



Technology with Vision

HELLA GmbH & Co. KGaA

Company Presentation

FY 2017/18



Disclaimer

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This document contains an English translation of the accounts of the Company and its subsidiaries. In the event of a discrepancy between the English translation herein and the official German version of such accounts, the official German version is the legal valid and binding version of the accounts and shall prevail.

HELLA Company Presentation FY 2017/18

Outline

- HELLA Financial Results FY 2017/18
- HELLA at a Glance
- HELLA's view on Automotive Market Trends

Positive sales growth and EBIT increase in FY 2017/18

Financial Highlights FY 2017/18

Sales

- **HELLA Group** currency adjusted **sales grew by 9.3% YoY** to 7.1 bill. EUR

Profitability

- **Adjusted Gross Profit margin** at **27.9%** (+0.4%-points YoY)
- **Adjusted EBIT** +47 mill. EUR (+8.8% YoY) at **581 mill. EUR**
- **Adjusted EBIT margin** +0.1pp to **8.2%**

Liquidity

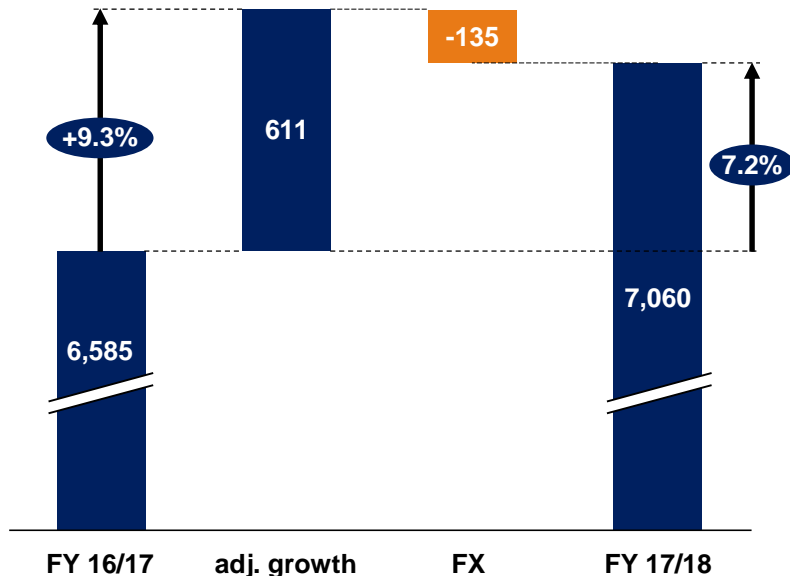
- **Adjusted Free Cash Flow from operating activities** increased by **92 mill. EUR** (+62% YoY) to **241 mill. EUR**

Note: Adjustments of profitability figures include restructuring expenses in Germany and in previous years adjustment for provision in context with the EU cartel proceeding. Please note that where sums and percentages in the presentation have been rounded, differences may arise as a result of commercial rounding.

HELLA top line growth with strong development in FY 17/18

Financial Highlights FY 2017/18

HELLA Group sales (EUR millions)



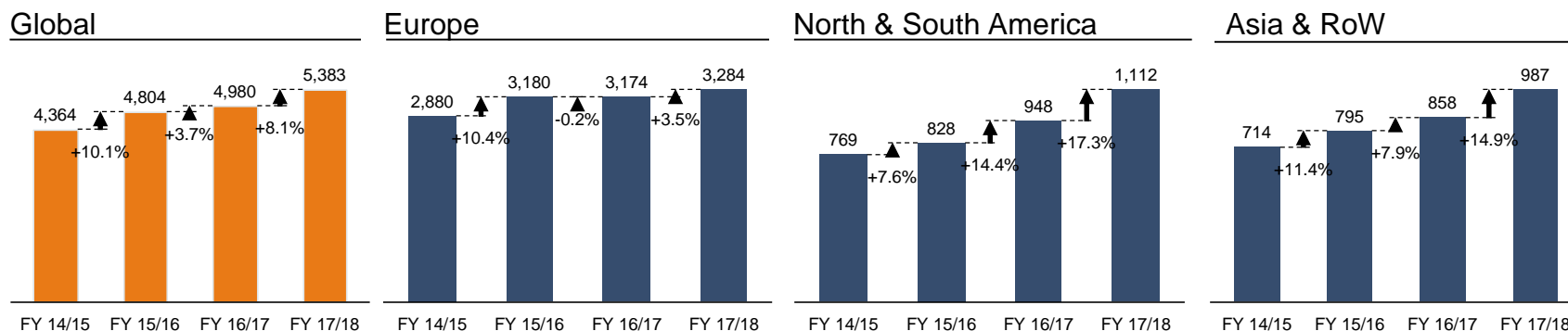
Comment

- **Currency adjusted growth HELLA Group at 9.3%**
- **Reported sales growth HELLA Group at 7.2% (increased by 476 mill. EUR to 7,060 mill. EUR)**
 - **Automotive +8.0% to 5,433 mill. EUR.** Demand for **energy management products, radar solutions** and **advanced lighting systems** drives business
 - **Aftermarket external sales +3.4%, positive** demand from Independent Aftermarket and Wholesale as well as Workshop business in H2 FY 17/18
 - **Special Applications +11.6% to 430 mill. EUR,** positive development in agriculture and construction

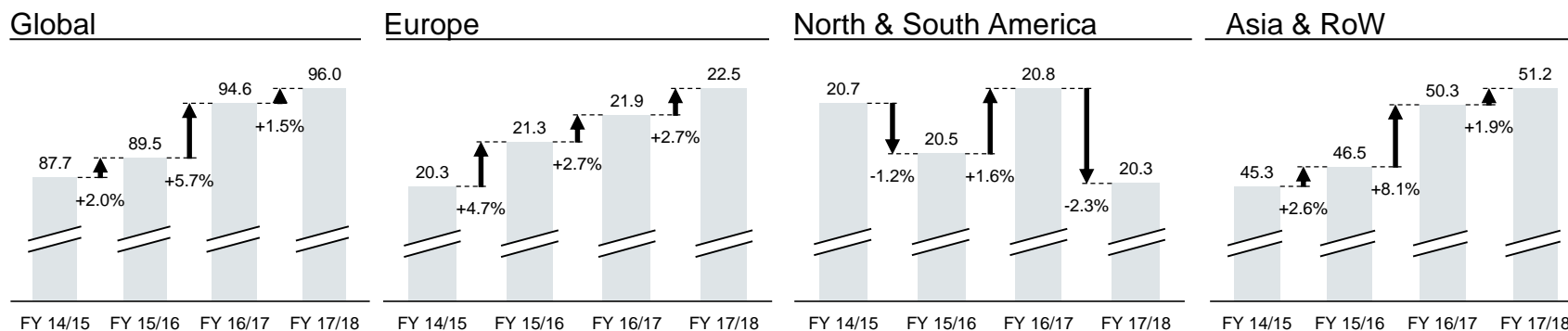
HELLA Automotive outperforming all important regions

Financial Highlights FY 2017/18

HELLA Automotive external sales by region (in EUR millions)



Light vehicle production (in million units)



HELLA Automotive growth vs. market (Light vehicle production growth):

+8.0% -2.0% +6.6%

+5.7% -2.9% +0.8%

+8.9% +12.8% +19.6%

+8.7% -0.2% +13.0%

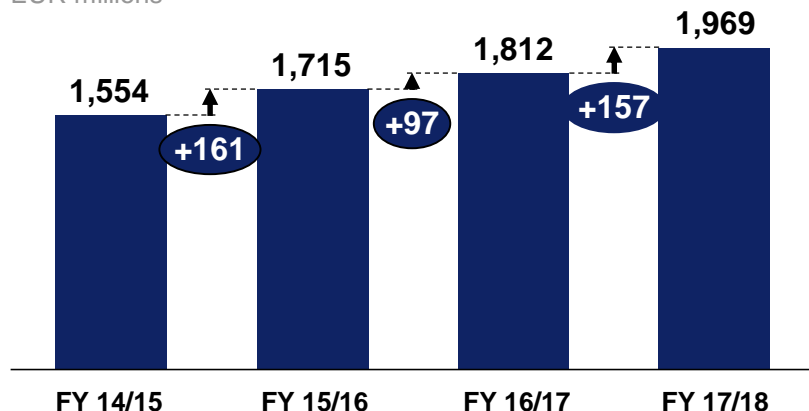
Source: HELLA; IHS (as of July 2018)

GPM increase due to strong overall business development

Financial results FY 2017/18

Adj. Gross Profit

EUR millions

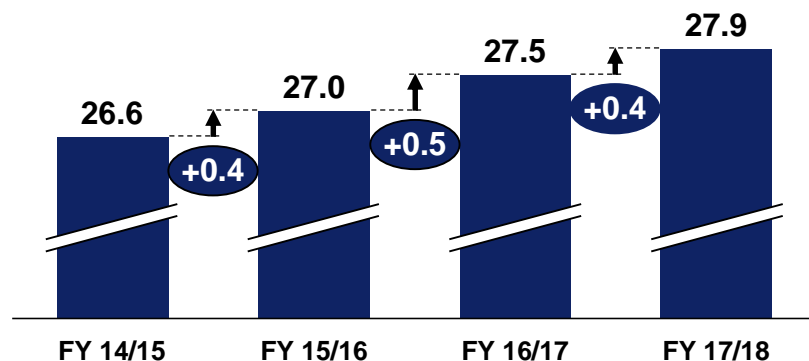


Highlights

- **Adj. Gross Profit** increased by 157 mill. EUR (+8.7%) to 1,969 mill. EUR
 - **Automotive** +8.6% to 1,387 mill. EUR
 - **Aftermarket** +2.7% to 429 mill. EUR
 - **Special Applications** +23.5% to 153 mill. EUR

