

Global Automotive Supplier Study 2016

Being prepared for uncertainties

⁽⁰⁰²⁾
LAZARD

Roland
Berger 

July 2016





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Record profits, but
at slower growth



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Roland Berger and
Lazard Automotive
teams



Executive Summary (1/2)

- > **Looking back**, there seems to be **little reason for automotive suppliers to complain about 2015** – global profit margins remained at an **all-time high of ~7.5 percent**
- > However, the ongoing year-over-year improvement that the supplier industry has enjoyed since 2010 has largely **come to a standstill** – revenue **growth has been the lowest in seven years**, and several product segments have actually seen profit **margins slightly below the 2014 level**
- > The (aftermarket portion of the) **tire business has clearly driven average global supplier profitability** in 2015 with margins well above 10 percent – **powertrain suppliers have come under intensified pressure** (losing ground vs. 2007), while the **interior segment shows signs of recovery** following a unique intra-segment consolidation over the past two years
- > Suppliers focused on **product innovation continue to maintain a two percent average margin lead** over process-focused suppliers – however, the **top performing process specialists achieve similar profitability levels** as their innovation-focused peers
- > **Looking ahead**, suppliers will have to cope with **growing market volatility across the world** – at the same time, the (revolutionary) **changes of the future are becoming much more evident**
- > The triad market will most likely be slowly growing, and **China is entering a stage of maturity** with higher sensitivity toward macroeconomic impacts – **Brazil and Russia continue to suffer** from further reductions of demand (at least in 2016), while growth potentials in Iran or North Africa are yet to materialize
- > As a consequence, global **vehicle production is expected to grow only moderately** at ~2 percent in 2016 and beyond – suppliers will have to **rely on other factors to stabilize or even drive up their margins** to remain prepared for sudden macroeconomic shocks that could lead to substantial short-term reductions of demand

Executive Summary (2/2)

- > On the powertrain side, the development of **e-mobility is gaining a lot of momentum** – while technological hurdles prevail and a convincing business case for the end customer is nowhere close to accomplishment yet, **tightened emission regulations by (supra-)national and local bodies** will likely have a catalytic impact over the coming years
- > We expect the market for **electrified vehicles to multiply by a factor of 7-10x over the next decade** – leading to substantial growth potential for e-powertrain component suppliers while driving the traditional **combustion engine segment more and more into a commodity corner**
- > At the same time, **autonomous driving is becoming a reality** – with OEMs as well as new players combining it with vehicle connectivity (and potentially e-mobility), we expect that **completely new business models for automobile usage and ownership** will emerge within the next ten years
- > Suppliers will face a market for assisted/**automated driving components that is expected to grow by a factor of five** until 2025 – at the same time, they will likely face **fierce competition from new players** formerly outside of the automotive supplier industry keen to capture that revenue and profit pool
- > **M&A is expected to grow in relevance** for automotive suppliers to permit them to gain a technological edge in a faster moving environment or to maintain a (scale-driven) competitive edge in those segments gradually losing ground given the industry changes – However, the **complexity of acquisition-led growth will continue to be substantial** due to intense competition for attractive targets, high price levels and the challenges of global post-merger integrations
- > Ultimately, this **more volatile and rapidly changing environment** requires suppliers to **speed up their flexibility and agility** in developing (and running) their business – thinking well ahead of the next vehicle generation, scenario planning and a more innovative approach to product development will be **crucial success factors** for companies striving to be among the top performers of the future

A

Looking back

Record profits, but at slower growth



B

Looking ahead

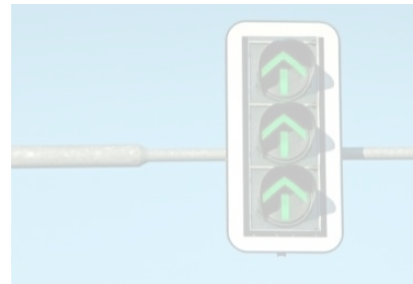
Four main challenges in the supplier industry



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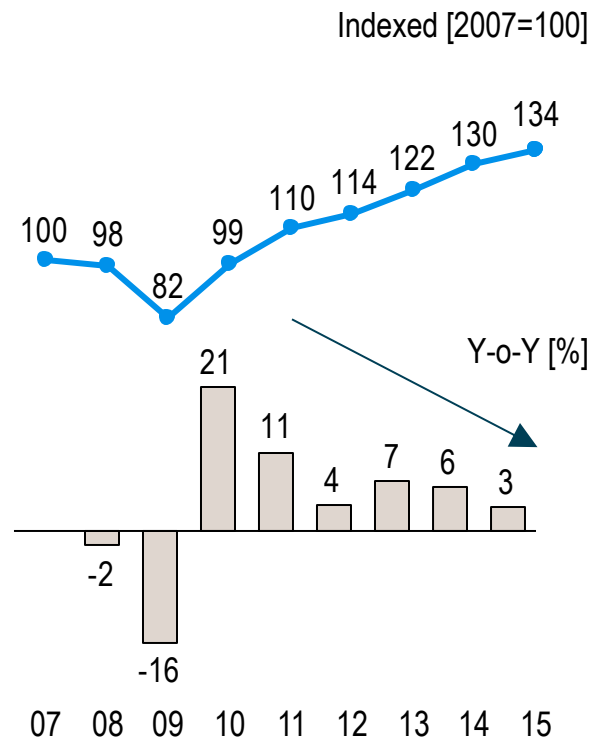




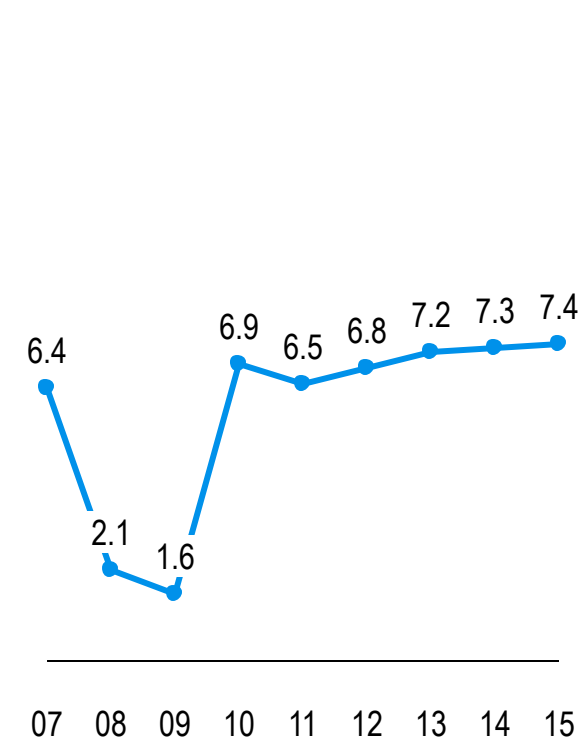
2015 was another excellent year for suppliers with record profits – However, at increased volatility and slower revenue growth globally

Key supplier performance indicators, 2007-2015e (n=~600 suppliers)

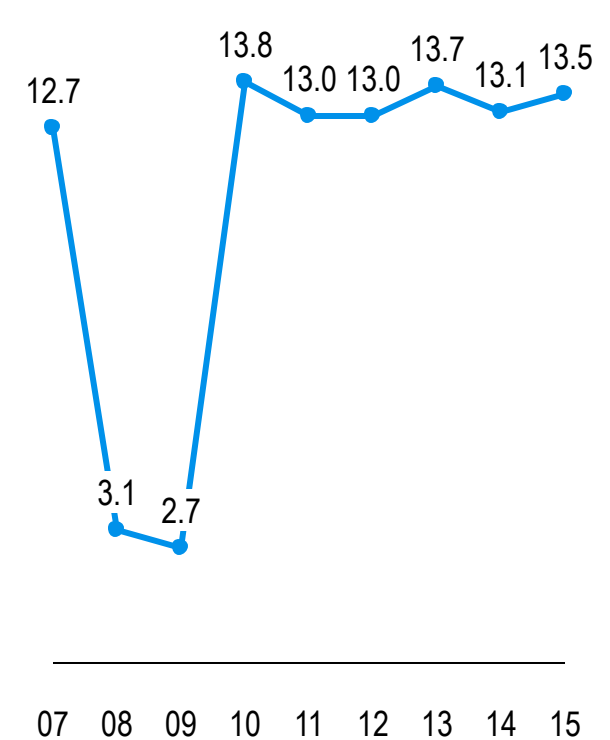
Revenue growth



EBIT¹⁾ margin [%]



ROCE²⁾ [%]

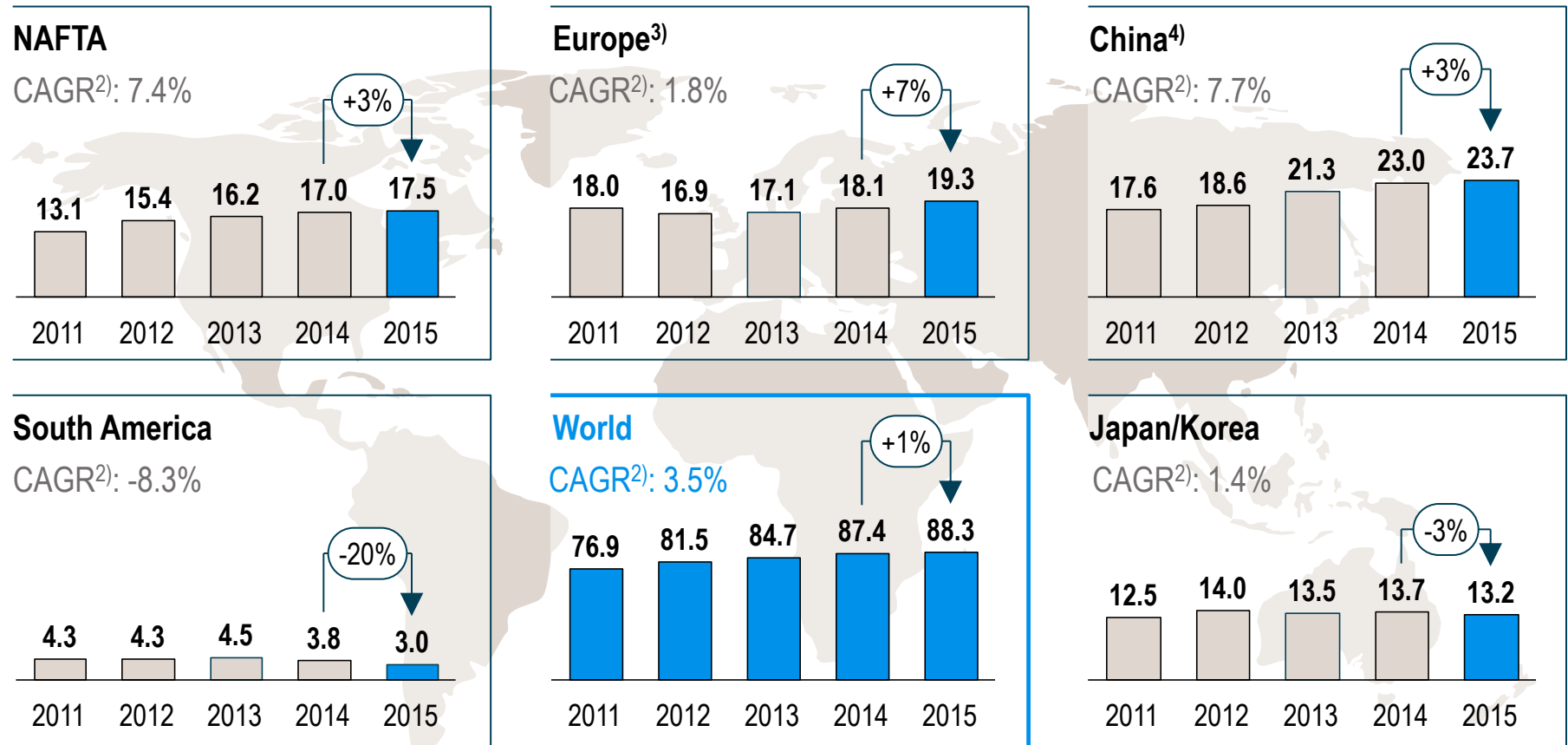


1) EBIT after restructuring items 2) EBIT after restructuring items/capital employed



