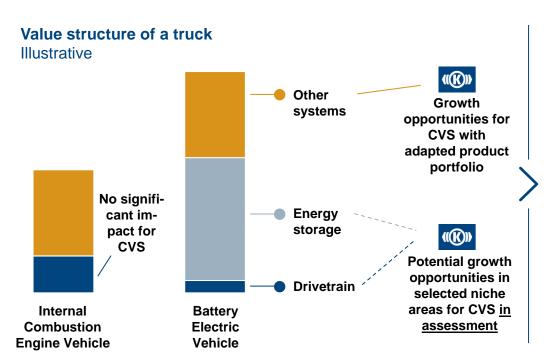


CVS fosters system competency and future content per vehicle increase potential

- General requirement for redundant Flectric/Flectronics 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

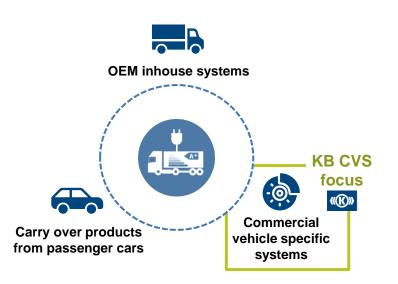
- Shift from ICE to EV vehicles offers first mover advantage
- More complex Electrics/Electronics architecture in electric vehicles increases content per vehicle
- KB products in "other systems" and in energy storage offer growth potential for CVS
- Value reduction in drivetrain does not affect CVS significantly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

58

CVS founded an internal incubation unit for e-mobility solutions



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



Internal incubation unit set up for solutions for emobility



- 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



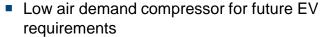
New EV product fields



eCompressor









Redundant power management system



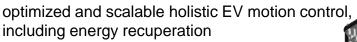


EV brake resistor





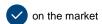
EV brake control & vehicle dynamics

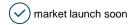




Opportunities in fuel cell electric vehicles in assessment











in assessment



Internationalisation: Global growth strategy focuses on North America penetration as well as Chinese and Indian market share expansion



Exploit leading position



Leverage local presence



Expand market share









- 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

- 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

- 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

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R&D is at the very core of Knorr-Bremse's DNA

With over 12,000 patents¹⁾

Knorr-Bremse secures the future innovation roadmap. Largest patent portfolio in the industry²⁾

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

Focused & disciplined approach ensuring highest efficiency

Significant synergies between RVS and CVS

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;

...resulting in synergies and cross-proliferation

Cross-divisional R&D examples





Technology transfer for ADB from RVS to CVS



1992 Air Disc Brake



1985 Screw Compressor



RVS Screw Compressor technology adopted for CVS applications



2011 Screw Compressor



2021/2022 Collision Avoidance



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



2008 Collision Avoidance



Faster time-to-market



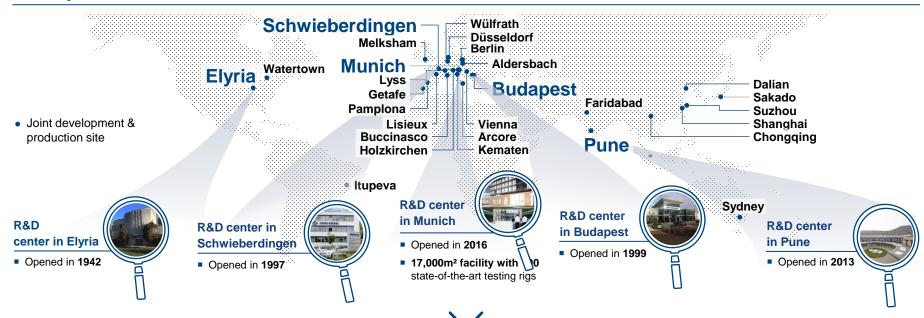
·· Higher cost benefit



Focused customer solutions

Leveraging Knorr-Bremse's synergies & partnerships: centres of excellence as basis for sustained technology leadership