Adj. Gross Profit margin

% sales



Highlights

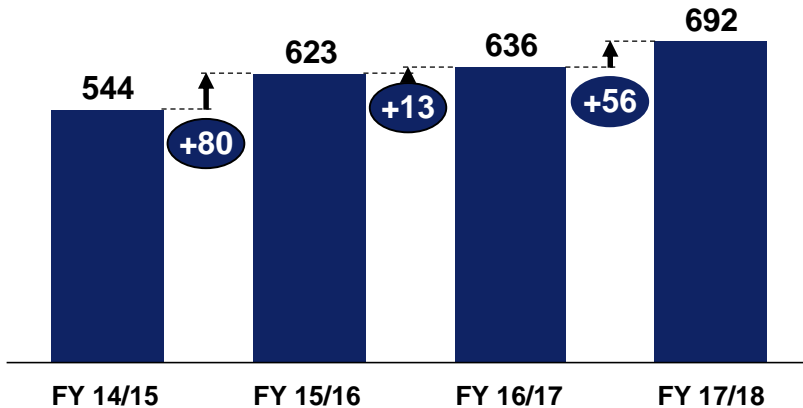
- **Adj. Gross Profit margin** improved by 0.4%-points to 27.9%
 - higher production volume in Automotive and higher associated utilization with positive effects on GPM, ongoing capacity increases still a burden
 - increased margins in Aftermarket and Special Applications

Continuous high R&D expenses to secure future growth and to support production ramp-up

Financial results FY 2017/18

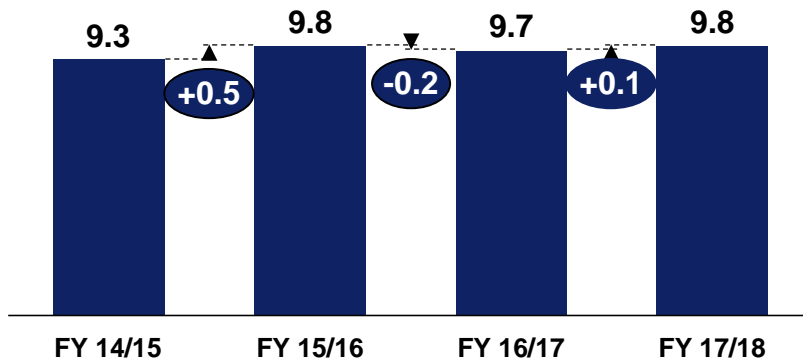
R&D expenses

EUR millions



R&D expenses ratio

% sales



Highlights

- **Absolute R&D** expenses increased by 56 mill. EUR (+8.8% YoY) to **692 mill. EUR**, mainly:
 - Secure and strengthen technology leadership along the market trends
 - Preparation and realization of production ramp-ups
 - Investments in international R&D capacities

Highlights

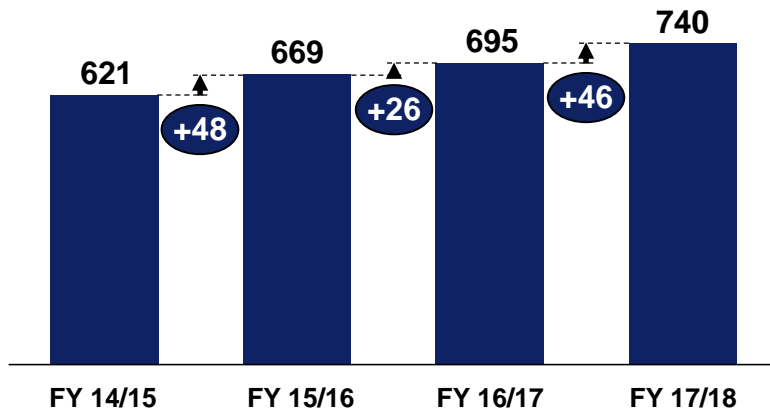
- **FY 17/18** ratio +0.1pp to **9.8%** due to high level of absolute R&D expenses

Relatively stable development of SG&A costs

Financial results FY 2017/18

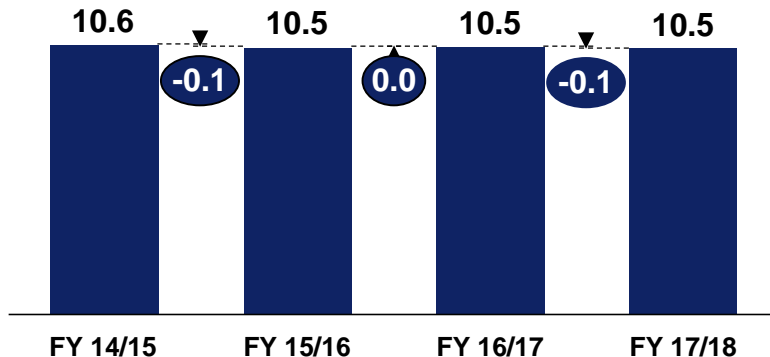
Adjusted SG&A expenses

EUR millions



Adjusted SG&A expenses ratio

% sales



Highlights

- **Adj. SG&A costs** increased under-proportionally (+46 mill. EUR, +6.6%) to 740 mill. EUR
- Under-proportional increase in distribution expenses (+3.3%)
- Under-proportional increase in administration expenses (+5.2%) but continuous investments in processes, systems and functions

Highlights

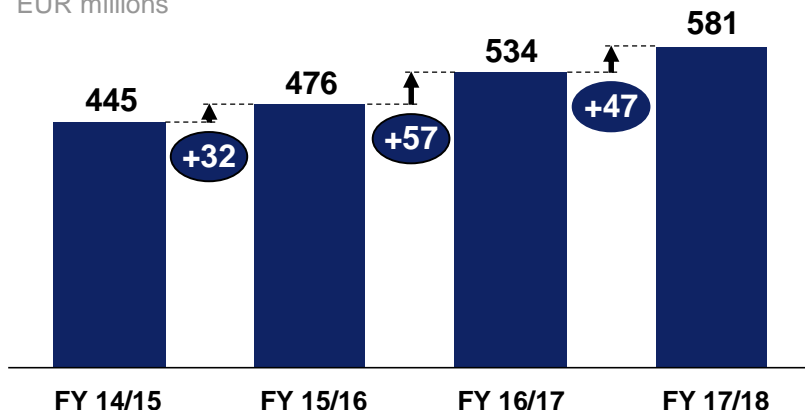
- **Adj. SG&A ratio stable** at 10.5%, ratio of structural costs in general with relatively stable development. Improvement through a decline in distribution cost ratio by 0.3pp to 7.4%
- Adj. other income & expenses -0.3pp to 0.3%

Adjusted EBIT and EBIT margin above prior-year's level

Financial results FY 2017/18

Adjusted EBIT

EUR millions

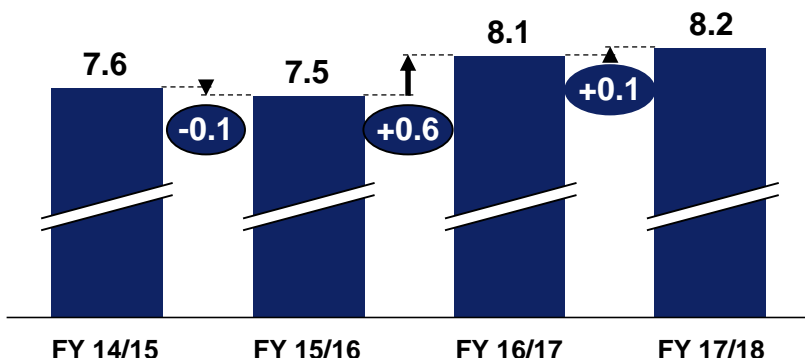


Highlights

- **Adj. EBIT** increased by 47 mill. EUR (+8.8%) to **581 mill. EUR**, mainly:
 - increase in adj. Gross Profit by 157 mill. EUR (+8.7%)
 - higher R&D (+56 mill. EUR, +8.8%)
 - decline in JV income by 8 mill. EUR (-15%)

Adjusted EBIT margin

% sales



Highlights

- **Adj. EBIT margin** increased by **0.1%-points** to **8.2%**:
 - increase of adj. GPM by 0.4pp
 - higher R&D expenses ratio (-0.1pp)
 - decreased contribution of JV (-0.2pp)

P&L including reconciliation

Financial results FY 2017/18

FY comparison

HELLA GROUP

in EUR mill.

		FY 16/17	FY 17/18
Gross Profit	reported	1,812.0	1,966.3
	Adjustments	0.0	2.6
	adjusted	1,812.0	1,968.9
Other income and expenses	reported	15.0	20.5
	Adjustments	26.4	3.9
	adjusted	41.4	24.3
EBIT	reported	507.2	574.3
	Adjustments	26.4	6.5
	adjusted	533.6	580.8
Net financial result		-44.2	-44.1
Taxes		-119.8	-140.1
Earnings for the period		343.1	390.1
Earnings per share (EUR)		3.08	3.50