Key driver of these results was growing vehicle production in the main markets – Although growth rate lower than in the past

Global light vehicle production volume¹⁾ by region, 2011-2015 [m units]



1) Incl. light commercial vehicles 2) CAGR 2011-2015 3) Excluding CIS and Turkey 4) Greater China

Financial performance of suppliers varies greatly depending on region, company size, product focus and business model

Profitability trends in the global automotive supplier industry – 2015 vs. 2007

1 Region **2** Company size **3** Product focus **4** Business model



- > **NAFTA**-based suppliers currently achieve the highest margins with >8% EBIT
- > **Europe**-based suppliers continue to show a strong performance due to their leading technology positioning

- > **Large suppliers** with >EUR 10 bn revenues maintain strong margins of ~8% EBIT
- > **Lower mid-sized suppliers** (EUR 0.5 to 2.5 bn revenues) have improved and remain above average

- > **Chassis suppliers** clearly improved margins to almost **8% EBIT** driven by ADAS and active safety
- > **Tire suppliers** maintained strong margins based on their aftermarket business

- > **Product innovators** are generating stable above-average margins of ~8% EBIT based on technology leadership translated into higher prices



- > **Chinese** supplier margins have dropped to industry average due to intensified local competition
- > **Japanese** suppliers remain at a low margin level of ~6% EBIT

- > Upper **mid-sized suppliers** (EUR 2.5 to 5 bn revenues) remain below average
- > **Small suppliers** (below EUR 0.5 bn revenues) have the lowest margins at ~5% EBIT

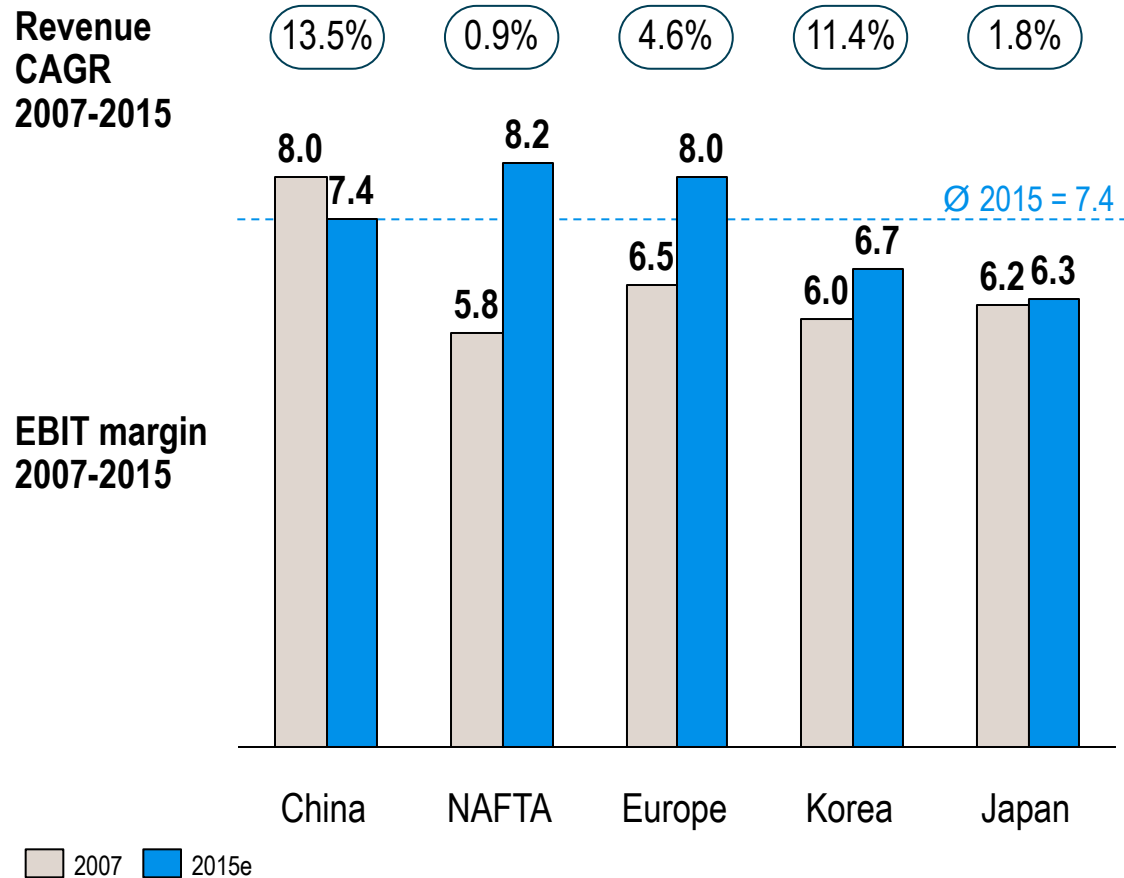
- > **Powertrain** suppliers gradually lost ground and achieve below-average margins in the meantime
- > **Interior** suppliers still trail their peers, but have shown signs of recovery recently

- > **Process specialists** continue to face below average margins of ~6% EBIT due to a lower innovation level and higher competitive pressure



NAFTA- and Europe-based suppliers are currently more profitable than average – China-based suppliers recently on the decline

Key supplier performance indicators by region, 2007 vs. 2015e [%]



- > **Europe-based** suppliers largely benefit from **leading technology** positions in many segments and a **favorable customer mix**
- > **NAFTA-based** suppliers are still leveraging the effects from their **substantial restructuring** during the 2008/2009 auto crisis and the subsequent **re-focusing on technology**
- > **China-based** suppliers have seen a decline in margins in recent years due to sharply **intensified competition** in their home market
- > **Japan-based** suppliers are trapped by dependency on their **home market** and respective OEMs



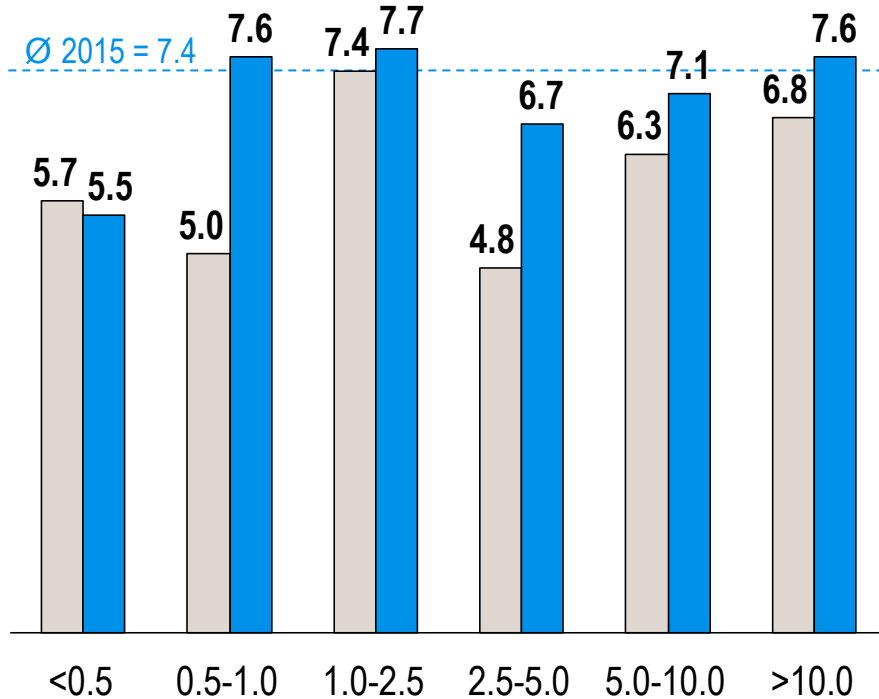
Very small and midsize suppliers lag behind in terms of EBIT margin – With widening gap to large global suppliers

Key supplier performance indicators by company size (sales in EUR bn), 2007-2015e [%]

Revenue CAGR 2007-2015

3.7% 5.1% 4.0% 3.4% 2.7% 3.9%

EBIT margin 2007-2015



2007 2015e

- > **Large multinational suppliers** (above EUR 10 bn revenues) continued to benefit from the ongoing globalization and capability to participate in the OEM platform strategy
- > **Large suppliers** (EUR 2.5-5 bn revenues) "**stuck in the middle**" – performance remains below average
- > **Midsize suppliers** (EUR 0.5-2.5 bn revenues) improved their profitability often based on a focused product portfolio and a leading technology position (for a particular component)
- > Many **very small suppliers** suffered from the growing cost of going global and the need to innovate

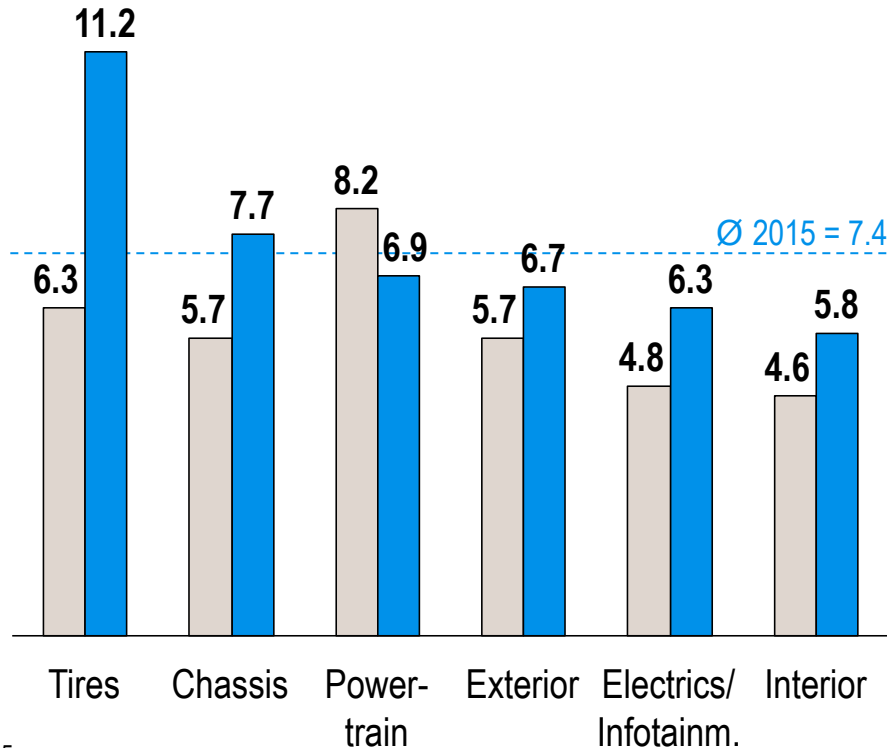
Powertrain suppliers face increasing pressure on profitability – Interior suppliers on the road to recovery?

