



**IR Presentation** 

March 2019

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## The Knorr-Bremse leadership team



**Klaus Deller** CEO

- 2009-present: Knorr-Bremse CEO, previously Head of RVS (3 years) and Head of CVS (6 years)
- 2004-2009: Brose Fahrzeugteile Deputy CEO
- 1991-2003: Robert Bosch Executive Vice President
- Diploma in Mechanical Engineering, Applied Mathematics, Master of **Business Administration (MBA)**



**Ralph Heuwing** CFO

- 2017-present: Knorr-Bremse CFO
- 2007-2017: Dürr (MDAX listed) CFO
- 1990-2007: The Boston **Consulting Group** Partner and Managing Director
- Diploma in Mechanical Engineering, Master of **Business Administration (MBA)**

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Dr. Peter Laier Head of CVS

- 2016-present: Knorr-Bremse Head of CVS
- 2014-2015: Benteler International C00
- 2013-2014: Osram Licht CTO
- 2000-2012: Continental Executive Vice President
- PhD and Diploma in Mechanical Engineering

**Professional** Years with Experience **Knorr-Bremse** 

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Dr. Jürgen Wilder Head of RVS

- 2018-present: Knorr-Bremse Head of RVS
- 2015-2017: DB Cargo AG CEO
- 2013-2015: Siemens AG Mainline Transportation Global Business Unit CEO
- 2011-2013: Siemens AG Head of Strategy Infrastructure and Cities Sector

Years with

**Knorr-Bremse** 

Doctorate in Physics

Professional

**Experience** 

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Professional Years with Experience

**Knorr-Bremse** 

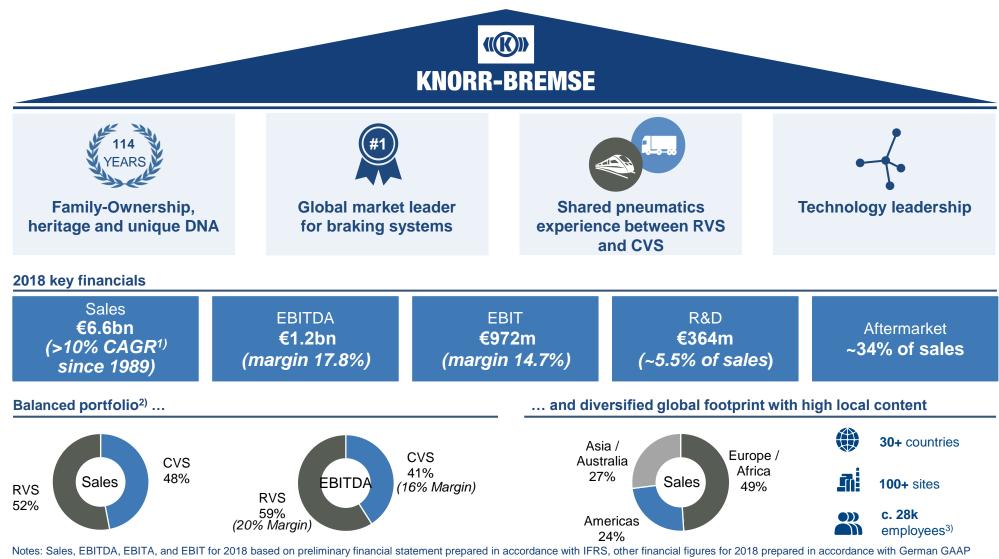
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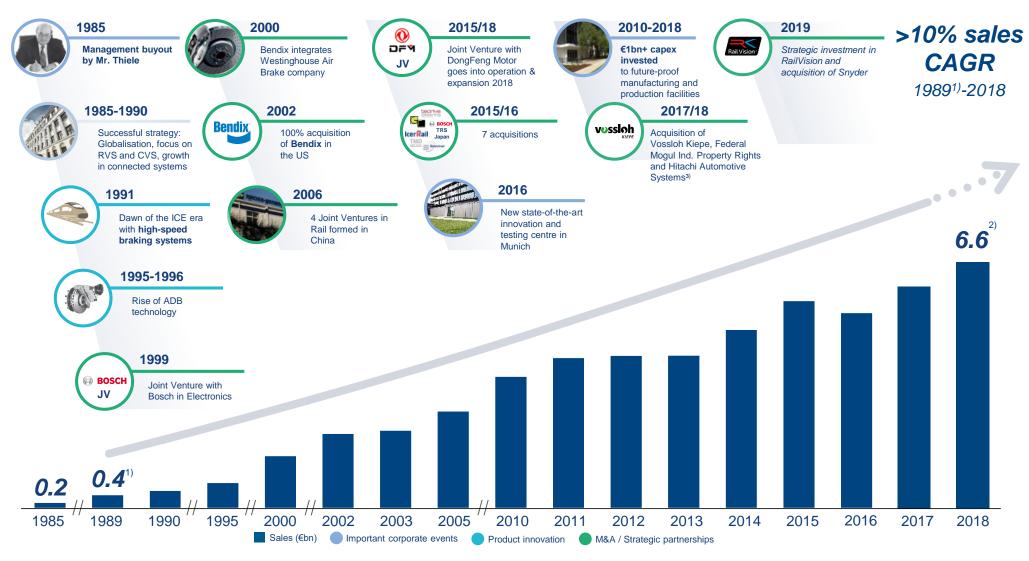
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## Knorr-Bremse – One of Germany's most successful industrial companies



(HGB); Aftermarket share based on German GAAP (HGB) where BilRUG sales allocated proportionally between OE and aftermarket; RVS – Rail Vehicle Systems; CVS – Commercial Vehicle Systems; <sup>1)</sup> CAGR 1989–2018 based on German GAAP (HGB), 1989 – first year when consolidated accounts are available; <sup>2)</sup> Excluding consolidation/other; <sup>3)</sup> Including human resources leased staff; *Source: Knorr-Bremse information* 

# Over 30 years of consistent strong growth



Notes: 1986-2018 based on financial statements prepared in accordance with German GAAP (HGB) and 2017 and 2018 based on financial statements prepared in accordance with IFRS. <sup>1)</sup> 1989 – first year when consolidated accounts are available; <sup>2)</sup> Preliminary sales for full 2018; *Source: Knorr-Bremse information*; <sup>3)</sup> Closing end of March 2019 expected