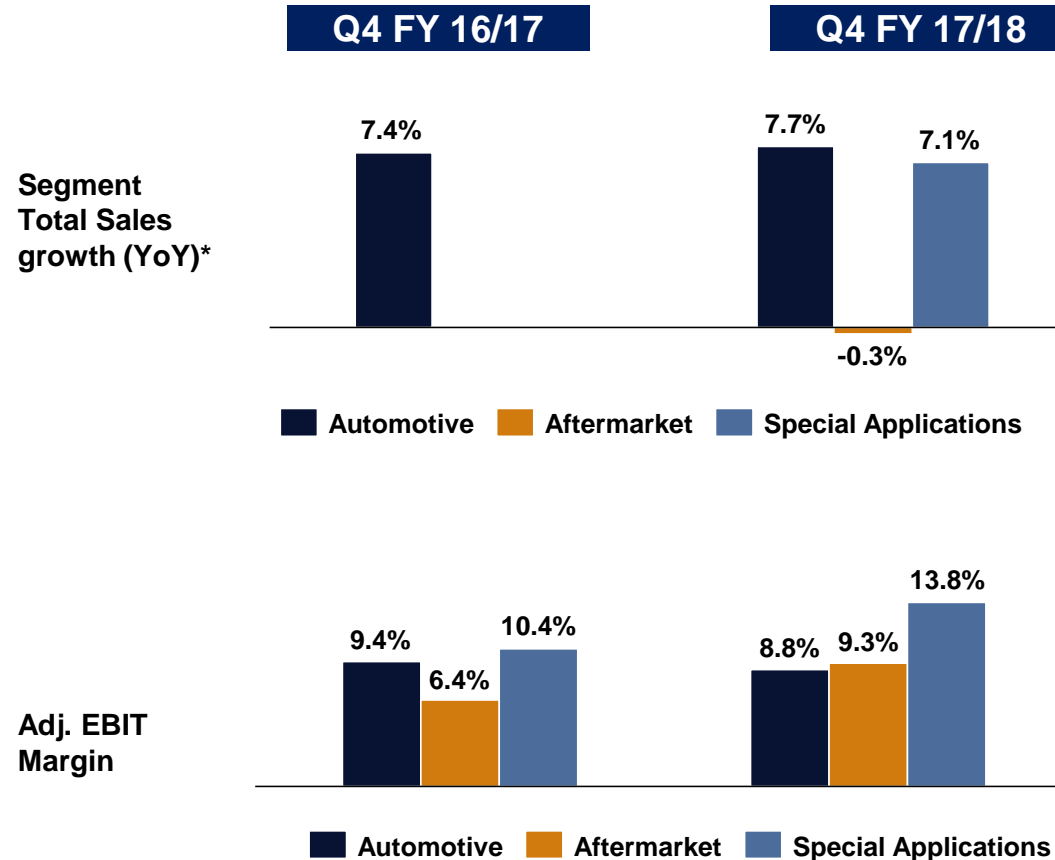
Comments

- Reported EBIT FY 17/18 increased by 67 mill. EUR (+13.2%) to 574 mill. EUR, EBIT only slightly negatively impacted by restructuring expenses in Germany
- Net financial result decreased slightly after local financing in Mexico
- Earnings for the period increased driven by operational improvements and lower one-offs
- Result driven higher tax payments, tax rate at 26.4%, excl. JVs at 28.8%, slightly improved vs PY
- EPS increased by 42 Cent (+14%) to 3.50 EUR

Q4 FY 17/18 with stronger profitability in all segments

Financial results FY 2017/18

Quarterly comparison



Comments

- Q4 FY 17/18 reported Automotive sales influenced by FX headwind; in Q4 FY 16/17 catch-up effect and positive FX influence
- Aftermarket with negative sales growth, external sales +2.1% driven by Wholesale and Workshop business
- Special Applications with strong agricultural & construction business and over-proportional demand in Australia
- Q4 FY 17/18 Automotive EBIT affected by lower GPM
- Aftermarket adjusted EBIT margin up after pre-investments in Wholesale and Workshop business
- Q4 FY 16/17 Special Applications with 2.6 mill. EUR negative effects from Industries and Airport Lighting disposal

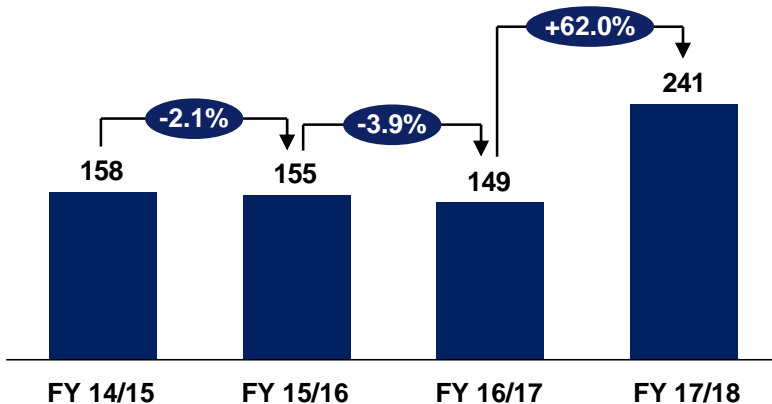
* Q4 FY 16/17 Aftermarket and Special Applications not available due to change in segment reporting

Adj. Free Cash Flow from operating activities increased due to higher funds from operations

Financial results FY 2017/18

Adj. FCF from operating activities

EUR millions



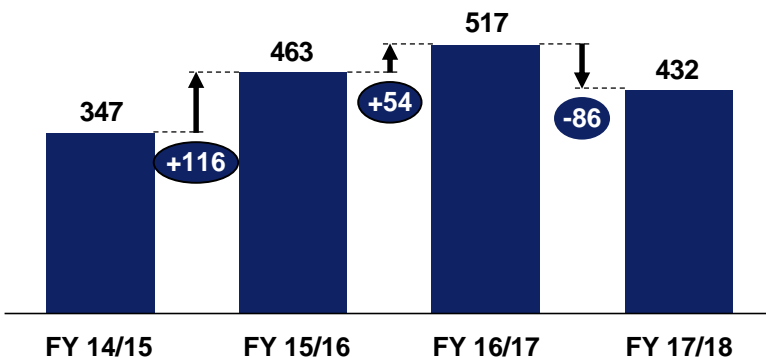
Highlights

- **Adj. Free Cash Flow from operating activities** increased by 92 mill. EUR to **241 mill. EUR**, mainly due to **increased funds from operations** and **lower Net CAPEX**
- **Cash Conversion*** ratio increased by 13.6pp to **41.6%**

*Note: Adj. Free Cash Flow from operating activities / adj. EBIT

Net CAPEX

EUR millions



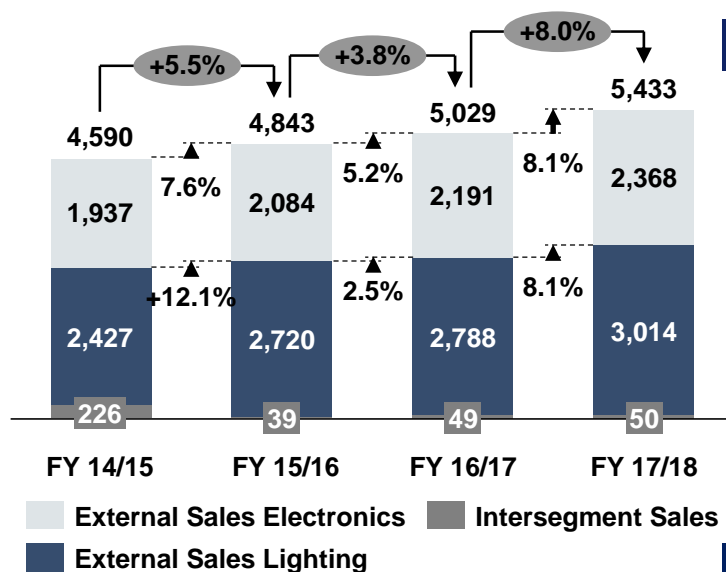
Highlights

- Net CAPEX decreased by 86 mill. EUR to **432 mill. EUR**
- Continuous high **investments** in customer-specific **equipment** and **capacity extensions**
- **Reimbursements** increased by 45 mill. EUR to **176 mill. EUR** depending on project launches

Note: Adjustments of FCF include restructuring expenses, factoring (FY 16/17 only) and adjustment for cash payments in context with the EU cartel proceeding (FY 17/18 only)

Automotive segment with increasing growth

Financial results FY 2017/18

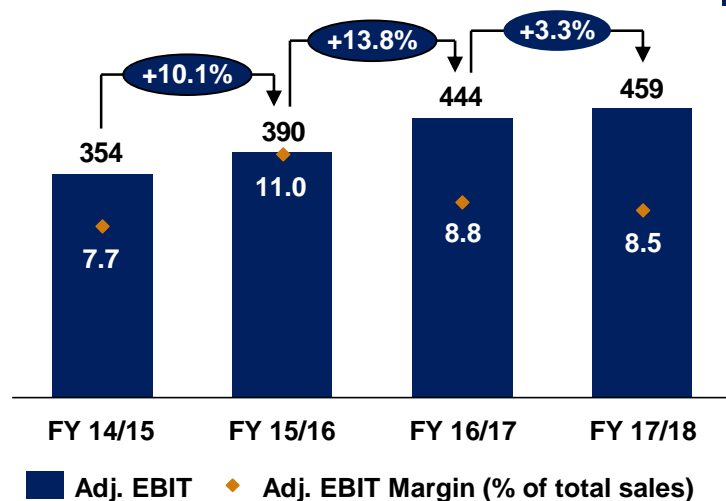


Automotive Sales

- **Growth of 8.0%** with ongoing production **ramp-ups** and **higher demand** for:
 - **energy management** and **driver assistance products**
 - **innovative / advanced lighting products**
 - Demand driven by **NSA, China** and **Europe** (ex. Germany)

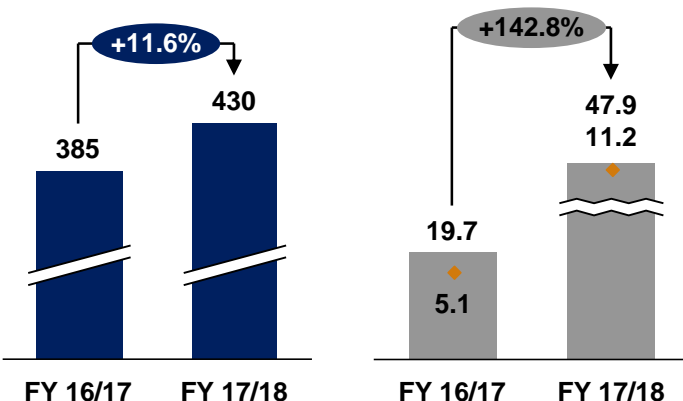
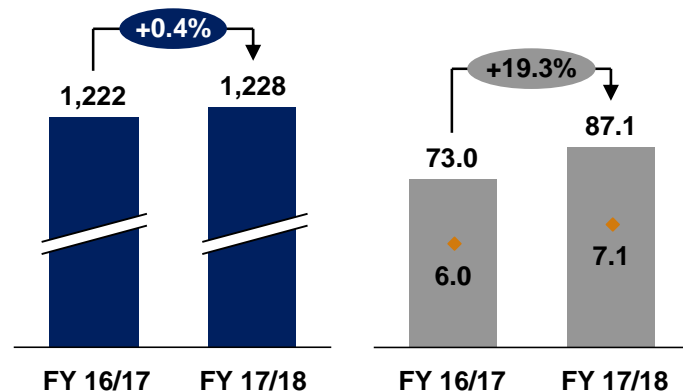
Automotive Profitability