Key supplier performance indicators by product focus, 2007 vs. 2015e [%]

Revenue CAGR 2007-2015

2.1% 2.3% 4.1% 5.8% 3.1% 2.4%

EBIT margin 2007-2015



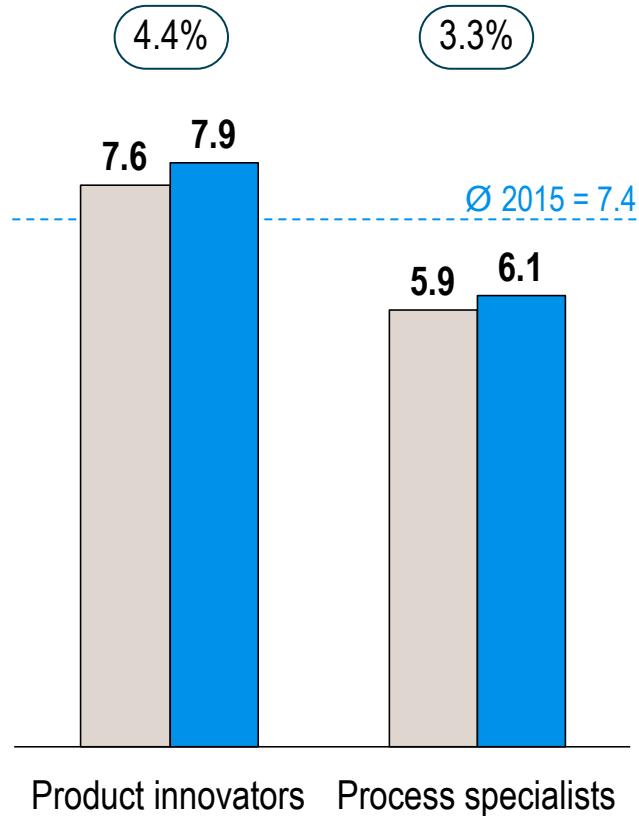
- > **Chassis** suppliers clearly improved margins over time – development increasingly driven by **advanced driver assistance** and **active safety**
- > **Interior** suppliers continue to struggle with high **commoditization pressure** – but growing relevance of vehicle interior might change the picture for the future
- > **Powertrain** margins pressurized by **intensified competition** in this growing segment **and the cost of (multiple) innovations**
- > **Exterior** suppliers partly improved due to growing **lightweight** focus
- > **Tire** suppliers benefited from their strong **aftermarket** business and recently favorable raw material costs

Product innovators clearly outpace process specialists in terms of profitability

Key supplier performance indicators by business model, 2007 vs. 2015e [%]

Revenue CAGR 2007-2015

EBIT margin 2007-2015



- > On average, innovative products feature **higher differentiation potential** and greater OEM willingness to pay
- > High **entry barriers** through **intellectual property** in many innovation-driven segments
- > **Competitive structure** more consolidated in innovation-driven segments
- > **Higher fragmentation** in many process-driven segments drives price competition

2007 2015e

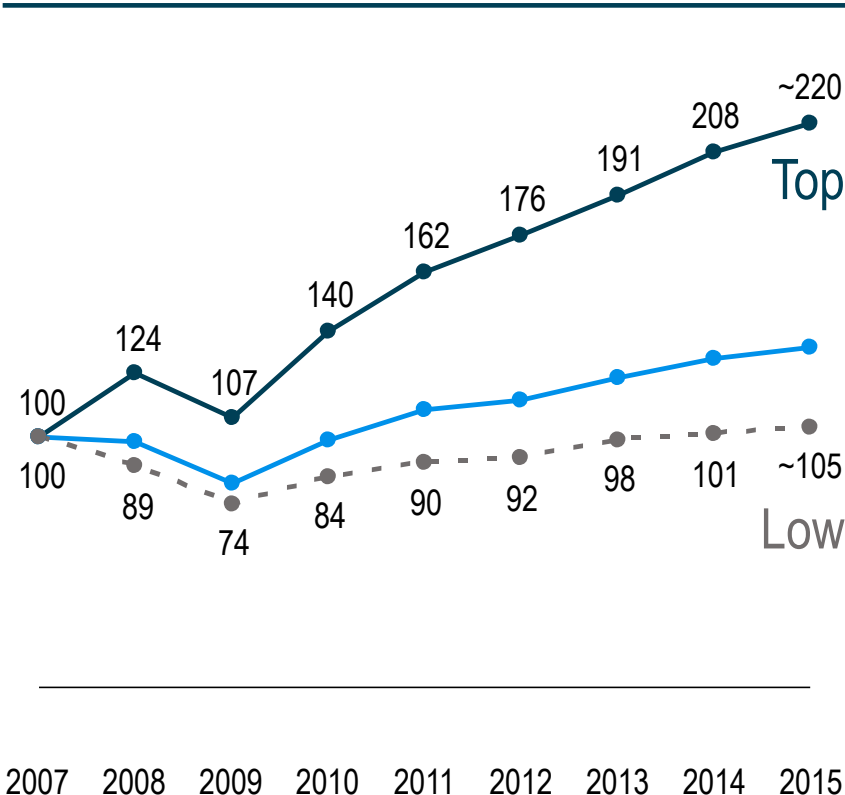
1) Business model based on innovative products with differentiation potential 2) Business model based on process expertise (while product differentiation potential is limited)



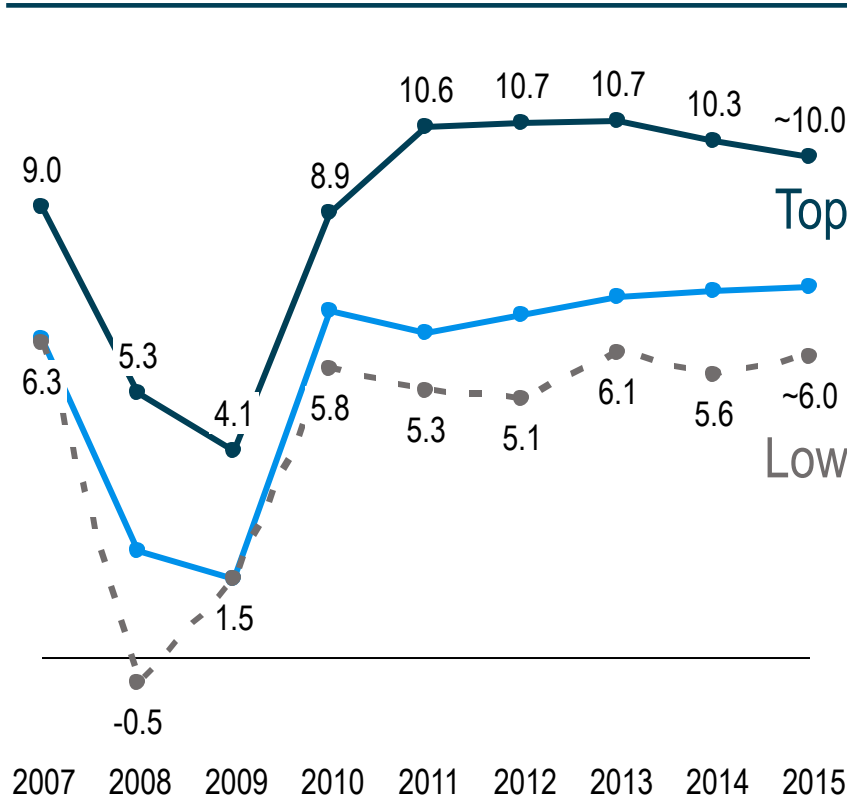
One group of top-performing suppliers has managed to grow its business at high margins

Key performance indicators of top vs. low performing suppliers¹⁾

Revenue growth [2007=100]



EBIT²⁾ margin [%]

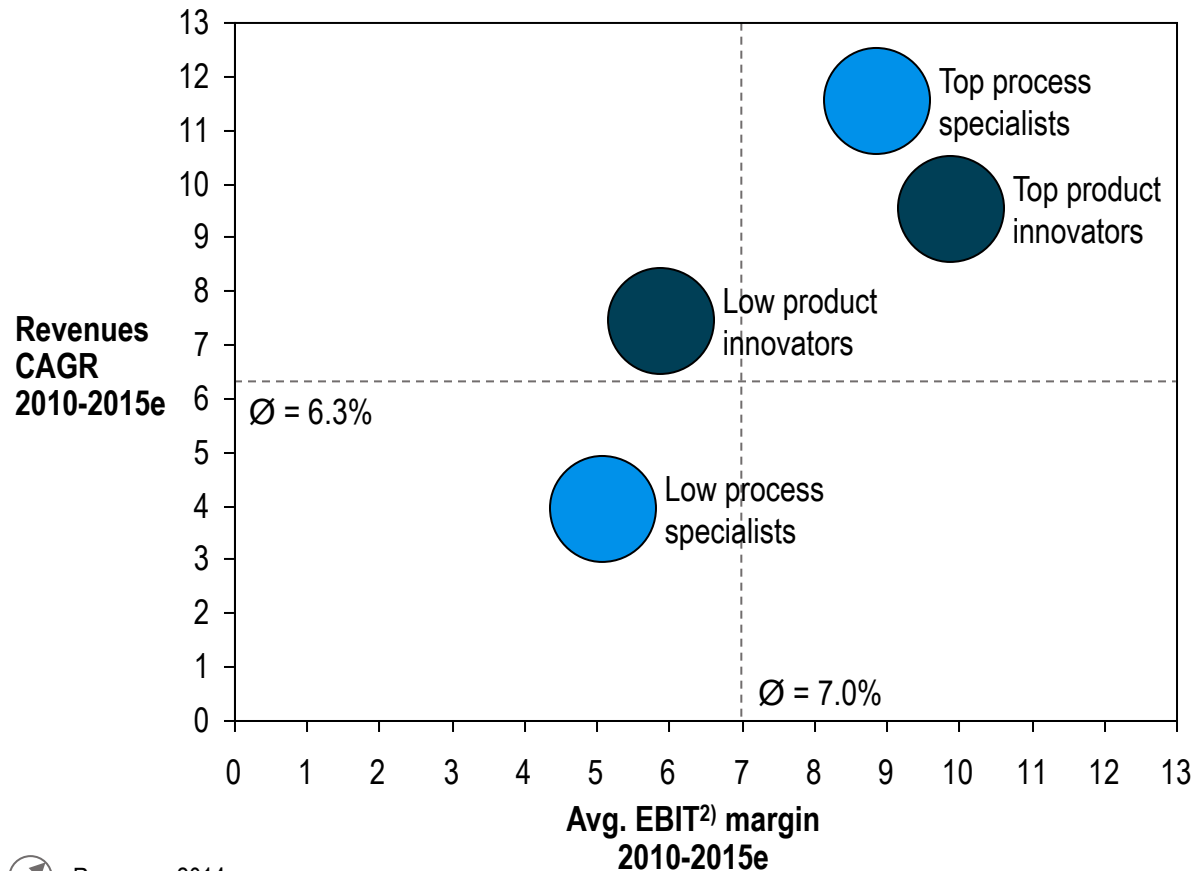


1) Top (low) performance based on above- (below-) average revenue growth 2007-2014, ROCE 2007-2014 and ROCE 2014 2) EBIT after restructuring items



However, top performance is not necessarily related to (product) innovation only

Key performance indicators of top vs. low performing suppliers¹⁾



- > **Product innovators lead process specialists in terms of average profitability** – no real difference in terms of growth
- > **Top process specialists, though, achieve average margins close to those of the top product innovators**
- > **Large difference in growth rates between top and low performing process specialists indicates the relevance of scale economies**

Revenues 2014

1) Top (low) performance based on above- (below-) average revenue growth 2007-2014, ROCE 2007-2014 and ROCE 2014 2) EBIT after restructuring items