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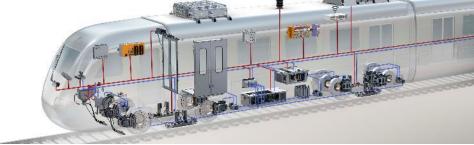
1 Global #1	Number one supplier for braking systems and a leading supplier of other safety critical rail and commercial vehicle systems protected by high barriers to entry
2 Synergistic business	Technology and scale benefits between rail and commercial vehicles
3 Market outperformance	Consistent outperformance of attractive end-markets driven by megatrends and increasing content per vehicle
4 The industry innovator	Driving innovation in mobility and transportation technologies through R&D, quality excellence and edge in connected systems
5 Resilience	Resilient business model, supported by broad geographical and customer diversification, high aftermarket exposure and strong localisation
6 Superior financial profile	Strong growth, profitability, and cash generation with high earnings visibility
7 Leadership excellence	Highly experienced management team with strong track record and clear vision for future value creation



# Global #1 – The world's leading supplier of safety critical rail and commercial vehicle systems

### LRV<sup>2)</sup> Train Control Entrance Brake HVAC<sup>1)</sup> Management traction systems systems Systems systems

RVS offering (2018: 52% of sales, 59% of EBITDA)



### Power Auxiliary Signaling systems power supply electrics Modernisation and support Aftermarket services

### Preferred partner for all major OEMs<sup>4</sup>) and operators across the globe



Notes: 2018 financials based on IFRS excluding consolidation/other; <sup>1)</sup> HVAC – Heating, ventilation and air conditioning; <sup>2)</sup> LRV – Light rail vehicle; <sup>3)</sup> 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; <sup>4)</sup> OEM – Original Equipment Manufacturer; Source: Knorr-Bremse information



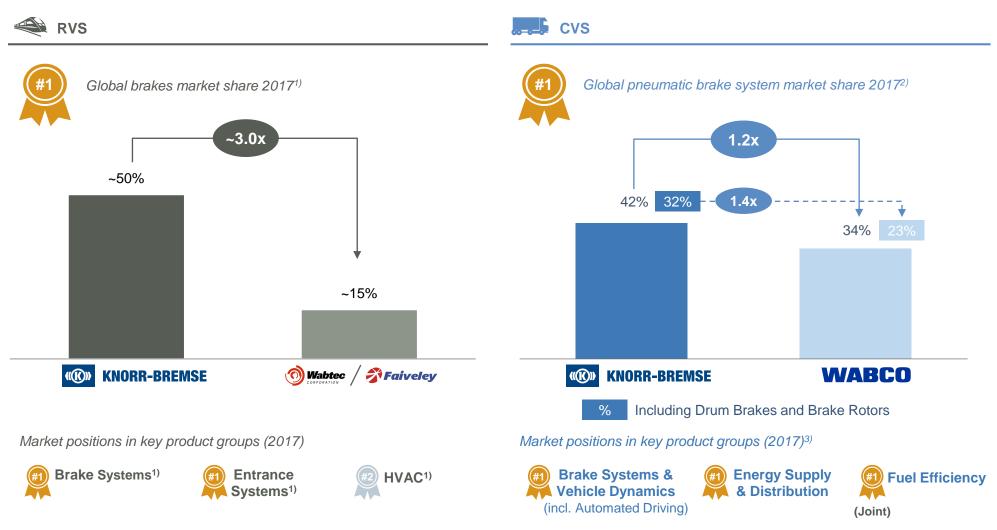
### CVS offering (2018: 48% of sales, 41% of EBITDA)

Fuel efficiency	Brake systems & vehicle dynamics		
<ul> <li>Engine components</li> </ul>			
<ul> <li>Transmission</li> </ul>	<ul> <li>Brake systems</li> <li>Steering systems</li> </ul>		



Energy supply & distribution	Connectivity	Electrification		
Aftermarket services including Alltrucks network <sup>3)</sup>				

Global #1 – Number one supplier for braking systems and a leading supplier of other safety critical rail and commercial vehicle systems ...



Notes: <sup>1)</sup> 2017 RVS market share estimates for OE and aftersales without labour; Wabtec includes Faiveley; For the competitor an estimate was used; Market shares rounded to the nearest multiple of 5%; <sup>2)</sup> 2017 Market share estimates for Truck and Bus OEM sales only including Air Disc Brake, Brake Control and Air Supply (excluding Drum Brakes and Brake Rotors; Drum Brakes are mainly produced by the OEMs and Brake Rotors are mainly sourced separately), excluding aftermarket and Trailer; Knorr-Bremse data based on market intelligence and experts estimate in 2017; <sup>3)</sup> For 2017 global addressable Truck, Bus and Trailer OE, excluding aftermarket; *Source: Knorr-Bremse information and internal market research* 



# (1) 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
- $\checkmark\,$  High initial capital requirements, highly protected IP landscape and economies of scale
- ✓ Highest quality and safety requirements
- $\checkmark\,$  Long lifecycle with resulting customer loyalty, long gestation period for aftermarket