- **Increase of adj. EBIT by 3.3%** to **459 mill. EUR**:
 - **ongoing capacity increase** with initially **lower utilization**; **increase in volume** and **higher utilization** of capacities since Q2
 - **lower JV contribution**; weakness in Asian JVs
 - **increase in R&D** to prepare production ramp-ups and expand the international **R&D** network
 - higher SG&A with investments in corporate functions
 - negative FX effect



Non Automotive segments with positive contributions

Financial results FY 2017/18



■ Total Sales

■ EBIT

◆ EBIT Margin

Aftermarket

- **External sales growth (+3.4%)** due to **positive IAM and wholesale** business, workshop catching up in H2, total sales grew slightly by 0.4% due to loss of intercompany business
- **Increase in EBIT margin by 1.1pp to 7.1%**, increase in GPM (+0.8pp) and lower administration ratio (-0.4pp to 1.6%)

Special Applications

- **Strong top-line growth (+11.6%):**
 - increasing demand in **Agricultural** and **Construction** sector
 - other product groups e.g. **Trailer** and **Trucks** also **growing**
 - **over-proportional** growth in **Australia**
- **Massive profitability increase (~143%)**
 - strong top line growth
 - **negative effects** from the sale of **Industries & Airport lighting** activities in **FY 16/17**

Overall market FY 18/19 expected to grow by 2.7% according to IHS Outlook

Region	Expected LVP (in m units)	Comment
Europe	<div>+0.9%</div> <div>22.7</div> <div>FY 18/19</div>	<ul style="list-style-type: none"> Continued modest growth in 2018/19 expected. Europe excluding Germany expected to grow slightly by 1.4% to 16.9m units, Germany with an expected decline of 0.4% to 5.7m units
NSA	<div>+4.8%</div> <div>21.3</div> <div>FY 18/19</div>	<ul style="list-style-type: none"> After negative previous year (-2.3%), strong growth in 2018/19 expected
China	<div>+4.2%</div> <div>29.2</div> <div>FY 18/19</div>	<ul style="list-style-type: none"> China expected to grow stronger in 2018/19, Asia/RoW expected to grow by 2.9% to 52.7m units
Global	<div>+2.7%</div> <div>98.6</div> <div>FY 18/19</div>	<ul style="list-style-type: none"> Overall market expected to grow by 2.7%

Source: IHS (as of July 2018)

Company specific development for FY 2018/19 continuously positive

Guidance

Presuming no serious political, economic or social crises, we expect a positive business development for the HELLA Group in fiscal year 2018/19:

Sales growth

- Growth excluding FX and portfolio effects between 5-10%

Adj. EBIT growth

- Growth excluding restructuring and portfolio effects between 5-10%

Adj. EBIT margin

- Margin excluding restructuring and portfolio effects approximately equivalent to prior year's level

HELLA Company Presentation FY 2017/18

Outline

- HELLA Financial Results FY 2017/18
- HELLA at a Glance
- HELLA's view on Automotive Market Trends

As one of the top 40 automotive suppliers worldwide HELLA specializes in innovative lighting systems and vehicle electronics

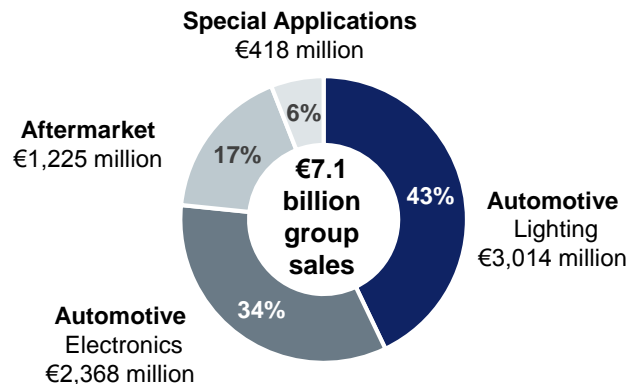
HELLA at a Glance – Overview

KEY FACTS

- **Founded 1899** in Lippstadt (Germany)
- Global footprint with over **40,000 employees** at more than **125 locations** in some **35 countries**
 - Thereof **41 research & 28 production sites**
- Integrated business portfolio in **Automotive, Aftermarket, and Special Applications**
- **Leading market positions** in automotive **Lighting and Electronics**
- One of the **top 40 automotive suppliers** in the world and one of the **100 largest German industrial companies**

SALES BY BUSINESS SEGMENT

external sales, fiscal year 2017/18



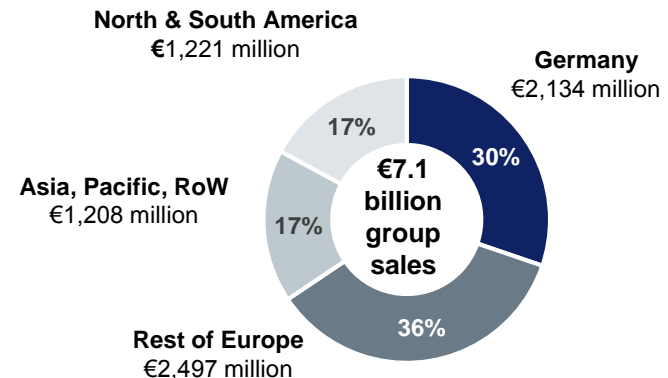
KEY FINANCIALS

in EUR millions and % of sales

	FY 2016/17	FY 2017/18	Change
Sales	6,585	7,060	+7.2%
Adjusted EBIT	534	581	+8.8%
Adjusted EBIT margin	8.1%	8.2%	+0.1% points
Adjusted Free Cash Flow	149	241	+61.7%