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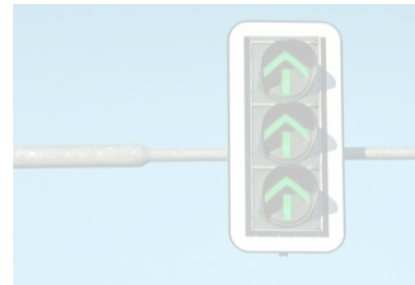
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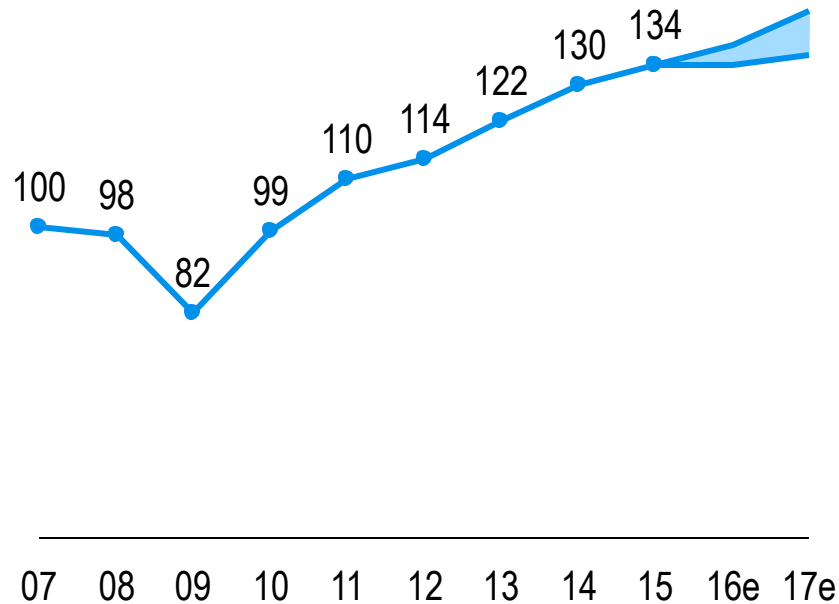




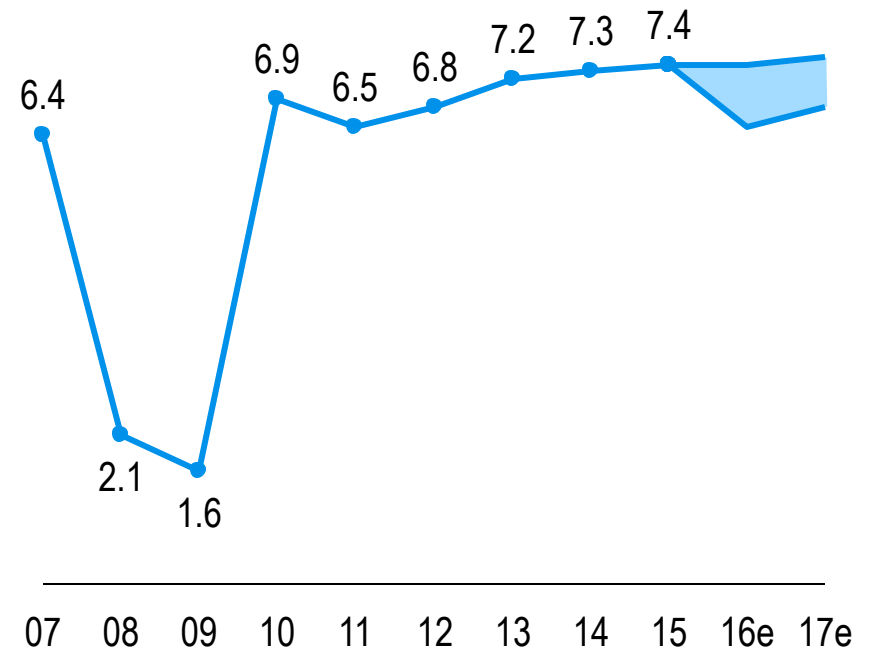
Short term, we expect even slower growth and margins still at a high level – Due to increased volatility, risks outweigh opportunities

Supplier global revenue and margin outlook, 2016/2017e

Revenue growth [2007=100]

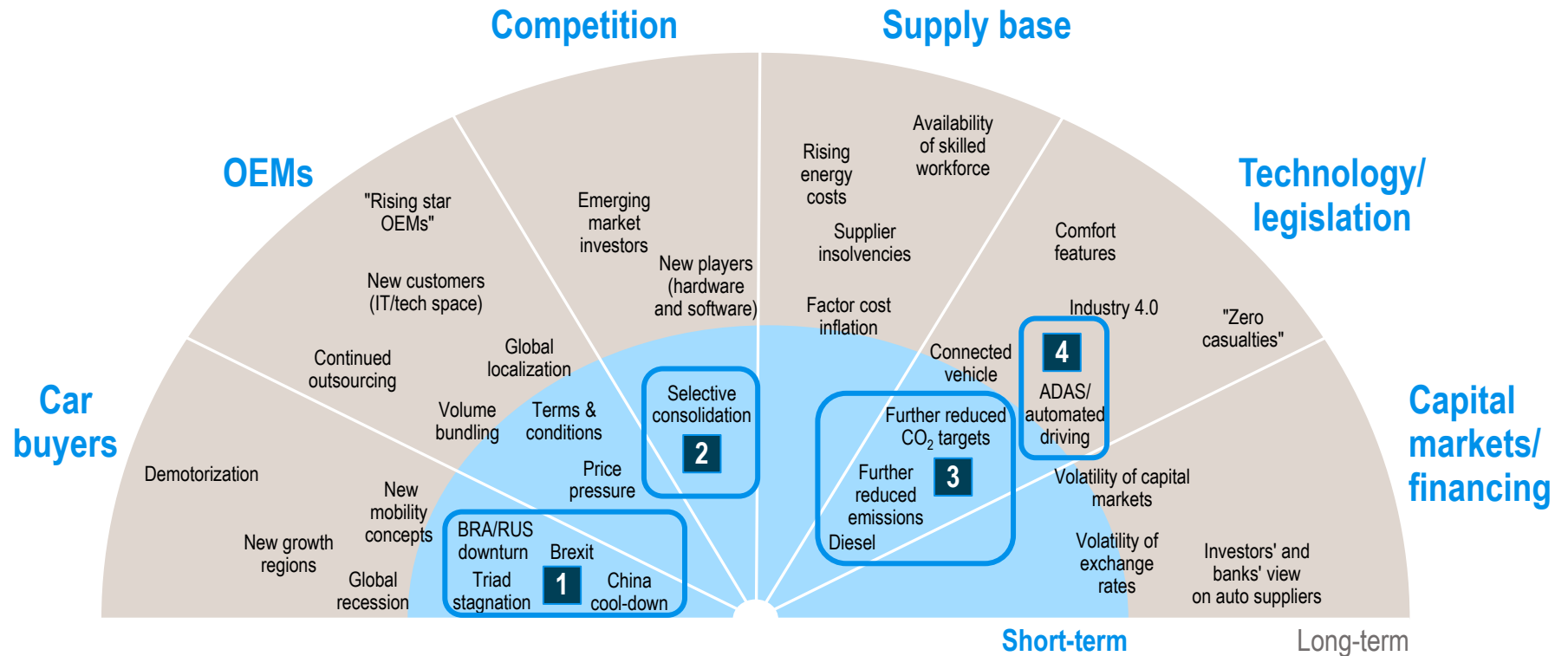


EBIT¹⁾ margin [%]



A potential market cool-down in 2016 and future technology changes stay at the top of the supplier CEO agenda

Supplier CEO radar screen for 2016 and beyond



Note: Excluding product segment specific technology and operational issues



2015 world economy was dominated by China's economic turmoil and 2016 is another volatile year

Global economic outlook



GDP growth still solid, but China outlook shaky and uncertainties from recent Brexit decision

- > Apart from China, world's economies showed solid growth rates in 2015
- > China's officials target moderate GDP growth between 6.5% and 7%
- > Expected moderate GDP growth rates 2016 for the US and EU
- > Significant uncertainties from recent Brexit decision



Low commodity prices remain?

- > 2015 prices of commodities decreased dramatically due to China's slowdown
- > Brent crude oil hit 11-year low at USD 28 a barrel in Jan. 2016, certain recovery since then
- > Will oil and other commodity prices still remain at historically relatively low levels?



Interest rates starting to diverge globally?

- > US Fed raised interest rates +0.25% for first time since 2008 in Dec. 2015
- > ECB, BoJ and PBC continue or expand supportive fiscal policies (quantitative easing)



Global trade to increase?

- > 2015 world merchandise trade expectations were corrected downwards due to falling import demand in China, Brazil and other emerging economies
- > Global trade growth is expected to slightly increase in 2016, but remains sluggish

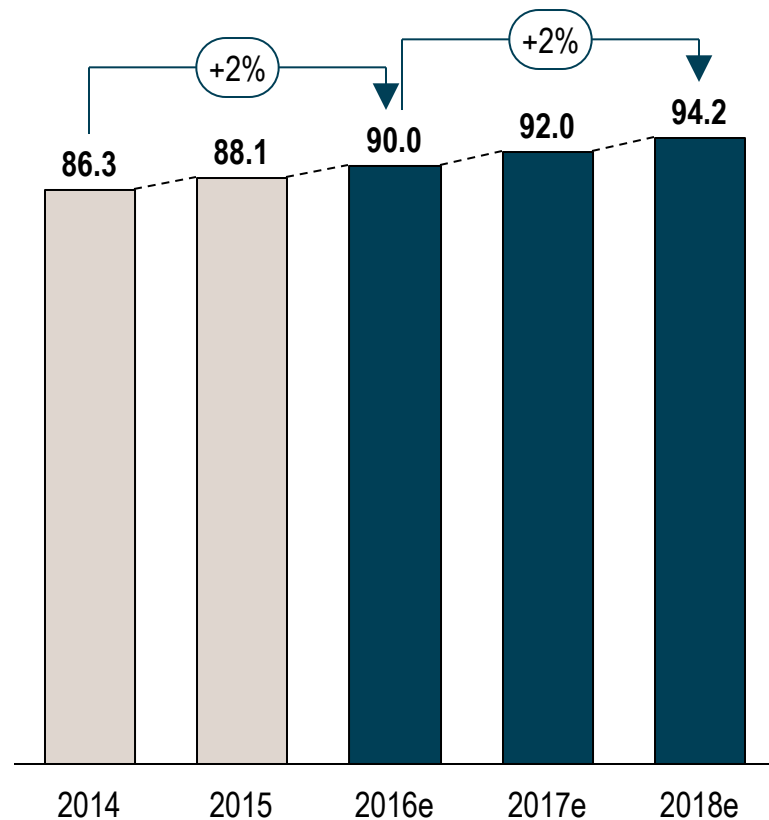


Analysts' eyes on China's stock market and Brexit








- > Despite unprecedented peaks and troughs in the Chinese stock market, the Shanghai Composite Index has actually outperformed the S&P 500 for 2015
- > Yet stock markets had a shaky start due to the China crash in Jan. 2016
- > After a substantial recovery, uncertainty on the stock markets is back due to recent Brexit decision

Global light vehicle sales growth is expected to pick up slightly over the coming years – India with strongest predicted growth

Light vehicle sales volume by region, 2014-2018e [m units]



Annual growth by region [CAGR, %]

	2014 → 2016	2016 → 2018	Volume risk ³⁾
 Europe ¹⁾	7%	1%	Medium
 NAFTA ²⁾	4%	0%	Low
 Japan	-5%	-2%	Low
 China	5%	2%	Medium
 Brazil	-25%	0%	High
 India	7%	12%	High
 Russia	-25%	12%	High