Globally $\Sigma \sim 3.600 \text{ FTE}^{-1}$



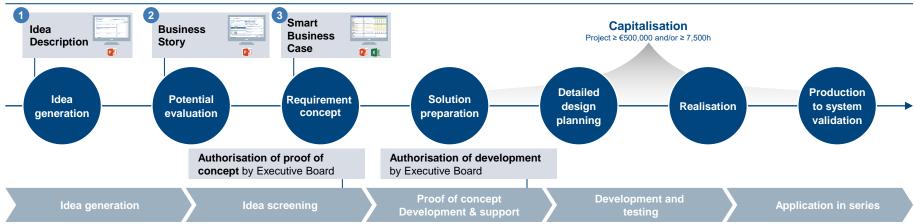
Knorr-Bremse's innovations are supported by a network of specialized development centres with joint production and R&D

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...

- (5) Optimisation of TCO1)
- Reduction of energy consumption, noise, weight
- Safety & reliability
- Connectivity, wireless solutions, ethernet
- Adaption to regulation

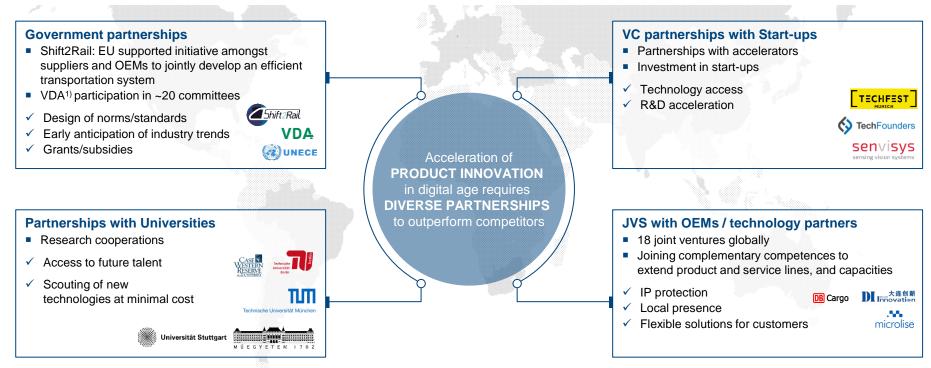
...and maximum economic benefit for Knorr-Bremse

- All projects assessed based on NPV²
- Prioritisation of projects according to IRR3)
- 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



Close co-operation with customers & strategic partners



Countries Knorr-Bremse is present

Notes: 1) VDA - Verband der Automobilindustrie (German Association of the Automotive Industry)