SALES BY REGION

based on the HQs of HELLA's customers, fiscal year 2017/18

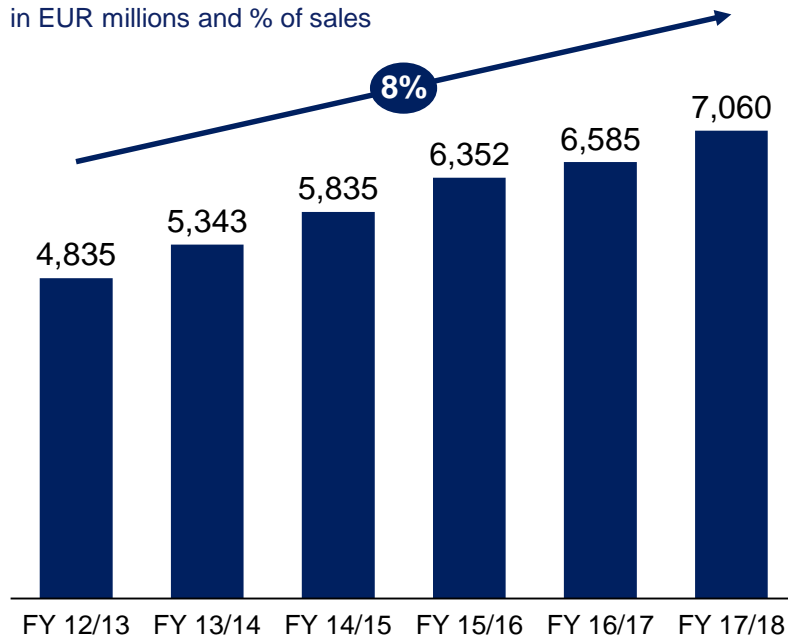


HELLA has shown sustainable profitable growth since automotive crisis

HELLA at a Glance – Sales and EBIT development

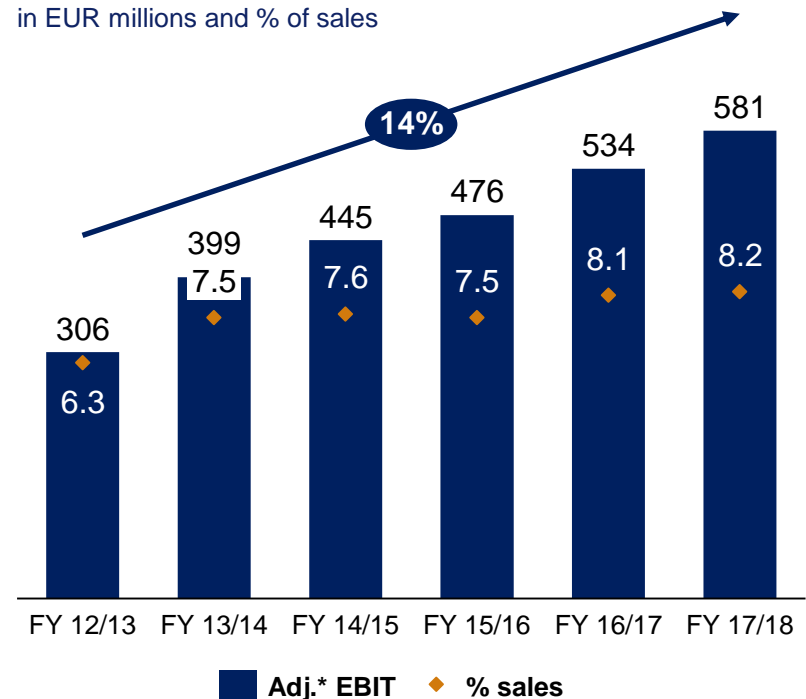
SALES

in EUR millions and % of sales



ADJUSTED EBIT

in EUR millions and % of sales

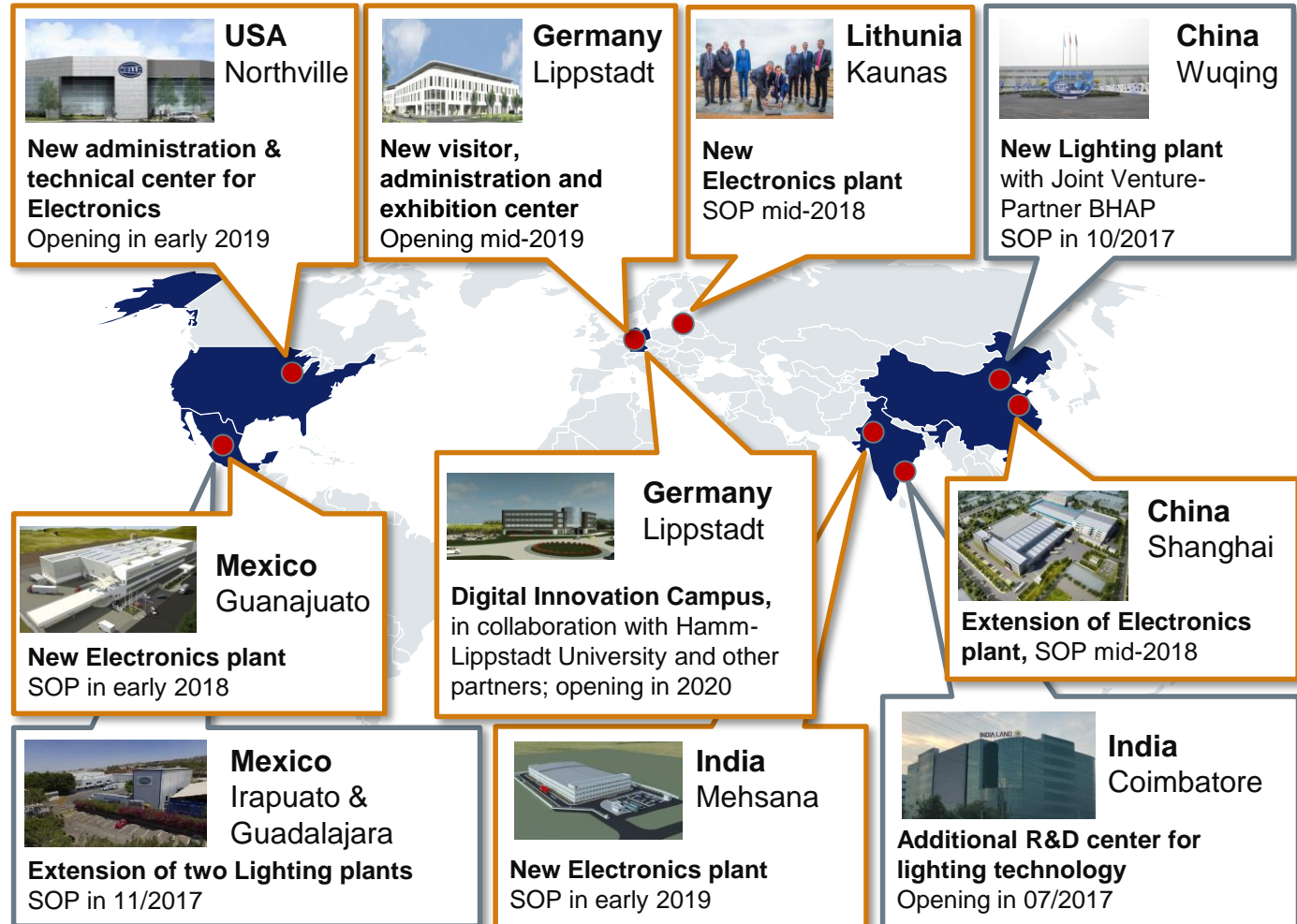


- **Sustainable growth** during the last years mainly driven by **Automotive**
- **Aftermarket** and **Special Applications** also with positive **growth**
- **Continuous EBIT increase** despite large investments in **global structures** and **R&D**
- **Overall stable margin level** through **growth** driven by **technology leadership** and **increased efficiency**

To further secure profitable growth path HELLA continuously expands its global footprint

HELLA at a Glance – Footprint

GLOBAL FOOTPRINT



Recent openings since mid 2017

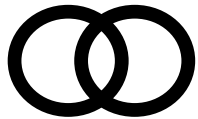
Outlook













SOP: Start of production

To secure profitable growth path HELLA has further developed its well-established partner network

HELLA at a Glance – Partnership Network

PARTNERSHIP NETWORK



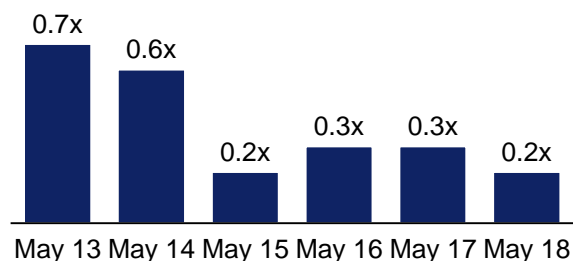
TREND	Partnership examples	Kind of partnership	FOCUS
 AUTONOMOUS DRIVING		Open Cooperation	Development and marketing of modern assistance systems and autonomous driving functions
		Open Cooperation	Radar-based system technologies by combining radar sensors from HELLA and radar system chips from NXP
		Joint Venture	Development of radar systems ; InnoSenT exclusively sells all products and services in its automotive portfolio to HELLA
 EFFICIENCY & ELECTRIFICATION		Open Cooperation	Development of innovative electric actuating solutions ; first joint project will be the production of an electric purge pump significantly reducing CO2 emissions
 CONNECTIVITY & DIGITALIZATION		Open Cooperation	Development of a cloud-based air quality management system
		Seed Investment	Innovative software solution for cloud-based communication of vehicle data to workshops
 INDIVIDUALIZATION		Joint Venture	Development of individualized HMI concepts , e.g. innovative touch displays & gesture control devices
		Joint Venture	Design, development, production and logistics of individualized, integrated front-end modules

High financial stability ensures long-term growth perspective and provides freedom for entrepreneurship

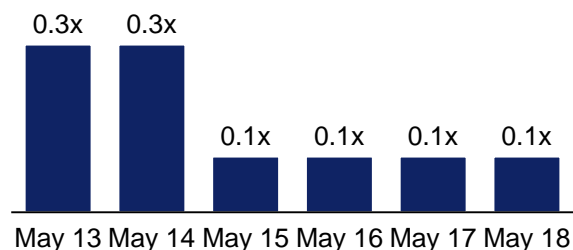
HELLA at a Glance – Financial Stability

Solid capital structure

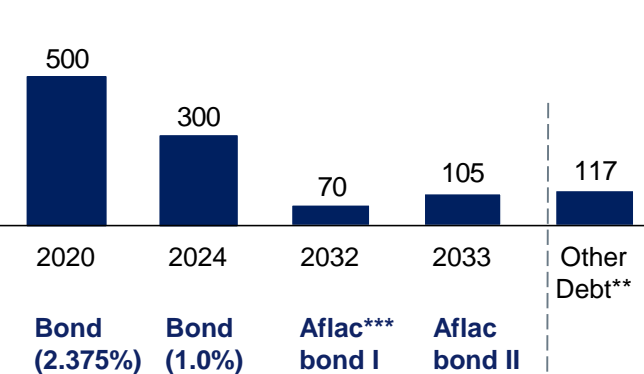
Leverage (Net debt / EBITDA)



Gearing (Net debt / Equity)



Debt and maturity profile*, in millions EUR



Additional Revolving Credit (2022) of EUR 450m with 10 core banks as back-up facility

Strategic flexibility

HELLA has a stable and solid financial fundament which forms the basis for its future strategic plans

- Prudent financial policy throughout the cycle with leverage < 1.0x
- Financing of long-term growth strategy secured
- Well balanced debt portfolio
- New issuing (senior, unsecured / bearer debt) for attractive conditions
- Mid term target: Leverage < 1.0x

- Capital-market-oriented capital structure with investment grade rating
- **Good liquidity profile** and consistent liquidity management
- **EUR 102m dividends** (0.92EUR/share) paid October 2017
- **Equity ratio at 41.9% and cash & assets at 1,021 mill. EUR**

* As of August, 2017; Euro Bond I: 1,15%, Euro Bond II: 2,375%, Euro Bond III: 1.00% ; Aflac bonds hedged values ** Mostly short term loans and evaluation impact

*** Abbreviation for "American Family Life Insurance Company"

In the Automotive segment, HELLA develops and produces innovative solutions for automobile manufacturers worldwide

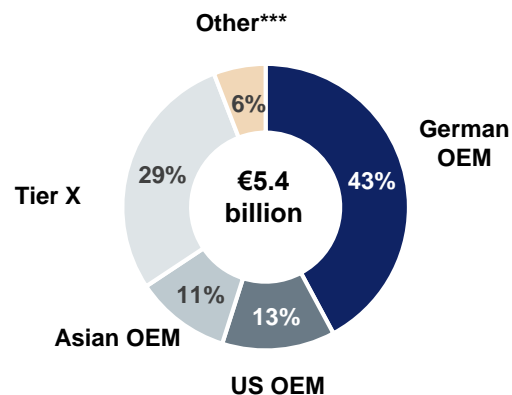
HELLA at a Glance – Business Segment Automotive

BUSINESS OVERVIEW*

Lighting <ul style="list-style-type: none"> ▪ Headlamps ▪ Rear Combination Lamps ▪ Small Lamps ▪ Interior Lighting ▪ Lighting Electronics 	<ul style="list-style-type: none"> ▶ #1 market position in LED headlamps Europe ▶ #3-4 global and #1-2 European market position in OE passenger car lighting
Electronics <ul style="list-style-type: none"> ▪ Components ▪ Energy Management ▪ Driver Assistance Systems ▪ Body Electronics ▪ Steering 	<ul style="list-style-type: none"> ▶ #2-3 global and #1-2 European market position in defined automotive electronic segments

AUTOMOTIVE SALES BY CUSTOMERS

fiscal year 2016/17



*) All figures related to the selected markets and product categories based on HELLA's portfolio, as covered in an external market study commissioned by HELLA (2014)