1) Excl. CIS/Turkey 2) United States, Canada, Mexico 3) Potential deviation from expected development until 2018



Development of global hotspot markets is drifting apart – China maturing, Brazil struggling, Iran revitalizing and EU faced with Brexit

Overview of global "hotspots" 2016



United States

- > **Sales of SUVs and pickups at high level** driven by low fuel prices
- > **Vehicle emissions** receive new attention due to **COP21** and **diesel** controversy
- > New **mobility business models** emerge with the US being a frontrunner



Europe

- > **Unexpectedly high growth** of sales volumes across most markets in first months of 2016
- > **Controversy about emissions** (and diesel in particular) in the public debate
- > EV sales still **not picking up yet**
- > **Uncertainty** arising from **Brexit** decision



China

- > **SUV and MPV boom** continues, but overall growth slows down
- > **Chinese OEMs** reinforce their market position as quality increases
- > **EV market starting** to evolve



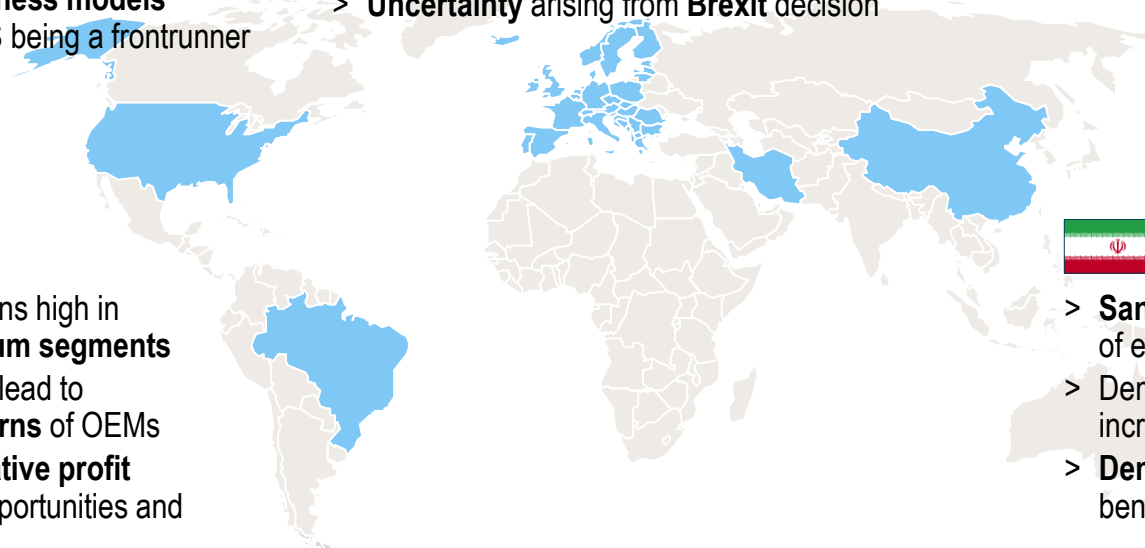
Brazil

- > **Competition** remains high in **budget** and **premium segments**
- > Sales volume risks lead to **profitability concerns** of OEMs
- > OEMs seek **alternative profit streams** (export opportunities and aftersales)



Iran

- > **Sanctions lift** promotes **growth** of economy and vehicle demand
- > Demand for **high-quality cars** increases
- > **Demographics** develop in a beneficial manner









Global markets will likely become more volatile – Suppliers will have to actively manage a set of "hotspots" in their regional portfolio

Implications for automotive suppliers

- 1 | Overall, global vehicles sales and underlying **vehicle production are expected to grow only moderately** in 2016 and beyond – suppliers will have to **rely on other factors** to stabilize or drive up their margins
- 2 | The **Chinese market is entering a stage of maturity** with lower average growth rates and higher sensitivity toward macroeconomic impacts – suppliers **need to review** (and potentially adjust) the **revenue and capacity plans** for their Chinese operations
- 3 | The **Brazilian and Russian markets continue to suffer** from further reductions of demand at least in 2016 – existing **restructuring efforts of suppliers require further enforcement**, however, a **complete exit** from either market seems **advisable in rare cases only**
- 4 | **Iran** and (to a lesser extent) **North Africa emerge** as new high growth areas in the global automotive vehicle production landscape – suppliers have to carefully **balance the resulting opportunities against the associated risks** from underdeveloped automotive infrastructures, possible OEM dependencies, legal conditions, or potential political instabilities
- 5 | The level of **macroeconomic volatility and uncertainty, recently fueled by the Brexit decision, is higher** than in previous years – suppliers need to **remain prepared for a sudden macroeconomic decline** that could lead to substantial **short-term reductions of demand** in one (or more) of the global regions they operate in

Most recent M&A deals were driven by technology and customer/ market access – Economics-driven consolidation still not picking up

Major types of M&A motivation

	 Technology access	 Market/customer access	 Economics-driven consolidation	 Financial value creation
Rationale	<ul style="list-style-type: none"> > Gain access to new or strengthen existing technology/material or process capabilities to secure/establish USP (horizontal and vertical) 	<ul style="list-style-type: none"> > Gain access to regions or customers not served to date – via existing business or asset deals (e.g. capacity of production locations) 	<ul style="list-style-type: none"> > Optimize highly fragmented and inefficient market structures 	<ul style="list-style-type: none"> > Create value by turning around under-performing or distressed assets and/ or divestments
Dominant acquirers/ domains	<ul style="list-style-type: none"> > Established, larger suppliers > Recently, also OEMs in the field of autonomous driving 	<ul style="list-style-type: none"> > In the past, typically driven by established market players, today primarily led by emerging market players 	<ul style="list-style-type: none"> > Typically occurring in process-focused segments with pressure on revenues, margin and utilization 	<ul style="list-style-type: none"> > Manufacturing-focused financial buyers, mainly private equity firms
Empirical evidence in recent deals	<ul style="list-style-type: none"> > Easiest to communicate sustainable "value add" to investors > Driver of many Chinese transactions 	<ul style="list-style-type: none"> > Pure "expansion" deals without technology focus are rare > Driver of many cross-border transactions, e.g. from Japan 	<ul style="list-style-type: none"> > Not favored by the OEMs in many cases > Buyers often cautious about restructuring activities required 	<ul style="list-style-type: none"> > Due to healthy sector environment, rather muted deal activity in this area

The overall M&A landscape is still diversified internationally – Chinese players established as an important buyer group

Selected automotive supplier acquisitions, 2011-2016 (YTD)

2011	2012	2013	2014	2015	2016
BHAP / Inalfa	Bohong / Wescast Industries	Amtek / Neumayer Tekfor	Amtek / Kaiser	AVIC Automotive / Henniges	Freudenberg / TBVC
Citic / KSM Castings	Bosch / SPX	BorgWarner / Wahler	Amtek / Kuepper Group	BorgWarner / Remy International	Illinois Tool Works / TRW Auto. Elec. & Comp.
CQLT / Saargummi	Continental / Freudenberg molded brake parts	Gentex / JCI HomeLink	AUNDE / Fehrer	China National Tire / Pirelli	Musashi Seimitsu / Hay
Gestamp / ThyssenKrupp MF	Continental / Parker Hannifin MCS	Gentherm / W.E.T. Automotive	AVIC / Hilite	Continental / Elektrobit	Megatech / Boshoku Europe
GKN / Getrag driveline bus.	Delphi / FCI MVL	Grammer / Nectec	AVIC / KOKI Technik	Delphi / HellermannTyton	Ningbo Joyson / KSS
Inteva / A. Meritor Body Syst.	Faurecia / ACH Interiors	Halla / Visteon climate business	Bosch / ZF Lenksysteme	Grupo Antolin / Magna interior business	Plastic Omnium / Faurecia exterior bus.
Iochpe-Maxion / Hayes Lemmerz	Grupo Antolin / CML	Huayu Auto. Systems / Yanfeng Visteon JV	Delphi / Unwired Technology	Harman / Symphony Teleca/Redbend	Yinyi Group / Punch Powertrain
Martinrea / Honsel	Hebei Lingyun / Kiekert	Mahle / Behr	Federal-Mogul / TRW valves business	Johnson Electric / Stackpole	Valeo / FTE Automotive
Ningbo Huaxiang / Sellner	Lear / Guilford Mills	Nidec / Honda Elesys	Lear / Eagle Ottawa	Linamar / Montupet	
Ningbo Joyson / Preh	Magna / Ixetic	Ningbo Huaxiang / HIB Trim Parts	MAHLE / Letrika	Magna / Getrag	
Nisshinbo / TMD Friction	Metalsa / ISE Automotive	TMT / ZF Boge	Sensata / Schrader	MAHLE / Delphi thermal business	
Samvard. MOTHERSON / Peguform	Nemak / JL French Automotive	Tokai Rubber / Anvis	Shanghai Prime Machinery / Nedschroef	Mann+Hummel / Affinia	
Toyota Boshoku / Polytex Auto Interior	Tupy / Cifunsa	Wangfeng / Meridian Lightweight	Visteon / JCI auto. electronics bus.	NGK Spark Plug / Wells Vehicle Electronics	
Valeo / Niles	Wuhan Iron & Steel / ThyssenKrupp TB	Wanxiang Group / A123	ZF / TRW	Valeo / Peiker Acoustic	

Key: Acquirer / Target



As a result, supplier stocks and subsequently acquisition targets have become more expensive

Evolution of automotive supplier valuations

EV/EBITDA NTM¹⁾



- > Strong and profitable growth in previous years has led to a **re-rating of automotive supplier valuations**
- > **Increased stock valuations** paired with **increased competition** for available assets have fueled M&A valuations
- > **M&A valuation levels have reached 8-9x EV/EBITDA** in recent important strategic transactions compared to **5-6x in earlier years**

— Japanese suppliers³⁾ — European suppliers⁴⁾ — North American suppliers⁵⁾

1) NTM = Next twelve months 2) Excluding the distorting impact of the economic crisis (Jan-Dec 2009 multiples) 3) Aisin Seiki, Bridgestone, Calsonic Kansei, Denso, Exedy, JTEKT, Keihin, Koito, Mitsubishi, NHK Spring, NSK, Stanley Electric, Showa, Takata, Tokai Rika, Sumitomo Riko, Toyota Gosei, Toyota Boshoku and TS Tech 4) American Axle, BorgWarner, Cummins, Dana, Delphi, Federal-Mogul, Iochpe, Johnson Controls, Lear, Magna, Martinrea, Meritor, Tenneco, Tower, Visteon and Wabco 5) Autoliv, Autoneum, Brembo, CIE, Haldex, Continental, ElringKlinger, Faurecia, Georg Fischer, Grammer, Leoni, Norma, Plastic Omnium, PWO, SHW, SKF, Valeo, Hella and Stabilus



The ongoing M&A activity level is gradually reshaping the competitive landscape – Suppliers need to participate actively

Implications for automotive suppliers

- 1 | The **ongoing M&A activity** in the automotive supplier industry will likely continue to be fueled by high amounts of available liquidity among corporates and financial investors as well as **substantial interest of Chinese/Asian buyers**
- 2 | As a result, the **price level** for automotive supplier acquisitions, which has grown considerably with **EBITDA multiples being up to 50-100% higher** than 5-10 years ago, is expected to remain high especially for attractive assets – despite currently low financing cost, **proper business cases** based on operational synergies become **more difficult to realize**
- 3 | **Strategic investors from China** play a much more active role in the Triad M&A markets nowadays, **seeking to buy technology** access – **rise of new competitors** for incumbent (Western) suppliers, first in the Chinese market, but prospectively also in the Triad
- 4 | In an environment of higher technological disruption and more short-term evolution of technologies, active portfolio management through **M&A is growing in relevance for building up technological capabilities** vs. organic development – to stay competitive, suppliers **need to screen the market actively** for potential acquisition targets
- 5 | In addition, **suppliers should take an active approach in portfolio management** measures, considering **disposals of non-core/commodity areas** to clean up unhealthy competitive structures and **free up invested capital** for better use