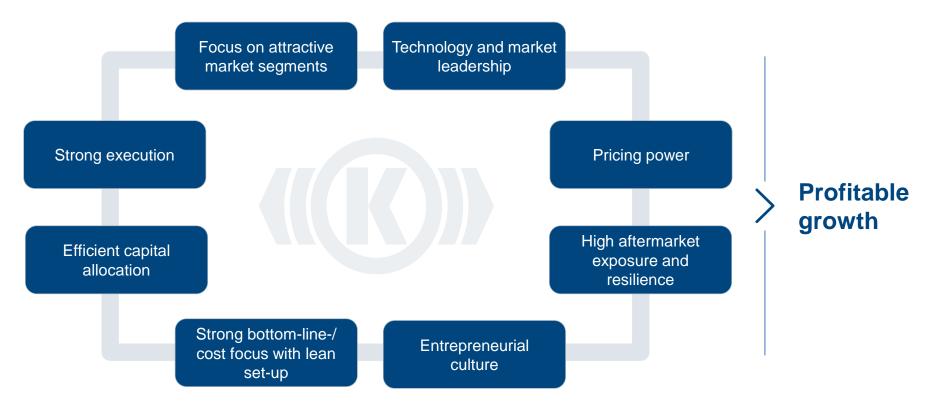


Agenda

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

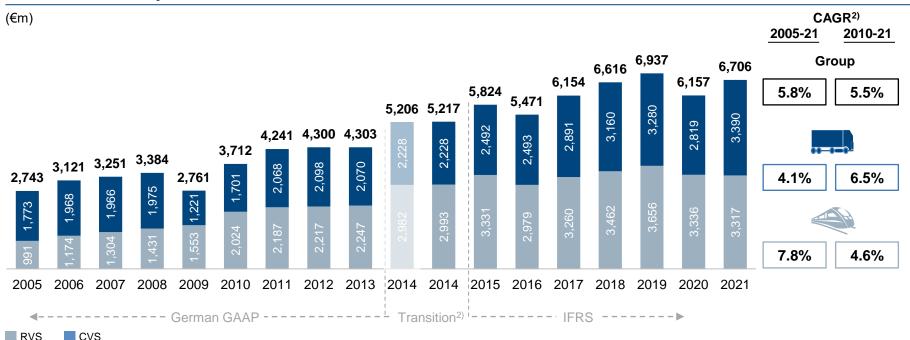


Financial excellence foundation: success factors for future profitable growth fully intact



Track record of strong and sustainable top-line growth ...

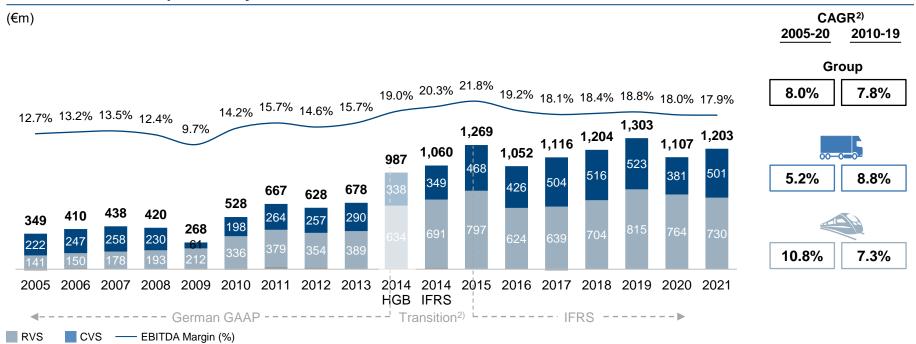
Historical sales¹⁾²⁾ by division



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 EBITDA¹⁾²⁾ profitability



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

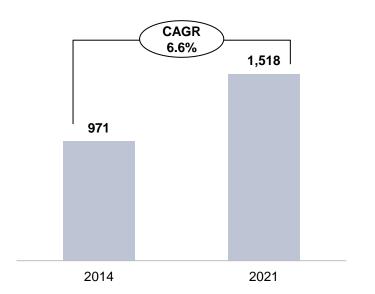
RVS – Aftermarket sales¹⁾



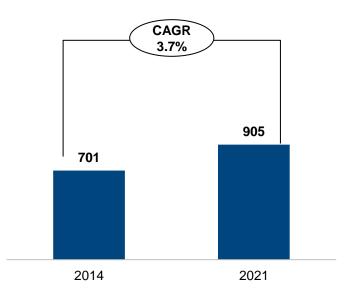
CVS - Aftermarket sales¹⁾



(€m)



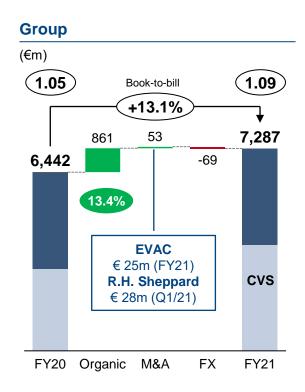
(€m)

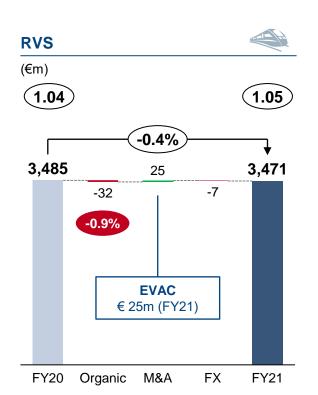


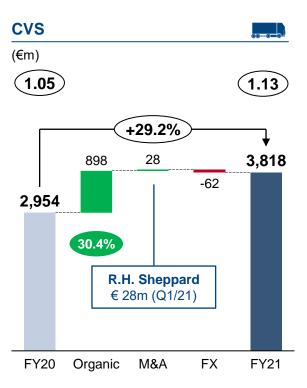
Notes: 1) Based on IFRS; BilRUG sales allocated proportionally between OE and aftermarket