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

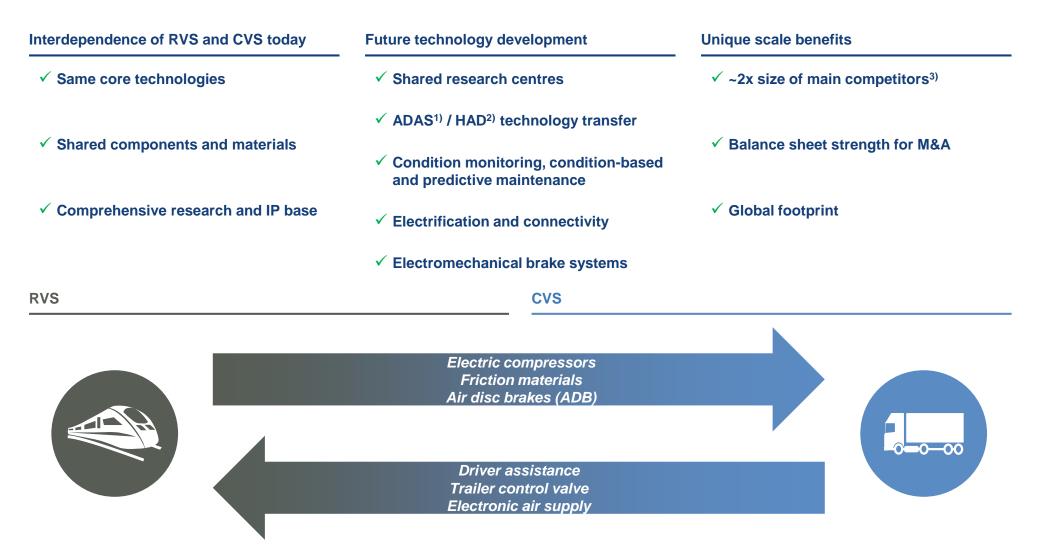
### Market specifics

RVS	<b>Only supplier worldwide</b> certified for all global and local standards and norms (GOST, UIC, AAR, ARA)
L	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	<b>One of only two suppliers</b> able to offer harmonised products globally
	<b>Continuously increasing</b> safety and emission standards requirements

Source: Knorr-Bremse information



# 2 Synergistic business – Technology and scale benefits between Rail and Commercial Vehicles



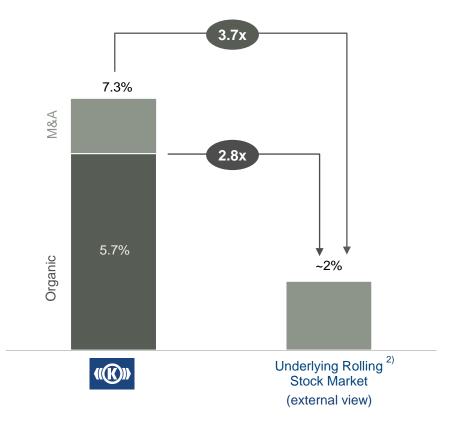
Notes: <sup>1)</sup> ADAS – Advanced driver assistance system; <sup>2)</sup> HAD – Highly automated driving; <sup>3)</sup> Based on 2017 sales and status quo pre-Wabtec merger with GE Transportation; 2017 €/USD FX: 0.83346 used as of 31 December 2017; Source: Knorr-Bremse information; WABCO and Wabtec / Faiveley information based on Annual Report 2017

3 Market outperformance – Knorr-Bremse is well positioned to deliver continued growth above rail industry levels



### Knorr-Bremse with strong track record of industry outperformance

CAGR (2010-2017) RVS sales<sup>1)</sup> (HGB) and market



### Key future growth drivers

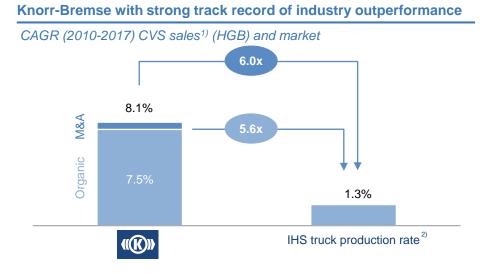
Asia G	rowth	Outsourcing	
<ul> <li>Chinese high-speed</li> <li>Mass urban transport in APAC</li> <li>Expansion and upgrade of Indian rail rolling stock</li> <li>CRRC international expansion</li> </ul>		<ul> <li>Outsourcing from rail OEM's (trend towards de-verticalisation)</li> </ul>	
Digitisation		Aftermarket	
Increasing demand for connected systems and other digital solutions		<ul> <li>Global rail services and aftermarker for rolling stock</li> </ul>	
$\checkmark$	Certification capability for all	global core markets	
	Partner of many Chinese OE	Ms and large installed base	
V		Leading control and monitoring technology	
v √	Leading control and monitori	ng technology	

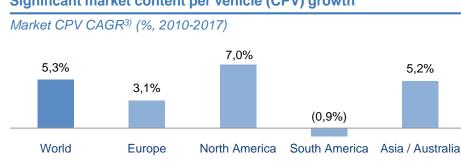
Notes: <sup>1)</sup> Based on German GAAP (HGB); <sup>2)</sup> Underlying OE rolling stock and aftermarket volume as defined by Roland Berger (July 2018). Market CAGR based on 2010 to 2016 market volumes; Source: Knorr-Bremse information, Roland Berger - Analysis of rail vehicle market report (July 2018) for growth rate of underlying rolling stock market



Market outperformance – Strong growth in content per vehicle expected to result in continued outperformance of global commercial vehicle market







### Significant market content per vehicle (CPV) growth

### Key future growth drivers

Megatrends and conversion of regulatory standards Global megatrends provide attractive growth opportunities Convergence of regulatory standards drives global adoption of technologies Disc brakes replacing drum brakes Market share gains **Content increase** Traffic Safety Product upgrading Fuel efficiency Regional expansion strategy Market leader in a consolidated industry with only 2 global players

- A strong technology innovator shaping the industry

Multiple trends driving growth independent of underlying market dynamics

Ideally positioned to win in market defining trend towards ADAS/HAD<sup>4)</sup>

Notes: 1) Based on German GAAP (HGB); 2) Global Truck and Bus market excluding aftermarket and Trailer; 3) Addressable Truck, Bus and Trailer OE market for "Brake Systems & Vehicle Dynamics (incl. Automated Driving)", "Energy Supply & Distribution" and "Fuel Efficiency"; 4) Advanced Driver Assistance Systems/Highly Automated Driving; Source: Knorr-Bremse information; IHS for truck production rate

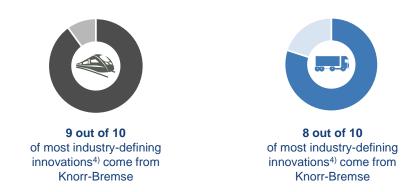


# 4 The industry innovator – Driving innovation in mobility and transportation technologies through R&D leadership and edge in connected systems

### Knorr-Bremse invests more in R&D<sup>1</sup> 2018 IFRS 2017 German GAAP 5.5% 6.2% 2.5% 5.2% 4.4% 365 207 152 123 79 ((K))) **Wabtec**<sup>2)</sup> (K)) **((K)**)) WABCO **KNORR-BREMSE** RVS CVS 2017 R&D as % of sales 2018 R&D as % of sales