Challenge to reduce emissions and "Dieselgate" have led to acceleration of debate on the future of powertrains

Press clippings on powertrain future



Blue environmental badge to come – diesel remains cheaper than gasoline"
heise online (04/2016)



"Everything we do is first driven by the customer, but certainly the regulatory requirements influence the technologies that we're introducing"
R. Nair, Ford (01/2016)



"After Paris, Madrid follows and bans dirty diesel cars by 2020"
TransportEnvironment (01/2016)



"I am a big fan of electromobility. But for the next few years, we won't be able to do without diesel, especially when it comes to meeting CO₂ targets"
Dr. H. Krüger, BMW (10/2015)

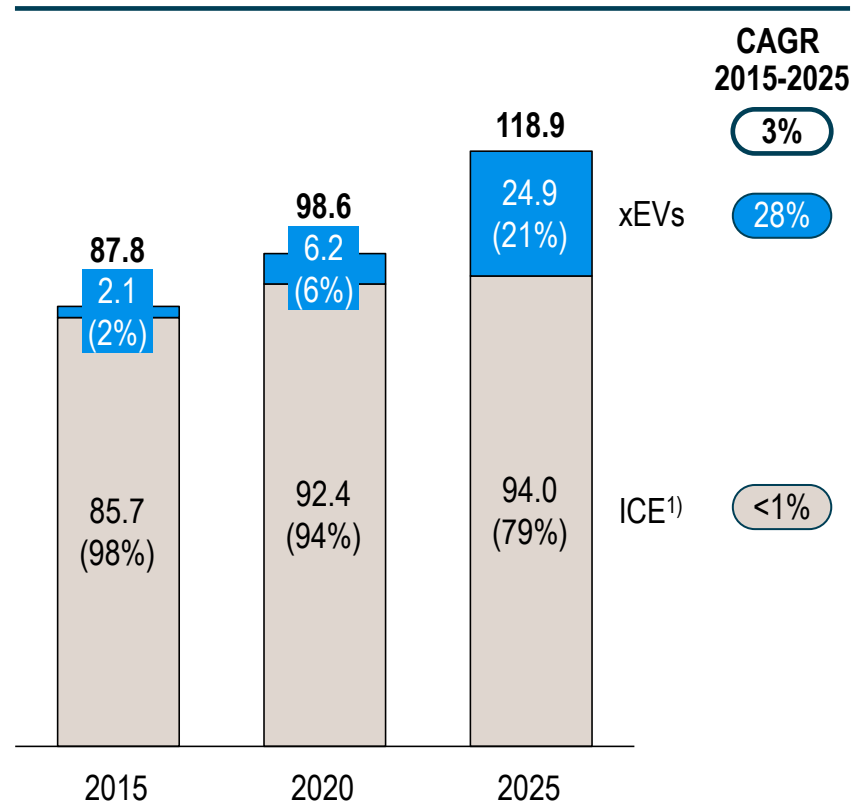


"Tesla Model 3's first week: 325,000 orders"
CNN Money (04/2016)

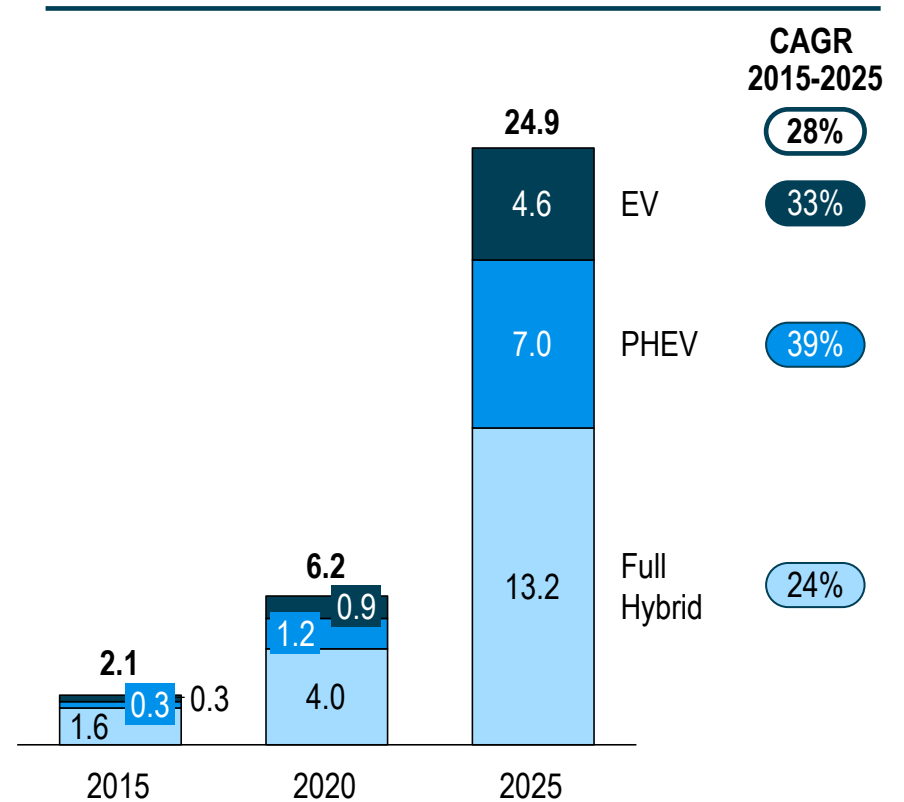
Compliance strategies of OEMs will lead to increased production of alternative powertrains – Electrification expected to play a key role

Implications on powertrains (1/2): Alternative powertrains

Global powertrain production [m units]



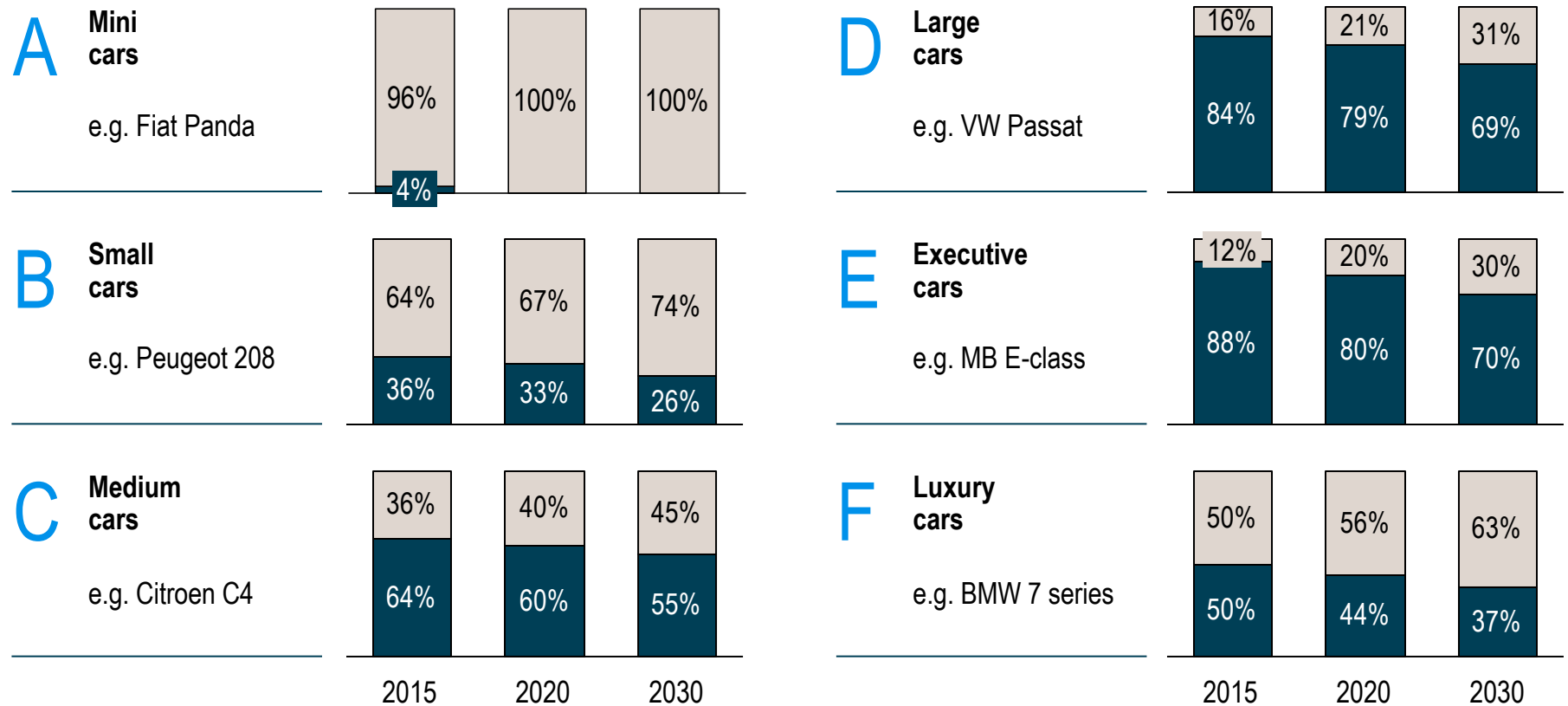
Global xEV production [m units]



1) Including mild hybrid vehicles (up to 20 kW) and ICE start-stop

Diesel powertrain still expected to hold dominant position in upper passenger car segments, but decline across all segments until 2030