**) Adjustments including restructuring expenses

***) Including European OEM (ex Germany) and trucks.

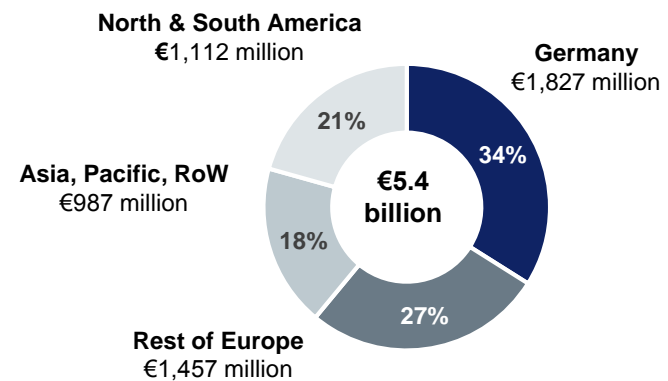
KEY FINANCIALS

in EUR millions and % of sales

	FY 2016/17	FY 2017/18	Change
External Sales	4,980	5,383	+8.1%
Adjusted EBIT**	444	457	+2.8%
Adjusted EBIT margin**	8.8%	8.5%	-0.3% points
Ext. Sales Lighting	2,788	3,014	+8.1%
Ext. Sales Electronics	2,191	2,368	+8.1%

AUTOMOTIVE SALES BY REGIONS

fiscal year 2017/18



HELLA will benefit in its core business thanks to favorable positioning along major automotive market trends

HELLA at a Glance – Automotive Technology Highlights

MAJOR AUTOMOTIVE MARKET TRENDS

AUTONOMOUS DRIVING



EFFICIENCY & ELECTRIFICATION



CONNECTIVITY & DIGITALIZATION



INDIVIDUALI- ZATION



Selected Examples

Electronic portfolio



Camera
Software



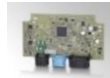
77 GHz
Radar Sensor



48V
DC/DC-
Converter



Purge
Pump



Battery
Mgmt.
System

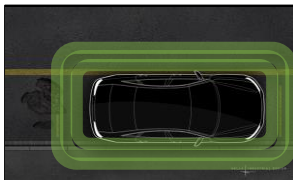


Particulate
Matter Sensor



Passive
Entry System

Lighting portfolio



Driving Status
Projections



LED Technology



High Definition
headlamp



Ambient & Relaxing
Interior lighting



HELLA has one of the largest retail organizations for automotive parts, accessories, diagnostics, and services within Europe

HELLA at a Glance – Business Segment Aftermarket

BUSINESS OVERVIEW






Independent Aftermarket (IAM)

- Sale of **own and third-party spare parts** to IAM wholesalers
- **Own sales presence** in >25 countries
- **Strong position** of sales network and brand presence in **European market (#1-3)**







Wholesale Distribution

- Building **holistic product portfolio** from part suppliers and **offering to IAM garages**
- **Market position: #1**  **#2**  **#3** 
- **Synergies through** HELLA wholesale organization “**Nordic Forum**”



Workshop Equipment

- Premium provider of **workshop solutions, diagnostic tools** and advanced **equipment** to garages
- Offering of **professional services**, e.g. technical data/hotline, trainings & financial services
- **market position: #1**    **#3** 

KEY FINANCIALS

in EUR millions and % of sales

	FY 2016/17	FY 2017/18	Change
Sales	1,222	1,228	+0.4%
EBIT	73.0	87.0	+19.3%
EBIT margin	6.0%	7.1%	+1.1% points
Sales IAM	553	568	+2.7%
Sales Wholesale	550	580	+5.5%
Sales Garage Equipment	66	67	+2.6%

STRATEGIC FOCUS

- **Further strengthen IAM product portfolio**
e.g. enhance offering of Electronics/ Electrics and universal lighting products, expand partner network, push roll-out of 3rd party products to additional markets
- **Further enhance workshop products and services**
e.g. set-up new digital offers and software driven business models (remote fleet manager, workshop broker platform), develop calibration solutions for complex cars
- **Refine wholesale distribution strategy**
e.g. roll out of digital service platform in Norwegian market, push wholesale business in Poland

New high end diagnostic device mega macs 77 enables fast trouble code reading and interpretation as well as other features

HELLA at a Glance – Aftermarket Technology Highlight

New diagnostic device
for workshops:
mega macs 77



VALUE PROPOSITION: HIGH-END TECHNOLOGY COMBINED WITH USER GUIDANCE

- **Successor product** of the diagnostic unit which is **market leading** in the DACH region
- **Higher usability** through Full HD 15.6" touchscreen and refined user interface
- **Real-time-repair concept** making daily workshop business faster and therefore more profitable
- Further step towards **fully guided repair**: step by step instructions and guided measurement with automated verification of results
- **Reduction of errors** through automatic VIN-identification with automated link to parts catalogue

OUTLOOK

- **International roll-out started** in March 2018
- mega macs 77 hardware and software **architecture as platform for further products**
- **Next-generation software at Automechanika 2018**, taking guided repair another step forward

In Special Applications HELLA incorporates the extensive technological expertise in lighting and electronics

HELLA at a Glance – Business Segment Special Applications

BUSINESS OVERVIEW

- Development, production and sale of **lighting and electronics products for special vehicle manufacturers**
- **“Fast follower” of technological innovations in automotive segment** along megatrends LED, energy efficiency and safety
- Application of know-how through **own research and development resources** and **dedicated production footprint**
- **Strong market position in lighting product** areas based on long-standing experience, in particular in Europe
- Focusing on **a variety of attractive target groups**

TARGET GROUPS



KEY FINANCIALS

in EUR millions and % of sales

	FY 2016/17	FY 2017/18	Change
Sales	385	430	+11.6%
EBIT	19.7	48.0	+143.7%
EBIT margin	5.1%	11.2%	+6.1% points

STRATEGIC FOCUS

- **Drive further LEDfication**
e.g. build-up competences in intelligent lighting solutions, push Visiotech technology, broaden innovative roadmap (LED matrix beam, Shapeline), increase number of vehicle specific lighting projects
- **Boost growth of Electrics / Electronics business**
e.g. extend electronics scope (focus on sensors and actuators), foster cooperation and M&A opportunities
- **Penetrate growing customer segments**
e.g. drive growth in segments mining, power sports, and marine, push solutions for e-cars and small cars, explore further growth potential of truck business

Innovative HELLA technologies for special vehicles increase workplace safety, the operator's comfort and individualization

HELLA at a Glance – Special Applications Technology Highlight

Innovative projection system for special purpose vehicles: „VISIOTECH“



VISION

- Increasing workplace safety and the operator's comfort
- Visually warn or alert other vehicles or passersby
- Lead customer (Projection Module):
LINDE (triangle symbol with a forklift)

Module 50 Spot



- Creates a bright warning spot on the ground



SL60 LED



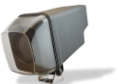
- Creates a line on the ground
- Customization option:
Add a customer logo on the backside of the lamp



Projection Module



- Projects exclamation mark as warning symbol
- Perfect view even under daylight conditions
- Other symbols / working area warning projections possible











HELLA Company Presentation FY 2017/18

Outline

- HELLA Financial Results FY 2017/18
- HELLA at a Glance
- HELLA's view on Automotive Market Trends

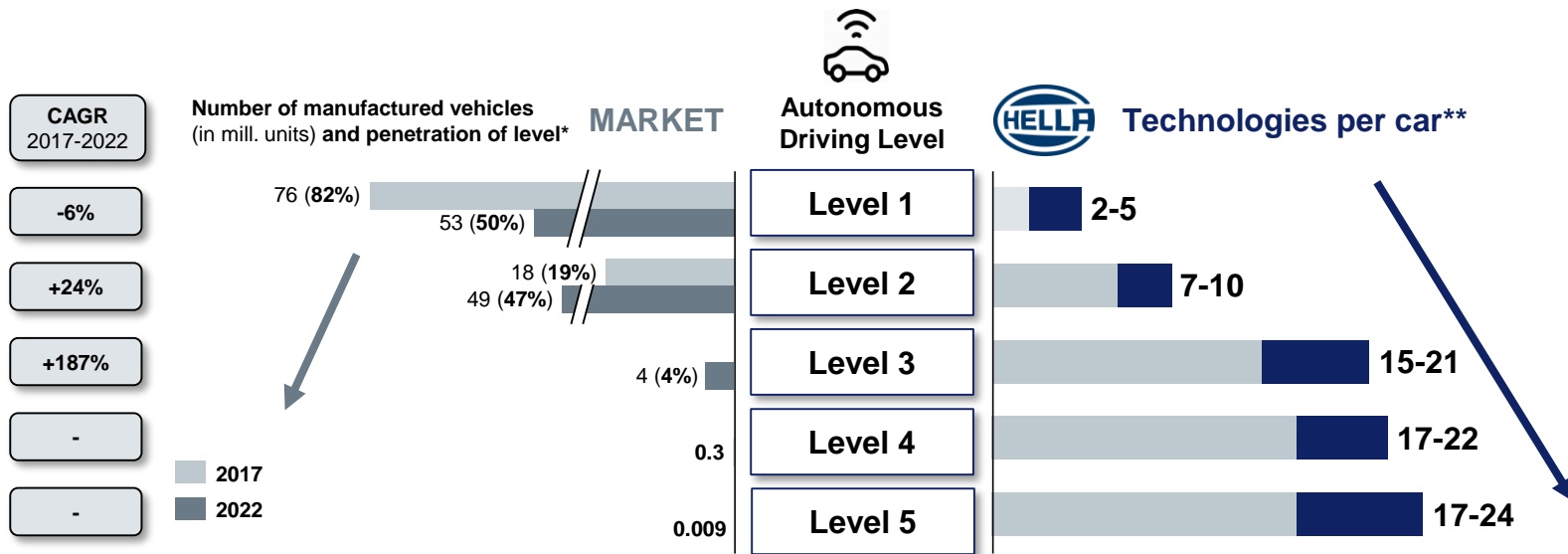
To benefit from latest market developments, HELLA has incorporated their major implications into its strategic action plan