### Knorr-Bremse has a larger patent portfolio than its peers

### Consistently pioneering "first to market" innovations...

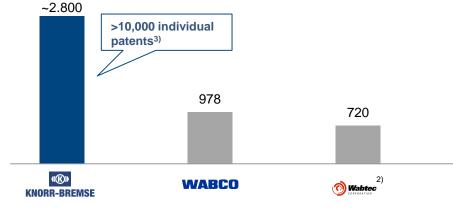


### ... supported by focused M&A and partnerships



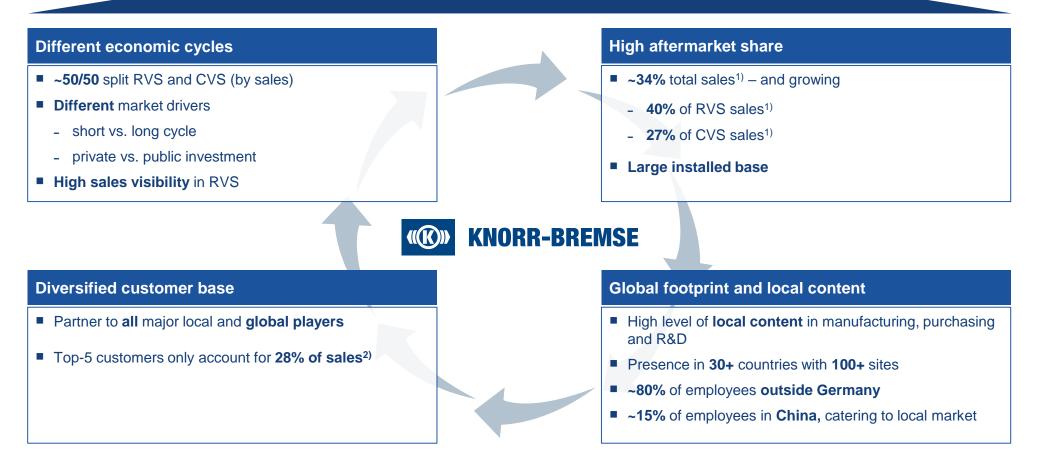
# Notes: €/USD conversion 0.83; <sup>1)</sup> Knorr-Bremse R&D financial information based on 2018 IFRS & 2017 German GAAP (HGB), R&D ratio as reported in annual reports; <sup>2)</sup> PF Faiveley and excl. GE Transportation acquisition; <sup>3)</sup> Granted and applied patents; <sup>4)</sup> Information as per Knorr-Bremse management view; Industry defining are considered to be the top 10 innovations in the past 30 years in the rail and commercial vehicle industry; *Source: Knorr-Bremse information; 2017 annual reports of Wabtec / Faiveley and WABCO; PatentSight*

Portfolio size based on patent families (public)



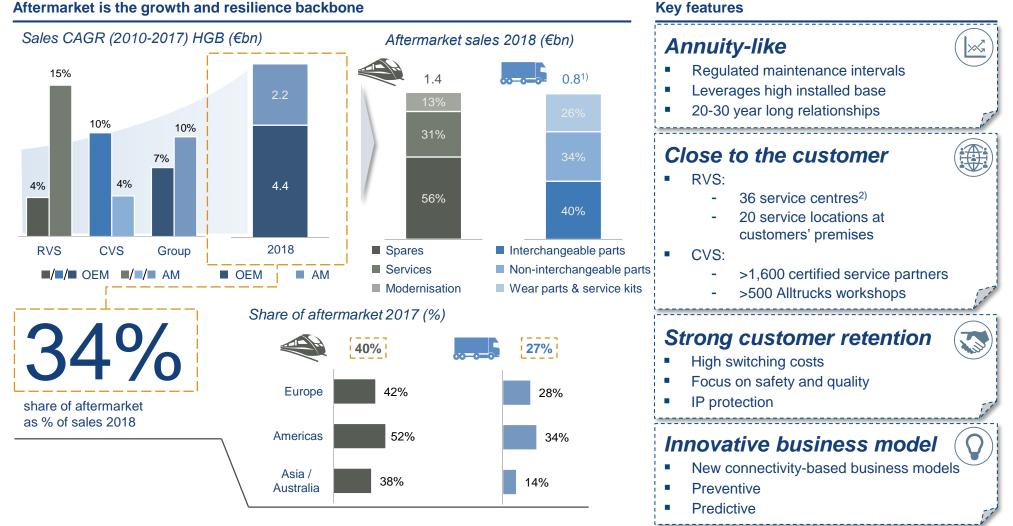
5 Resilience – Business model supported by high aftermarket exposure, broad geographical and customer diversification and strong localisation





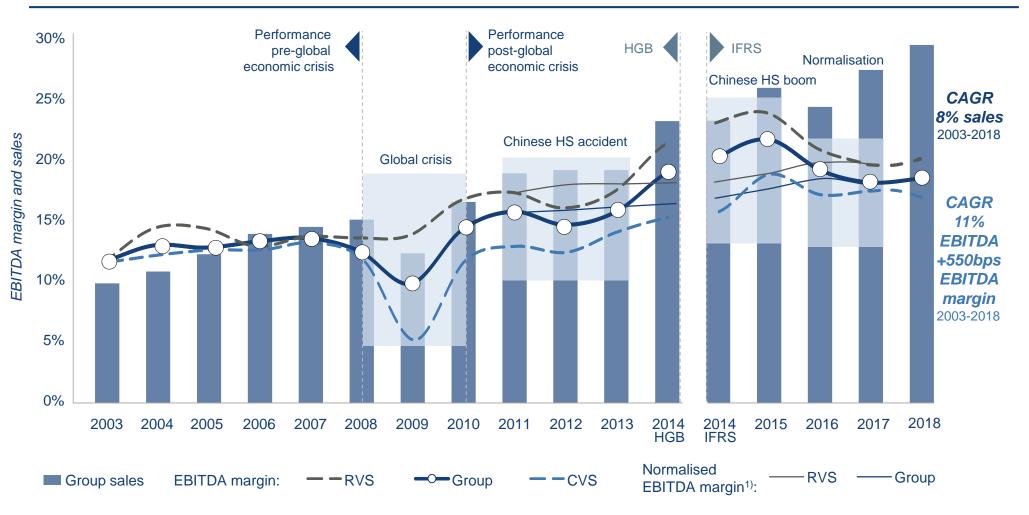
Notes: <sup>1)</sup> Based on prelim. German GAAP (HGB) for 2018; BilRUG sales allocated proportionally between OE and aftermarket; <sup>2)</sup> Based on German GAAP (HGB) for 2017; Source: Knorr-Bremse information