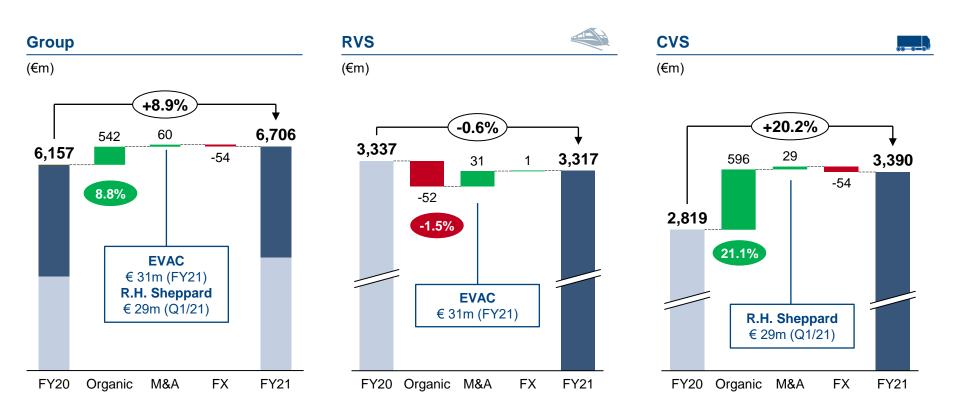
FY21: Order Intake for Group, RVS & CVS



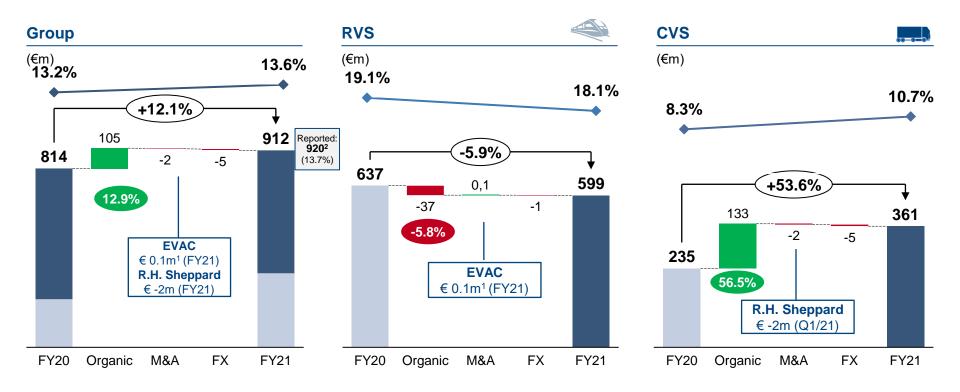




FY21: Revenue for Group, RVS & CVS



FY21: op. EBIT for Group, RVS & CVS



Agenda

- Introduction
- Key Company Highlights
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- Financials
- Sustainability
- Capital Markets Summary
- Appendix



The basis of our responsibility

Our values

Growing with Values.











- Entrepreneurship
- Technological Excellence
- Reliability
- Passion
- Responsibility

UN Global Compact









- Human rights
- Labor standards
- Environmental protection
- Anti-corruption

CR Policy





- Comprises our understanding of Corporate Responsibility
- Sets down guidelines for our CR focus areas
- Points out the main focus of our efforts to realize social and environmental 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.

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.

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**.