New car diesel forecast by segment in EU-28 until 2030¹⁾

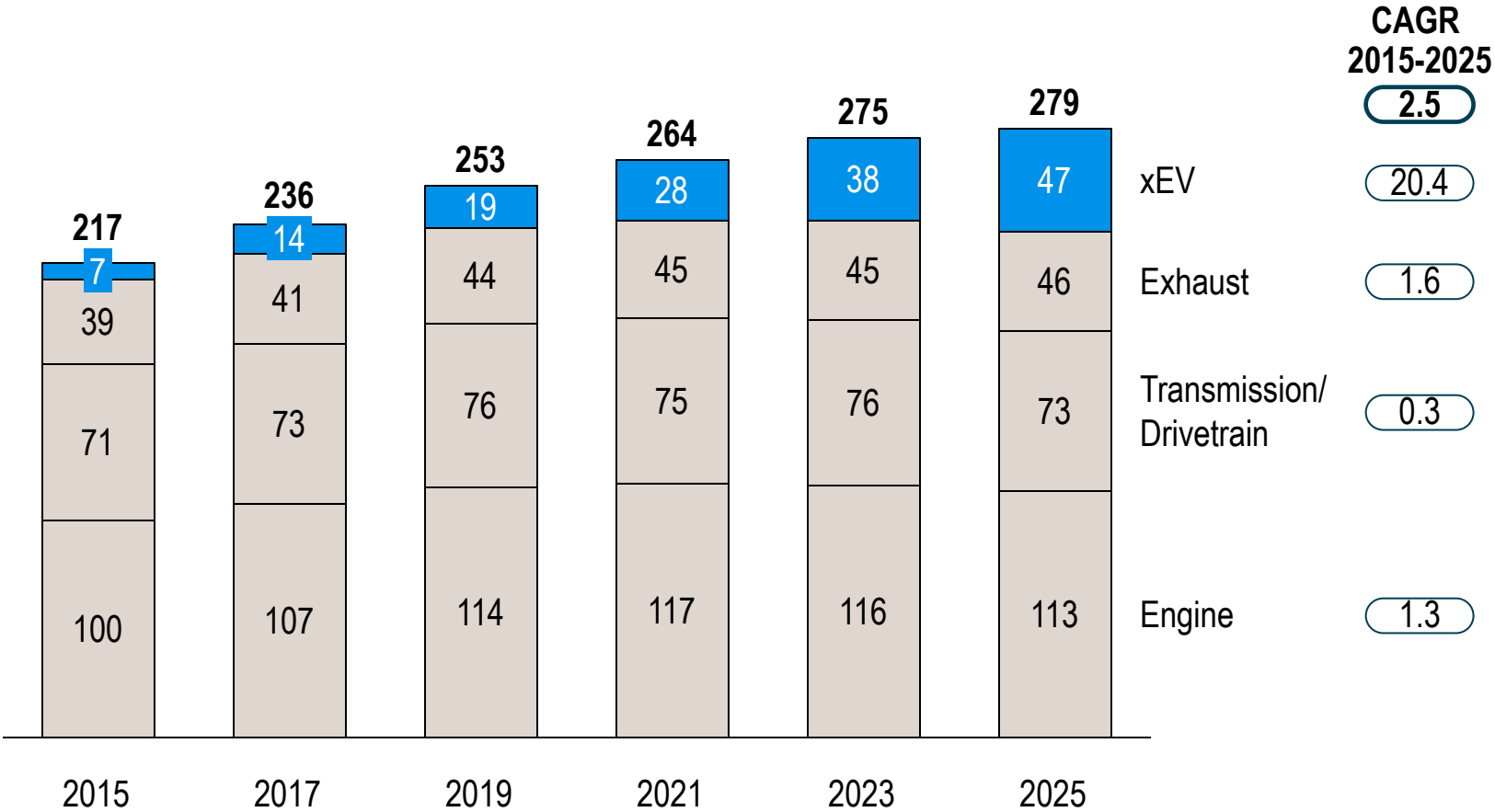


Other powertrains Diesel (incl. MH diesel)

1) In % of new car sales

The global powertrain component market is expected to grow to EUR ~279 bn by 2025 – Substantial shift toward xEV

Market development of powertrain components for light vehicles [EUR bn]





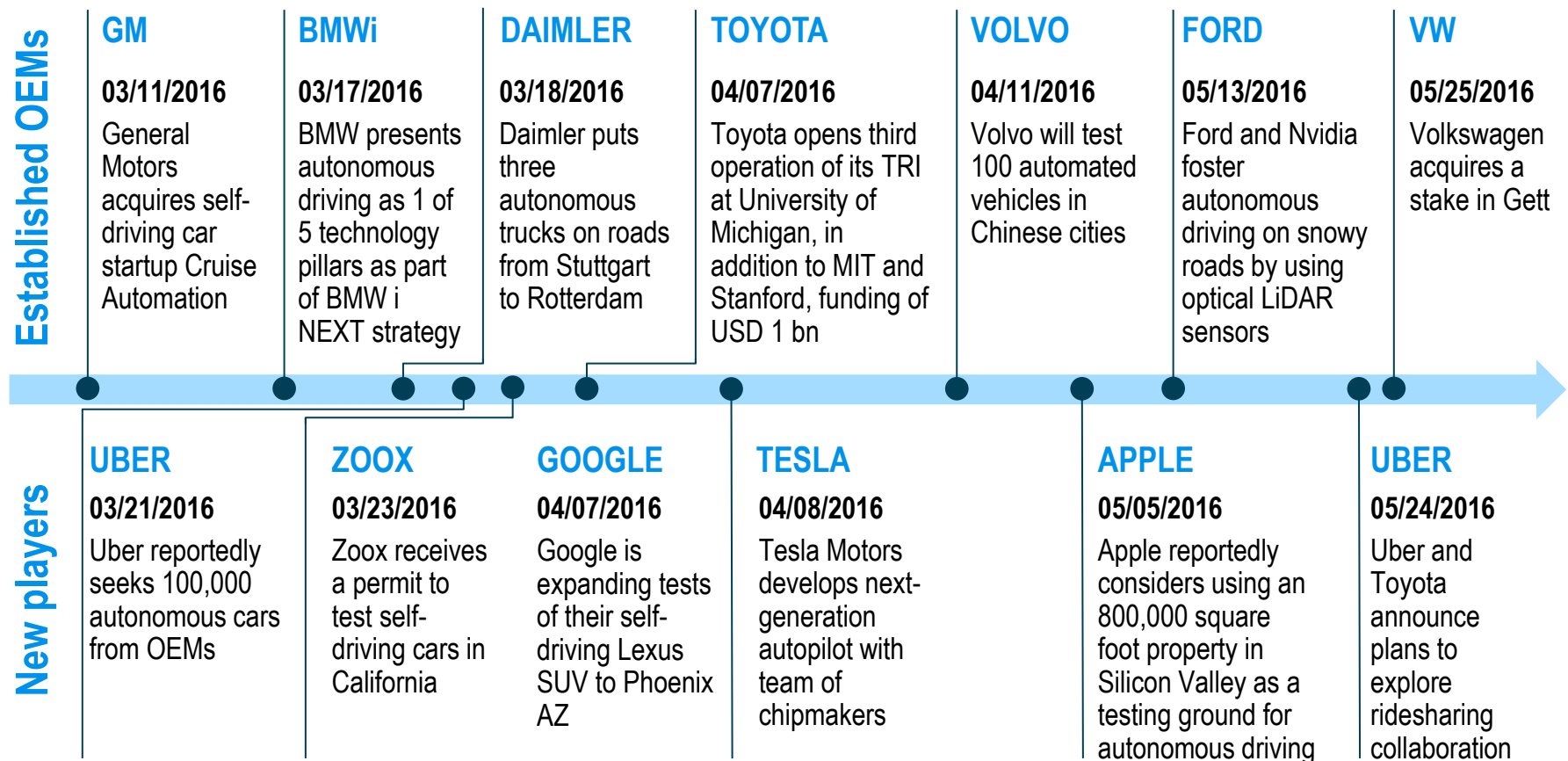
The powertrain mix is expected to substantially change over the next decade – New opportunities vs. wind-down of traditional business

Implications for automotive suppliers

- 1 | Tightened **emission regulations** will further drive up complexity and **cost of the exhaust system** especially for diesel – **short-term revenue potential** for certain suppliers
- 2 | **Diesel** is expected to **gradually decline in market share** in Europe over the coming years – **challenging business situation** especially for those diesel-focused **suppliers who do not offer comparable gasoline products**
- 3 | The pace of **innovation of the internal combustion engine's** development will **slow down markedly** after 2020 – **commoditization of business** for conventional engine component suppliers in the mid/long term
- 4 | The market for **e-mobility components** will likely see **rapid growth** over the next decade – traditional **automotive suppliers facing growing competition** from both new entrants (e.g. for batteries) as well as OEMs increasing their own value creation
- 5 | The total **per vehicle cost of powertrain** will further go up driven by electrification and tighter emission requirements – incremental revenue **potential for powertrain suppliers**, but **growing cost pressure in other domains**
- 6 | A sudden **change in regulation** might lead to a **disruptive e-mobility breakthrough** even in the mid term – need to **foster scenario planning** among suppliers

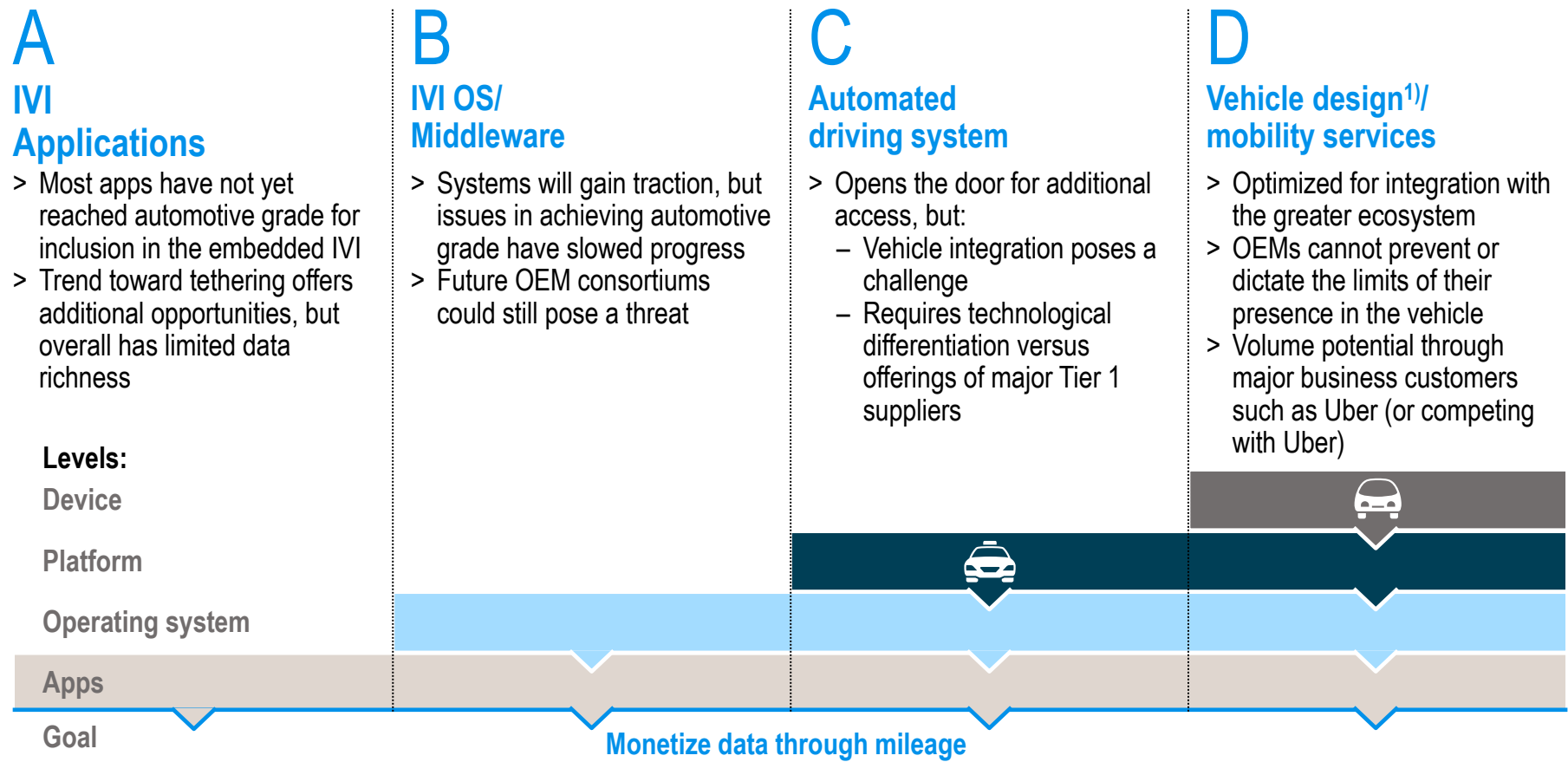
Activities of OEMs and tech giants show that automated driving is becoming a reality and that the race for leadership is on

Recent activities in automated driving



New players entering the automotive industry might drive completely new mobility services – AD likely to be one main technology enabler