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



Notes: Based on prelim. German GAAP (HGB); BilRUG sales allocated proportionally between OE and aftermarket; <sup>1</sup> Total CVS aftermarket sales and independent aftermarket sales EMEA (excl. South Africa & Skach) as proxy for the global split; <sup>2</sup> Does not include service locations at customers' premises; *Source: Knorr-Bremse information* 

### Strong track record of resilient and profitable growth



Notes: Financials based on German GAAP (HGB) prior to 2014 and IFRS 2014-2018; Data presented in accordance with German GAAP (HGB) may not be comparable to data prepared in accordance with IFRS; <sup>1</sup>) Normalised margin estimate for China accident impact and recovery; Estimate based on Knorr-Bremse assumptions; *Source: Knorr-Bremse information* 

# Leadership excellence – Clear vision for future value creation

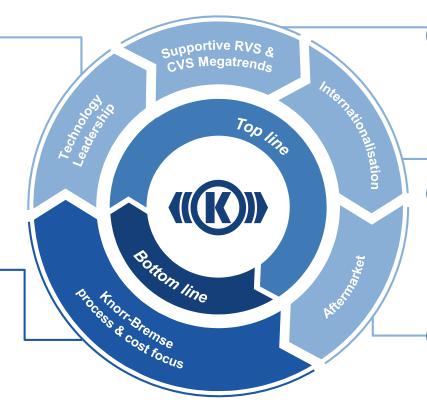
### **Expand technology** leadership position

- Growth potential from new technologies
- Introduction of ADAS<sup>1</sup>, HAD<sup>2</sup> and connected systems
- Focus on digitisation and connectivity
- Significant profitability improvement in non-braking technology products

### **Continued cost focus**

- Set of initiatives to drive up the margins
- Global supply chain & unified purchasing
- Global process standards (KPS)<sup>3)</sup>
- Permanent cost discipline
- PMI in newly acquired companies
- Operating leverage

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### **Capture opportunities** from megatrends

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- RVS as natural outsourcing partner for OEMs
- Win in RVS de-regulated markets
- Continued market outperformance in CVS through ADAS, connectivity and e-mobility
- Megatrends drive continued content growth

### **Drive internationalisation strategy**

- Leverage profitable mass urban transport opportunities, in particular in China and India
- Benefit from Belt and Road Initiative (BRI)
- Increase exposure to high margin countries

### Grow profitable aftermarket

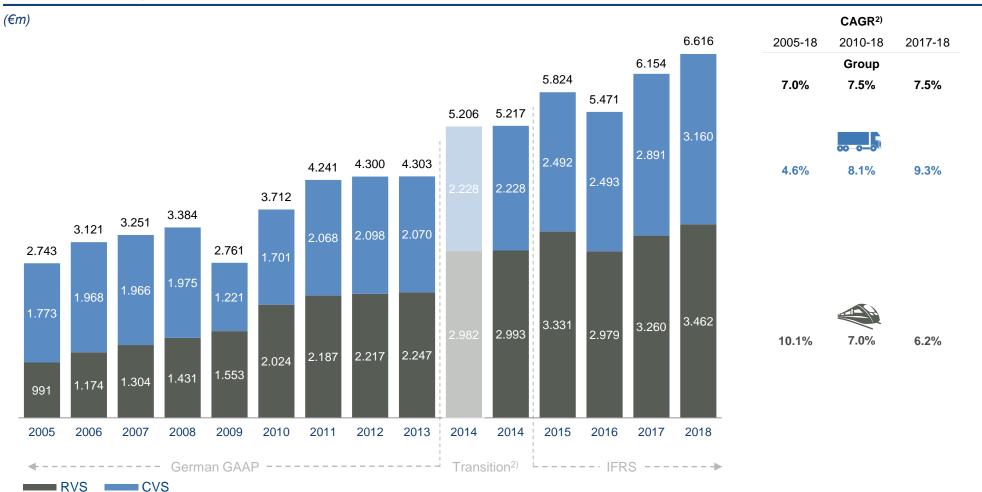
- Leverage large installed base
- Apply new business models (digital & data based)
- Close to customer



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

Historical sales<sup>1)2)</sup> by division

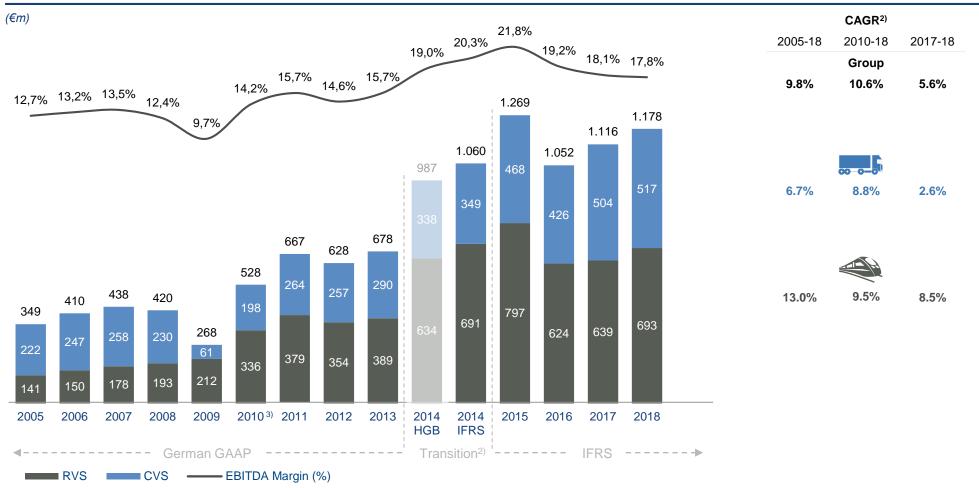


Notes: <sup>1)</sup> Divisional historic figures do not add up to group sales excluding consolidations/other; <sup>2)</sup> 2014 represents the first year that Knorr-Bremse prepared its financial statements in accordance with IFRS. Prior to 2014, financial statements were only prepared in accordance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