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 YE2021

Carbon neutrality from 2021

- Climate strategy with ambitious targets
 - 50% CO₂ emission reduction by 2030
 - Carbon-neutrality at KB sites from YE21
- 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

Future objectives 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) Diversity Safety at work Social projects Puture objectives Inprove gender balance in global works or gender balance in global workforce and mgmt. Workplace accidents <1 per 200,000 hours worked 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

New KPI in mgmt. compensation system as of 1.1.22 (20% STI weight)

RATINGS:

Current: top 25 percentile



Goal: at least top 25 percentile























Knorr-Bremse takes active part in corporate memberships throughout the world



United Nations Global Compact (participation since 2010)



APTA - American Public Transportation Association, USA



UNIFE - Sustainable Transport Committee of the Union des Industries Ferroviaires Européennes, BEL



AAR - Association of American Railroads, USA



VDA - Verband der Automobilindustrie e. V., GER Working Groups: Sustainable supply chain & products



AIAG - Automotive Industry Action Group, USA



Railsponsible – founding member (sustainable rail supply chain initiative)



MEMA - Motor & Equipment Manufacturers Association, USA



VDB - Fachgruppe Umwelt im Verband der Bahnindustrie e. V., GER



New York and New Jersey Minority Supplier Development Council, USA



APRA - Automotive Parts Remanufacturers Association - Chairman Europe

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)



Agenda

- Introduction
- Key Company Highlights
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- Financials
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- Capital Markets Summary
- Appendix

Share data

Share data

Type of share	Bearer shares with no-par value	
Bloomberg ticker	KBX	
Reuters ticker	KBX.DE	
German security identification number (WKN)	KBX100	
ISIN	DE000KBX1006	
Shares outstanding as at December 31, 2018	161.200.000	

Bond Data

The Corporate Bonds of Knorr-Bremse AG

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

Strong current rating: S&P (A) and Moody's (A2)



Agenda

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

Glossary (1/2)

%	Percentage	CF	Cash flow	ELC	Electronic leveling control
ABS	Anti-lock brake system	CFO	Chief Financial Officer	EOP	End of period
ACC	Adaptive Cruise Control	CKR	Czech Koruna	ESP	Electronic stability program
AD	Automated Driving	CNY	Chinese Yuan	EU	Europe, European Union
ADAS	Advanced driver assistance systems	cvs	Commercial Vehicle Systems	EUR	Euro
ADB	Air Disk Brake	D&A	Depreciation & Amortization	FTE	Full-time equivalent
AEBS	Advanced Emergency Braking System	DE	Germany	GAAP	Generally Accepted Accounting Principles
AG	Aktiengesellschaft (German: Stock Corporation)	Dol	Date of Implementation	GBP	British Pound
AM	Aftermarket	е	Expected	GDP	Gross domestic product
BDM	Brake Distance Management	EAC	Electronic Air Control	GSBC	Global Scalable Brake Control
bn	billion	EBIT	Earnings before Interest, Tax	HQ	Headquarters
CAGR	Compound Annual Growth Rate	EBITDA	Earnings before Interest, Tax, Depreciation, Amortization	HSR	High-speed rail
CAPEX	Capital expense	EBS	Electronic brake system	HU	Hungary
CEO	Chief Executive Officer	EGR	Exhaust Gas Reduction	HUF	Hungarian Forint



Glossary (2/2)

HVAC	Heating, ventilation & air conditioning	LDW	Lane Departure Warning	тсо	Total cost of ownership
IAA	International Automobil-Ausstellung (German: International Motor Show)	m	million	TPR	Truck Production Rate
IAM	Independent Aftermarket	M&A	Merger & acquisitions	UIC	International union of railways
iCOM	Intelligent Condition-Oriented Maintenance	OEM, OE	Original equipment manufacturer	US	United States
IFRS	International Financial Reporting Standards	OES	Original equipment service	USD	US Dollars
IN	India	OPEX	Operating expense	WC	Working Capital
loT	Internet of Things	p.a.	per annum		
IPO	Initial Public Offering	PWM	Private Wealth Management		
JV	Joint venture	R&D	Research & Development		
КВ	Knorr-Bremse	ROE	Return on Equity		
KB2020	Knorr-Bremse 2020	ROS	Return on Sales		
KPI	Key Performance Indicator	RVS	Rail Vehicle Systems		
LCC	Life-cycle cost	TCMS	Train Control Management System		



Disclaimer

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