HELLA's view on Automotive Market Trends

 AUTONOMOUS DRIVING (AD)	 EFFICIENCY & ELECTRIFICATION	 CONNECTIVITY & DIGITALIZATION	 INDIVIDUALIZATION
<ul style="list-style-type: none">▪ Safety regulations (NCAP) are pushing AD level 1-3▪ Increasing number of partnerships for AD level 4-5▪ Higher willingness of consumers to pay for AD features	<ul style="list-style-type: none">▪ Accelerated penetration of electrified vehicles due to incentives and regulatory push▪ Especially increasing demand for mild-hybrid solutions▪ Strong growth in China	<ul style="list-style-type: none">▪ Increasing importance of software: Increase in functionalities with car value shift from hardware to software▪ 75% of vehicles estimated to have internet connection by 2020	<ul style="list-style-type: none">▪ Stronger focus of OEMs and consumers on vehicle design features▪ Increasing demand for passenger related applications and functionalities
 Major implication <ul style="list-style-type: none">➤ Increasing relevance of system competence and partnerships	 Major implication <ul style="list-style-type: none">➤ Substantial growth opportunities for HELLA (worldwide, but especially in China)	 Major implication <ul style="list-style-type: none">➤ New business opportunities e.g. cloud-based solutions, domain computer, digital aftermarket solutions	 Major implication <ul style="list-style-type: none">➤ Additional growth opportunities for HELLA especially in the field of interior and car body lighting

For continuous organic growth, HELLA offers sensors and software for the road to autonomous driving

HELLA's view on Autonomous Driving



MARKET Development

- **Strong ADAS penetration increase** especially coming from L2-3 with a CAGR of 26% (2017-2022), radar, camera and Lidar as strongest drivers
- **ADAS sensors demand increasing globally**, existing driver assistance functions are key enablers for automated driving
- **AD L4 and L5 functionalities important beyond 2022**, penetration increase of L5 starting 2025

HELLA Position

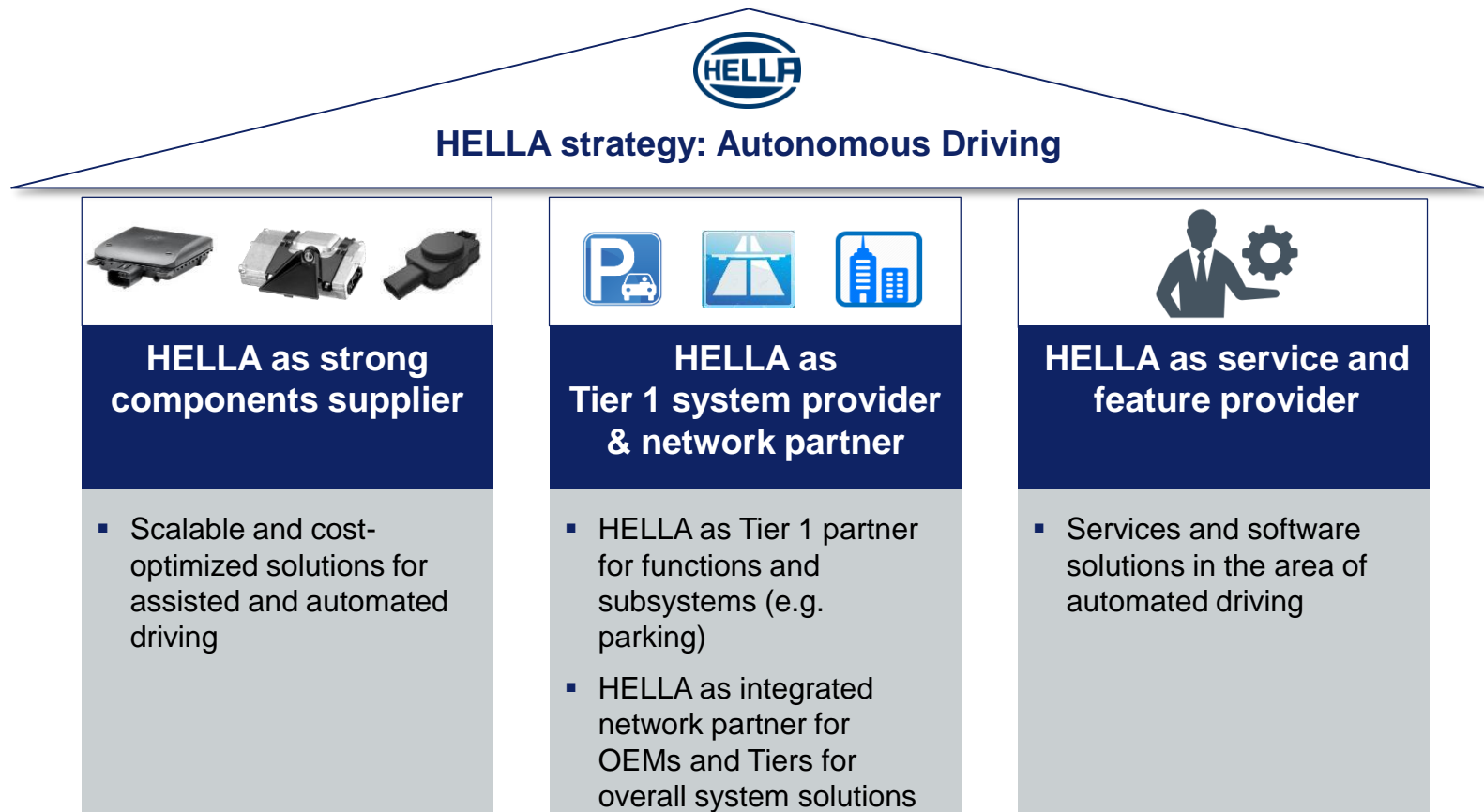
- **Enable the transition to increased automation as key supplier of ADAS**, as strong component and (sub-) system supplier
- **Thorough allocation of development resources** to continuously increase radar share and penetrate camera software market
- **Develop new functionalities and use cases** from assisted to automated driving

* Based on global LVP, source: IHS, Strategy Analytics, HELLA analysis

** Includes radar sensors (24 GHz and 77 GHz), front camera software functionalities (traffic sign, lane, light, object detection), LIDAR, and SHAKE. Potential # of sensors includes redundancies

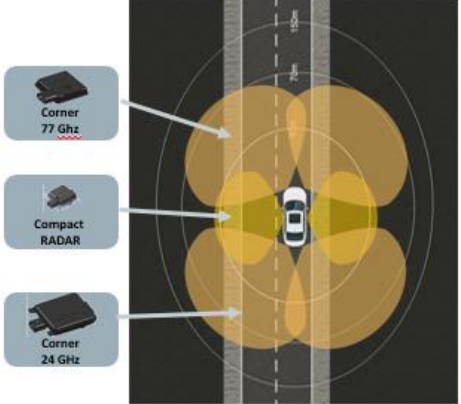
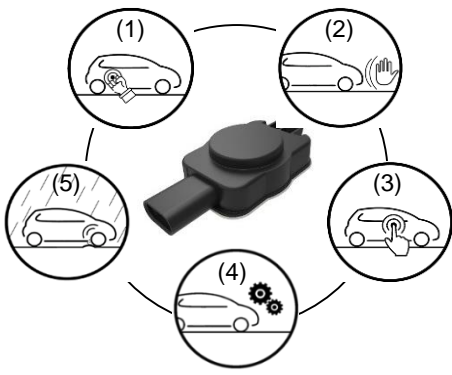

To seize business potentials from Autonomous Driving, HELLA pursues a strategic approach based on three essential pillars

HELLA's view on Autonomous Driving – Strategic approach



HELLA offers scalable and cost-optimized solutions for assisted and automated driving e.g. sensing technologies

HELLA's view on Autonomous Driving – Components supplier

24GHz / 77GHz Radar	SHAKE*	LIDAR
 <p>Scalable radar family for complete information on vehicle surrounding</p>	 <p>Modular system architecture as key technology for intelligent touch & vibration sensing</p>	 <p>Scalable LIDAR technologies developed with strong USPs in regard to costs and integration</p>
<ul style="list-style-type: none"> Strong focus on Driver Assistance and NCAP relevant functions as driver for surround view Consequent modular platform approach to create flexible customer-oriented solutions 	<ul style="list-style-type: none"> Shake sensor for automated driving functions (\geq L2) Sensor system allows several low & high speed functions such as damage detection and road condition sensing 	<ul style="list-style-type: none"> LIDAR as additional technology for Autonomous Driving Tailor made HELLA solution based on existing serial competence

*Structural Health And Knock Emission; (1) Intelligent damage detection, (2) Adaptive impact detection, (3) Smart touch detection, (4) Predictive maintenance, (5) Road condition sensing

HELLA's 77 GHz radar sensor solution enables efficient 360° environment recognition for the entire vehicle

HELLA's view on Autonomous Driving – Technology Highlight



TECHNOLOGY 77 GHz Radar Sensor



KEY FACTS

- Highly integrated RF-CMOS Radar System Chip
- Higher functional object detection performance

KEY BENEFITS

- **Reduced size & weight** (significant package reduction compared to previous sensors)
- **Identifies & reacts to approaching vehicles from front-side** when entering a junction or pulling out forward from parking space
- **Identifies & warns of objects in blind spot**

MAIN FUNCTIONALITIES



Intersection Assistant



Automated Parking



Automated Driving



HELLA's multi lens array improves comfort and safety by supportive road projects for different driving situations

HELLA's view on Autonomous Driving – Technology Highlight



TECHNOLOGY Multi Lens Array



KEY FACTS

- Generation of sharp, contrasting and homogeneous images
- No loss of the graphic even by partially dirty lens, 170 micro projection lenses per Multi-Lens-Array generating 1 image
- Integration of projections with car sensors

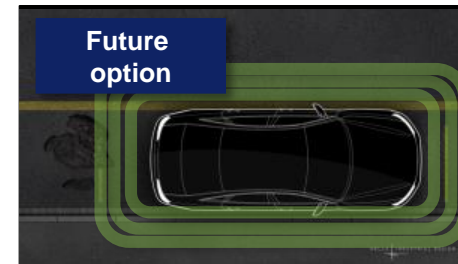
KEY BENEFITS

- **Enhances safety** through communication with pedestrians and other vehicles
- **Evokes emotions** by dynamic / changing lighting
- **Enables information** about autonomous driving status