((K)) Knorr-Bremse Group

# ... combined with disproportionate EBITDA growth

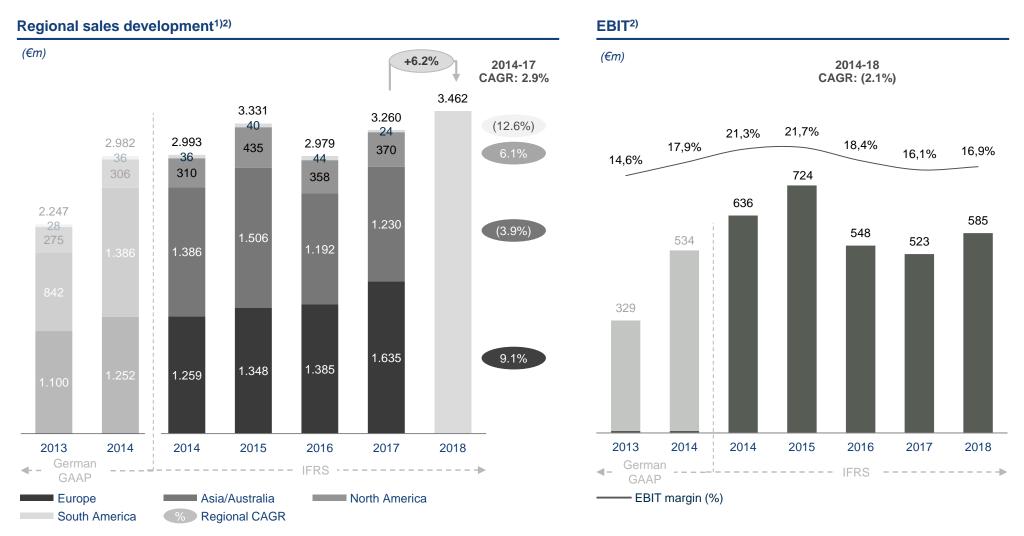
### Historical EBITDA<sup>1)2)</sup> profitability



Notes: <sup>1)</sup> Divisional historic figures do not add up to group EBITDA excluding consolidations/other; <sup>2)</sup> 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; <sup>3)</sup> EBITDA 2010 including extraordinary expenses due to BilMOG; *Source: Knorr-Bremse information* 

# **RVS – Sales development driven primarily by Europe and China with profitability reflecting regional margin mix dynamics**

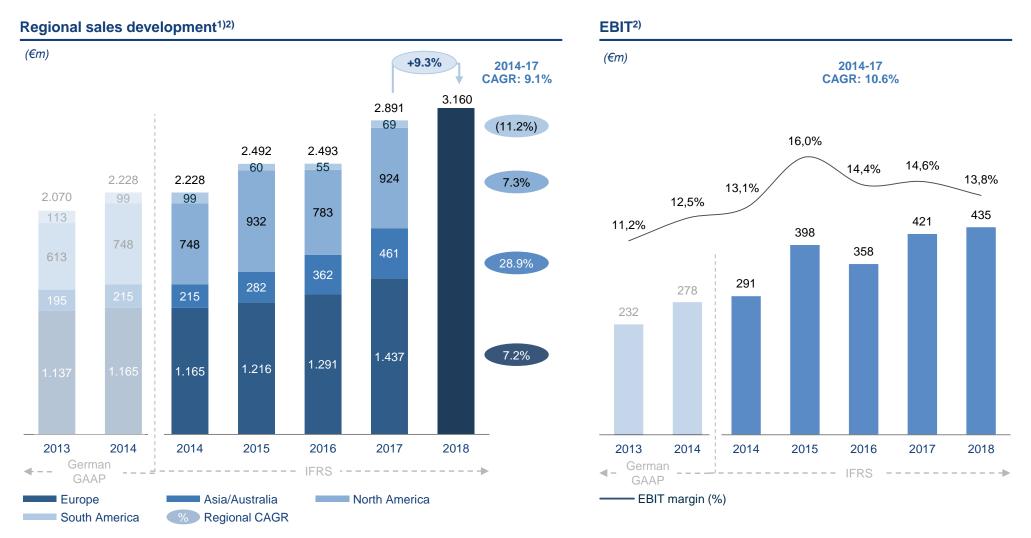




Notes: <sup>1)</sup> 3<sup>rd</sup> party historic regional sales figures do not add up to divisional sales excluding IC sales; <sup>2)</sup> 2014 represents the first year that Knorr-Bremse prepared its financial statements in accordance with IFRS. Prior to 2014, financial statements were only prepared 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* 

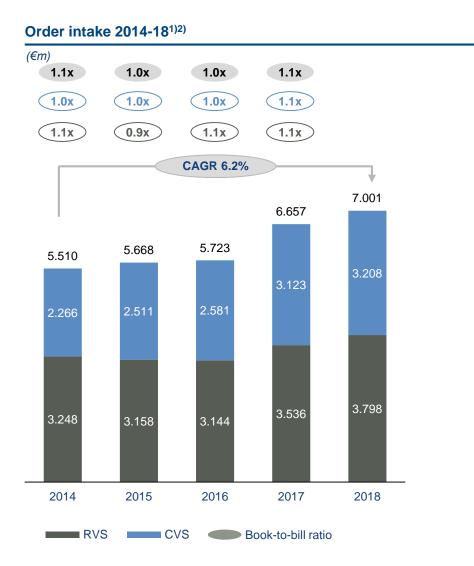
# CVS – Sales growth driven by strong momentum across key regions coupled with significant margin expansion