Case study: IT players' battlefronts in automotive

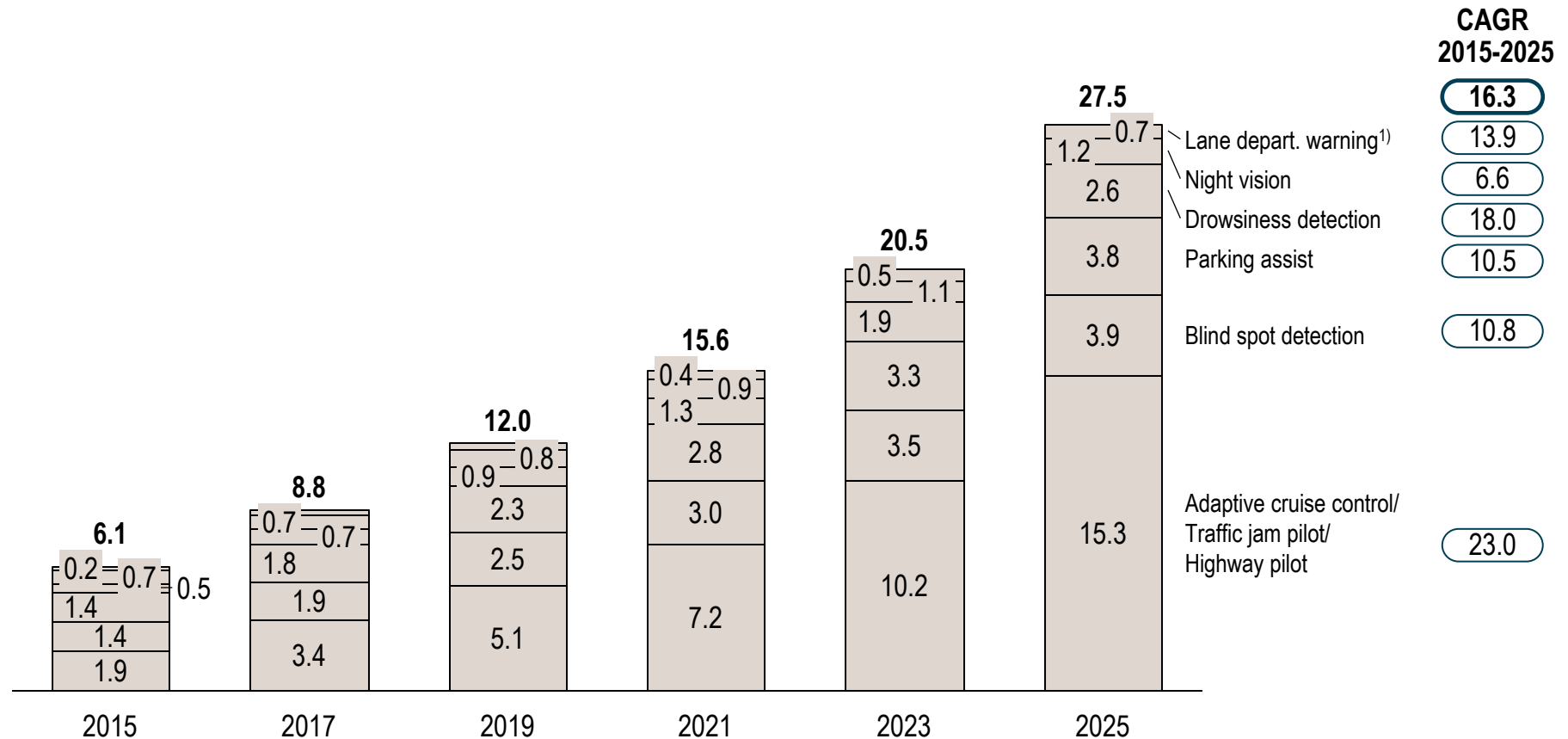


1) Includes finding partners to produce vehicles



The ADAS and AD component market is expected to grow by ~16% p.a. until 2025 and reach a global volume of almost EUR 30 bn

Market development of ADAS/AD systems for light vehicles [EUR bn]



1) incl. lane keep assist

Automated driving to become reality over the next decade – Suppliers face changing competition and new capability requirements

Implications for automotive suppliers

- 1 | The overall **penetration of ADAS/AD features will likely rise** dramatically over the next decade – rapidly **growing revenue pool** for automotive suppliers (as well as other players)
- 2 | Most of the additional functionalities (and thereby revenues) will be **software-driven – huge additional potential** for **software-focused suppliers**
- 3 | **OEMs will likely expand their control** of ADAS/AD component design and specification – **limited potential** for suppliers to sell **fully integrated systems** as one-stop-shop solutions
- 4 | Traditional **electronics hardware component suppliers gradually expand their value chain coverage** into ADAS/AD component development – **new competitive threat** to incumbent automotive suppliers from their own supply base
- 5 | Future ADAS/AD components will largely be based on **standardized hardware and differentiated via software** (at shorter development cycles) – **enhancement of software development capabilities needed** among almost all suppliers
- 6 | ADAS/AD might become a **main feature of a new type of vehicles** offered by potential new entrants (e.g. Google) as part of an integrated mobility solution – **new revenue potential** for automotive suppliers with new customers (across all component segments), but **at the expense of conventional OEM business**

A

Looking back

Record profits, but at slower growth



B

Looking ahead

Four main challenges in the supplier industry



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Conclusions

Key actions for automotive suppliers



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Contacts

Roland Berger and Lazard Automotive teams

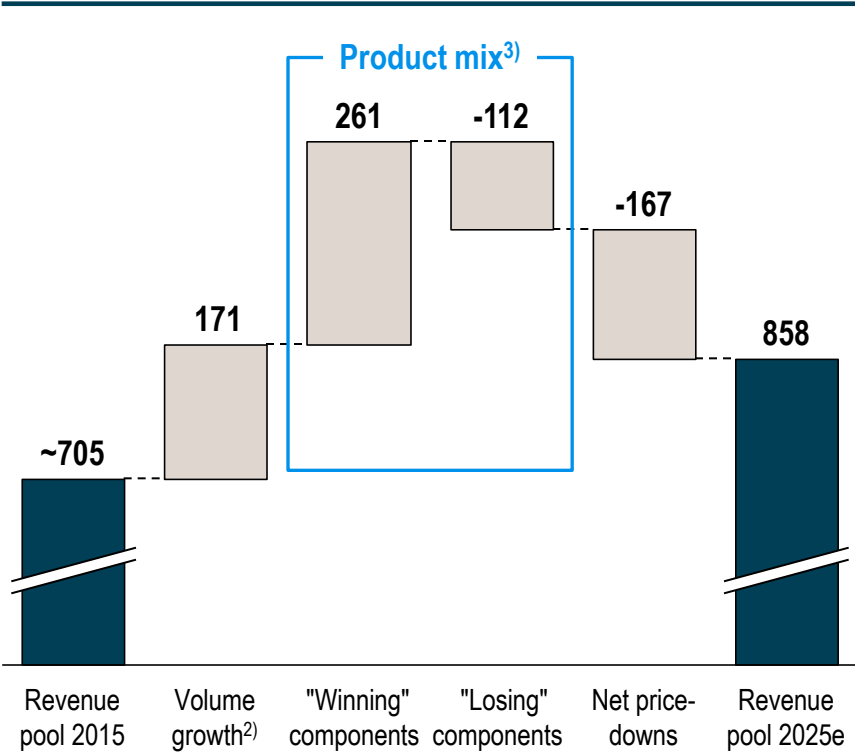




The market for auto suppliers is expected to yield substantial further growth opportunities – Innovation will be key to capturing them

Global automotive component market development 2015 vs. 2025

Component market value¹⁾ [EUR bn]



Winning and losing components

Losers		Winners		
Diesel - Unit injector	■ ■ ■ ■ ■	Powertrain/ xEV	H2 tanks	■ ■ ■ ■ ■
Diesel - Indirect injectors	■ ■ ■ ■ ■		BSG 48V	■ ■ ■ ■ ■
AT (3/4 stage)	■ ■ ■ ■ ■		Fuel cell	■ ■ ■ ■ ■
Starter	■ ■ ■ ■ ■		Battery cells	■ ■ ■ ■ ■
Generators	■ ■ ■ ■ ■		Large e-motors	■ ■ ■ ■ ■
Power pack e-hydraulic	■ ■ ■ ■ ■	Chassis/ ADAS	Electric/mechanical caliper	■ ■ ■ ■ ■
Power pack hydraulic	■ ■ ■ ■ ■		Coil springs - Composite	■ ■ ■ ■ ■
Power pack pinion EPS	■ ■ ■ ■ ■		Leaf spring - Composite	■ ■ ■ ■ ■
Brake booster (passive)	■ ■ ■ ■ ■		ADAS/HAD	■ ■ ■ ■ ■
Leaf springs conventional	■ ■ ■ ■ ■		Electric parking brake	■ ■ ■ ■ ■
Longitudinal beam - Steel	■ ■ ■ ■ ■	Exterior	A-Pillar - Composite	■ ■ ■ ■ ■
Front wall cross beam - Steel	■ ■ ■ ■ ■		B-Pillar - Composite	■ ■ ■ ■ ■
Hood - Steel	■ ■ ■ ■ ■		Roof cross member - Composite	■ ■ ■ ■ ■
Rear lamps - Conventional	■ ■ ■ ■ ■		Rear cross member - Composite	■ ■ ■ ■ ■
Trunk lid - Steel	■ ■ ■ ■ ■		Tunnel - Composite	■ ■ ■ ■ ■
HVAC module (w/o AC)	■ ■ ■ ■ ■	Interior	AC compressor - Electric	■ ■ ■ ■ ■
Parking heater	■ ■ ■ ■ ■		Pedals - Electronic	■ ■ ■ ■ ■
Window lifter - Mechanical	■ ■ ■ ■ ■		HVAC EV	■ ■ ■ ■ ■
AC compressor - Conventional	■ ■ ■ ■ ■		PTC heater - xEV heaters	■ ■ ■ ■ ■
HVAC control - Manual	■ ■ ■ ■ ■		Seat structure (lightweight)	■ ■ ■ ■ ■

■ up to -10% ■ ■ up to -20% ■ ■ ■ more than -20%
 ■ ■ up to +20% ■ ■ ■ up to +40% ■ ■ ■ ■ more than +40%

1) Light vehicle OE market, excluding commercial vehicle and aftermarket portion
 2) Change driven by vehicle production volume (volume per car at 2015 level)
 3) Additional growth/decline caused by change in product/technology content per car



Suppliers will have to deal with an even higher degree of uncertainty regarding future innovations – While maintaining an eye on costs

Key actions for automotive suppliers

- 1 | Conduct **scenario planning exercises** on a regular basis to prepare for a potential disruptive **breakthrough of e-mobility and automated driving** (e.g. robocabs) **in the mid term** – especially relevant for powertrain suppliers, but affecting all other domains as well
- 2 | Enforce **shift of investment focus to key product innovations** (xEV, composites, ADAS/AD software, HMI, etc.) without jeopardizing the development capabilities for existing core products
- 3 | Drive-up **speed and flexibility in the research and development** process – Establish dedicated **innovations teams outside of the traditional R&D organization** and processes dealing with new products/solutions
- 4 | Foster **active portfolio management** – leverage favorable financing conditions for (technology-driven) acquisition while considering **divestment of businesses with limited long-term growth perspectives** (but still a feasible business case in the mid term)
- 5 | Maintain tight cost management and continue to **resolve structural issues** in footprint and overhead while economic **conditions are still favorable** – especially relevant for process specialists

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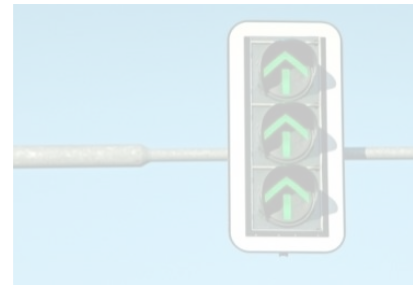
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