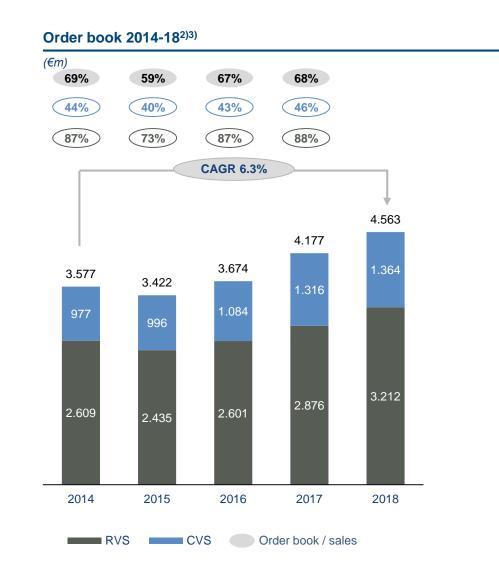




Notes: <sup>1)</sup> 3<sup>rd</sup> party historic regional sales figures do not add up to divisional sales excluding IC sales; <sup>2)</sup> 2014 represents the first year that Knorr-Bremse prepared its financial statements in accordance with IFRS. Prior to 2014, financial statements were only prepared 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* 

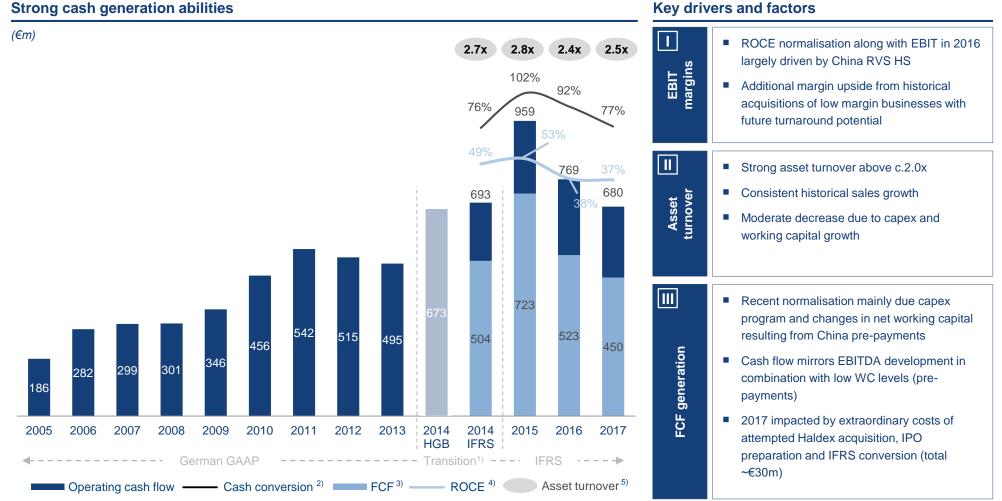
# Top-line visibility supported by high order intake and order book





Notes: 1) Non-GAAP metric; 2) Group figures include consolidations/other; 3) Calculated based on financial statements prepared in accordance with IFRS; Source: Knorr-Bremse information

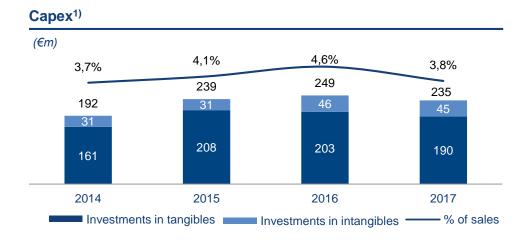
# **Knorr-Bremse is a high return and cash generative business**

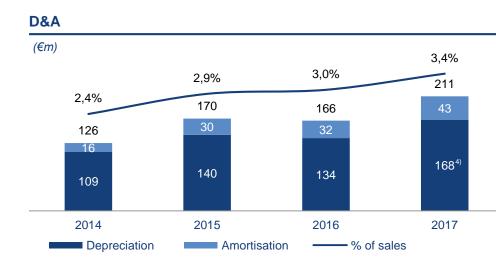


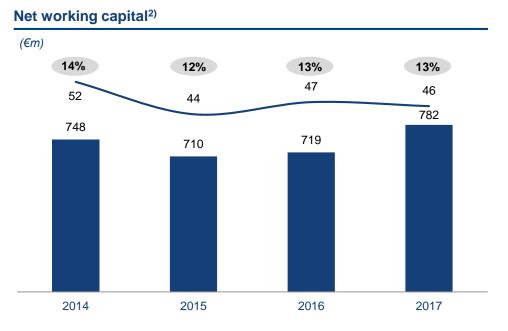
Key drivers and factors

Notes: 1) 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; <sup>2)</sup> Cash conversion defined as: (OCF - investments in fixed assets - investments in intangible assets) / net income; <sup>3)</sup> FCF (Free Cash Flow) defined as cash flow from operations minus cash-relevant capex; <sup>4)</sup> ROCE defined as EBIT divided by capital employed (Fixed assets + Intangible assets + Net working capital); <sup>5)</sup> Asset turnover defined as sales divided by capital employed; Source: Knorr-Bremse information

# Fully invested asset base driving low capex requirements







Increase in D&A in 2017 mainly due to the difference in fair value and the proceeds from sale of assets held for sale resulting in additional €25m impairment

Effect from step-ups<sup>3)</sup> included in amortisation are €9m in 2017, €8m in 2016 & 2015 and €1m in 2014

Net working capital

------ Net working capital days

NWC in % of sales

Notes: Based on financial statements prepared in accordance with IFRS; <sup>1</sup>) As per asset register, defined as investments in fixed and intangible assets incl. finance leasing; <sup>2</sup>) Net working capital defined as Inventory + Accounts receivables + Construction contracts with positive balances - Accounts payables - Construction contracts with negative balances - Prepayments received; <sup>3</sup>) Step-ups from key PPA's (Selectron, Powertech, GT & Kiepe Electric); <sup>4</sup>) Including €25m from impairment of assets held for sale; *Source: Knorr-Bremse information* 

		2019 guidance
P&L	Revenue	<ul> <li>Group: 6,800 – 7,000 mEUR (+3.8% – 6.9% after eliminating disposals)</li> <li>Assuming constant currencies, organic growth only, already considering disposals</li> <li>Unchanged economic &amp; political environment</li> </ul>
	EBITDA Margin	<ul> <li>18.0% – 19.0%</li> <li>On track with medium term margin expansion by +150 bps until 2021/2022 (acc. prospectus)</li> <li>Assuming no structural changes</li> </ul>

- Strong order book provides good visibility for 2019
- RVS growth broad-based across all markets and segments
- CVS continued outperformance through increasing content per vehicle
- Margin expansion from elimination of 2017/18 one-offs, stringent profit improvement measures and AM initiatives
- Continued strong focus on cash generation

Full guidance, including divisional targets, to be disclosed with annual report end of April



		Medium-term guidance
P&L	Revenue	<ul> <li>Group organic CAGR of c. 4.5%-5.5%</li> <li>➢ RVS c. 5-6%</li> <li>➢ CVS c. 4-5%</li> <li>Assuming constant currencies</li> </ul>
	EBITDA Margin	<ul> <li>Margin expansion c. 150 bps compared to 2017</li> <li>&gt; Driven by both divisions</li> <li>&gt; RVS division slightly ahead vis-à-vis CVS division</li> </ul>
Cash flow	Capex	<ul> <li>Capex ratio in line with 2014–2017 average</li> <li>&gt; RVS: c. 4% of revenue</li> <li>&gt; CVS: c. 4% of revenue</li> </ul>
	Working capital	<ul> <li>DWC requirements expected to be in line with 2014-2017 average</li> </ul>
Capital	Leverage	<ul> <li>Maintain solid investment grade</li> <li>Target leverage &lt;1x Net debt/EBITDA, incl. post financing of acquisitions</li> </ul>
structure	Dividend	<ul> <li>Target payout ratio of 40–50% of IFRS net income</li> </ul>
Other	Tax rate	<ul> <li>IFRS tax rate @ ~30%</li> </ul>



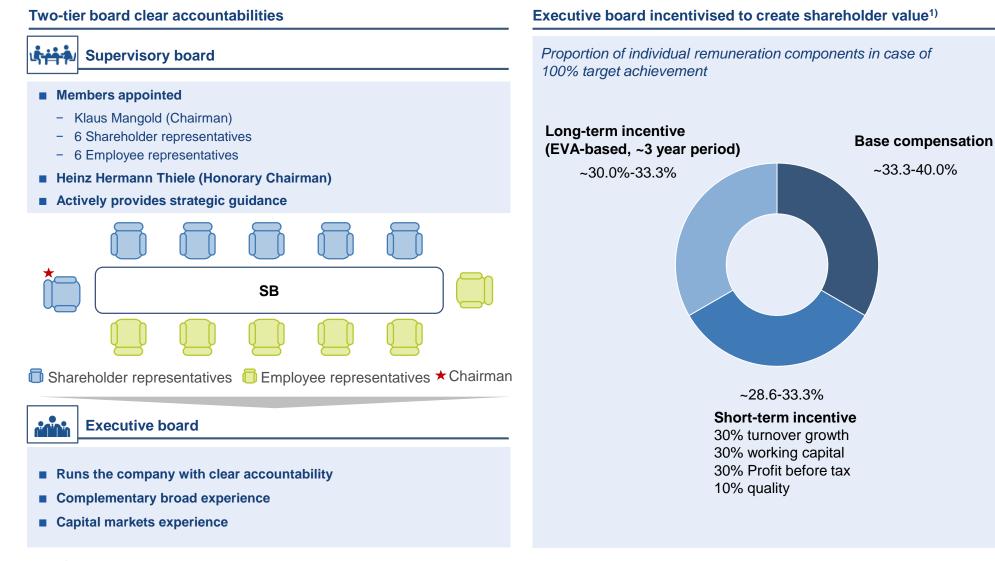
### Upcoming investor relations events

Event	Date [mm/dd/yyyy]	Location
Full Year report	04/30/2019	Munich
Berenberg USA Conf.	05/21/2019 – 05/23/2019	Tarrytown, USA
1Q 2019 Analyst Call	05/29/2019	Munich
db Access	06/06/2019 – 06/07/2019	Berlin
JPM EU Cap. Goods CEO Conf.	06/13/2019 - 06/14/2019	London
Annual General Meeting	06/18/2019	Munich



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# Effective corporate governance with clear accountabilities and aligned management incentives



Notes: <sup>1)</sup> Data as per 1.1.2019; Source: Knorr-Bremse information



# Group income statement 9M 2018

	Nine Mo	onths	3rd quar	ter
	2018	2017	2018	2017
	TEUR	TEUR	TEUR	TEUR
Revenues	4.994.045	4.562.514	1.671.805	1.586.521
Changes in inventories of unfinished/finished products	29.098	46.516	(177)	(12.610)
Other ow n w ork capitalized	40.851	23.848	21.079	9.263
Total operating performance	5.063.994	4.632.878	1.692.706	1.583.174
Other operating income	52.511	51.390	4.707	10.492
Cost of materials	(2.519.520)	(2.237.916)	(839.127)	(774.279)
Personnel expenses	(1.119.837)	(1.067.007)	(373.381)	(358.624)
Other operating expenses	(601.286)	(601.297)	(191.250)	(200.696)
Earnings before interest, tax, depreciation and amortization (EBITDA)	875.862	778.047	293.655	260.067
Depreciation and amortization	(157.569)	(161.370)	(47.691)	(66.505)
Earnings before interests and taxes (EBIT)	718.294	616.678	245.964	193.563
Interest income	17.403	16.874	6.179	5.007
Interest expenses	(28.566)	(30.954)	(10.328)	(9.640)
Other financial result	(35.973)	(25.223)	(1.157)	(299)
Income before taxes	671.158	577.374	240.659	188.631
Taxes on income	(174.235)	(187.907)	(50.727)	(68.789)
Net income	496.923	389.467	189.932	119.842
Thereof attributable to:				
Profit (loss) attributable to non-controlling interests	30.964	37.683	7.508	4.425
Profit (loss) attributable to the shareholders of Knorr-Bremse AG	465.958	351.783	182.424	115.416
	496.923	389.467	189.932	119.842
Earnings per share in Euro				
undiluted	2,89	2,18	1,13	0,72
diluted	2,89	2,18	1,13	0,72
EBITDA Margin	17,5%	17,1%	17,6%	16,4%
EBIT Margin	14,4%	13,5%	14,7%	12,2%
EBT Margin	13,4%	12,7%	14,4%	11,9%

Notes: Based on financial statements prepared in accordance with IFRS; <sup>1)</sup> Including leased personnel; Source: Knorr-Bremse information