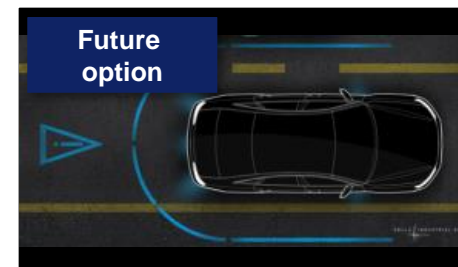
MAIN FUNCTIONALITIES



**Welcome
Light**



**Driving Status
Projections**

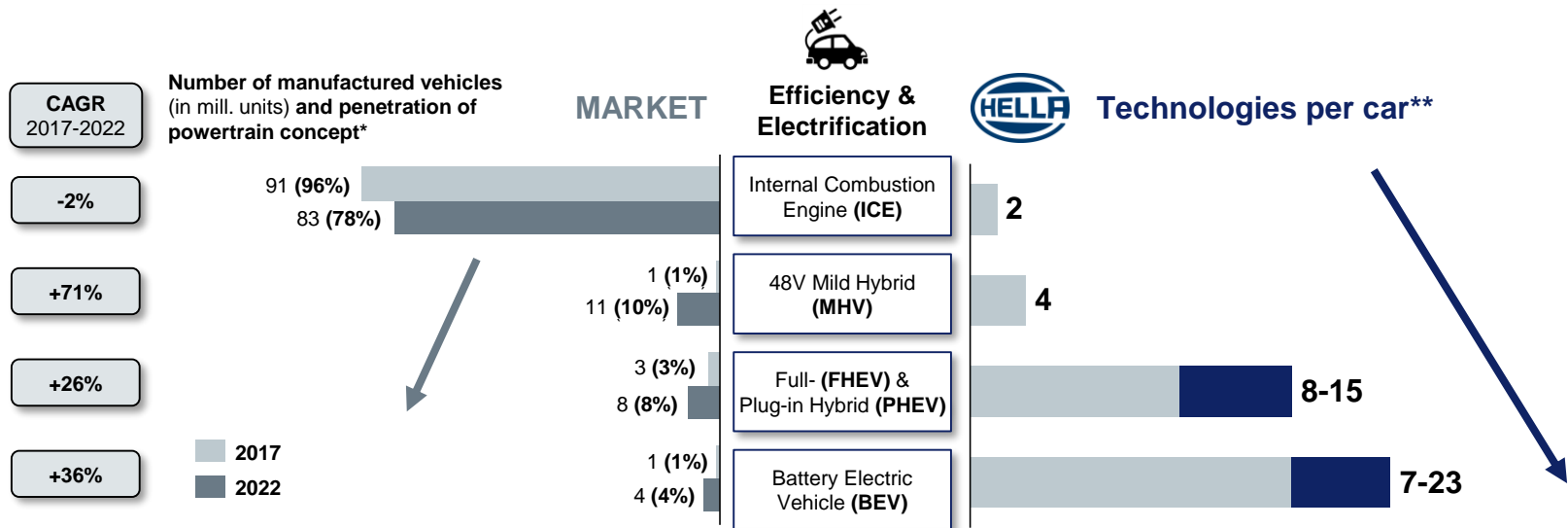


**Safety
Projections**



HELLA addresses the gradual shift from combustion engine to battery electric vehicles

HELLA's view on Efficiency & Electrification



MARKET Development

- **Gradual Shift within powertrain concepts** with strong momentum for penetration of electrified vehicles
- **Internal combustion engines will continue to be relevant** beyond 2030, but are expected to decline
- **Mild hybrid as intermediary solution** to achieve CO2 emissions and E-quote with strongest growth and biggest beneficiary
- **Further efficiency gains drive growth of new technologies** such as HV converters

HELLA Position

- **Focus on solutions for the energy managing of all powertrain concepts**, carry and strengthen top market position for ICE by next generation products (check)
- **Leverage Hybrid and Electric Vehicle competence** with further investments in development of DC/DC converters to benefit from increasing trend for mild-hybrids
- **Resources allocation to BMS and High voltage products**

* Based on global LVP, source: Strategy Analytics, HELLA analysis

** E.g. IBS, DC/DC converter (12V and 48V), BMS (incl. e.g. current sensor, cell monitoring device, battery control unit, isolation monitoring device)

Consequent roll-out of 48V DC/DC converter in order to participate in growing 48V market, especially in China

HELLA's view on Efficiency & Electrification – Technology Highlight



TECHNOLOGY 48V DC/DC-Converter



KEY FACTS

- Conversion efficiency > 95%
- Power rating according to alternator up to 3kW
- Scalability thanks to multi-phase approach

KEY BENEFITS

- Enables **new applications such as stop/start and idle cruising**, whilst ensuring the supply of fuel-efficient power loads such as electrical power-steering actuators
- **Innovative vehicle applications**, which support fuel efficient drive concepts such as high power regenerative braking or engine-off coasting applications

Awarded by
3 Customers

MAIN FUNCTIONALITIES



Enhanced Start-Stop



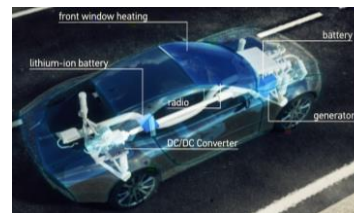
Engine-Off-Coasting



Boosting



High Power Braking



Backup Energy



Fuel Economy



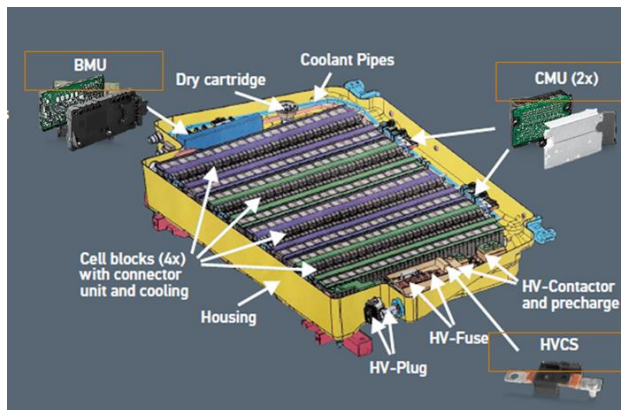
HELLA offers the electronics solution for lithium-ion battery management system

HELLA's view on Efficiency & Electrification – Technology Highlight



TECHNOLOGY BATTERY MANAGEMENT SYSTEM

KEY FACTS



BMS ECU: Battery state calculation and control of safety functions

Cell Controller: Voltage and temperature measurements as well as cell balancing

High Voltage Current Sensor: Measurement of battery current

Insulation Monitoring Device: Measurement of insulation resistance between HV and LV

(Integrated) Relay Box: Charge, pre-charge and main relays packaged including control electronics

KEY BENEFITS

- **Modular and scalable platform** for 12V, 48V and high voltage lithium-ion batteries
- **Best-in-class insulation monitoring device** in exclusive cooperation with BENDER

MAIN FUNCTIONALITIES

CALCULATE BATTERY STATE

- State of Charge
- State of Health
- Power capability
- Resistance

PROTECT BATTERY AND VEHICLE DRIVER

against

- Battery overheating
- Over voltage and current
- Contactor State of Health (SoH)



- Current
- Cell voltages
- Cell temperatures
- Battery voltages

MEASURE

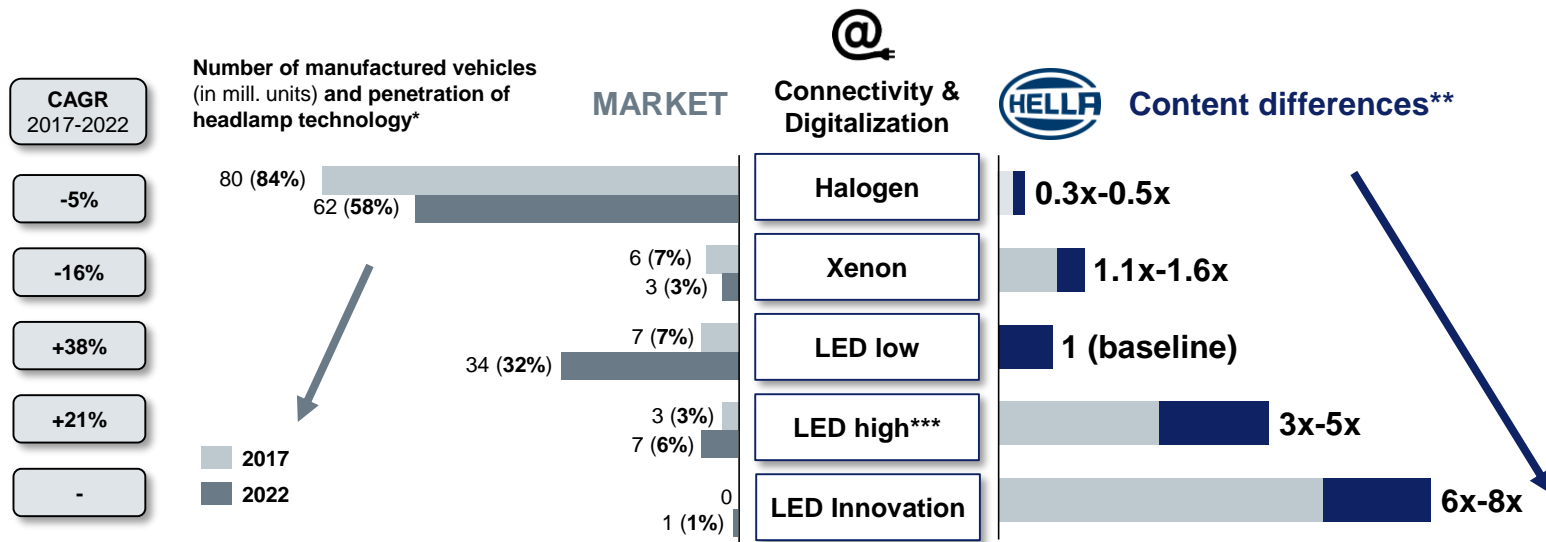
- Contactor
- Communication
- Limp home
- Pre-charge

CONTROL



HELLA pushes the digitalization of LED headlamp technologies in both mass and premium segments

HELLA's view on Connectivity & Digitalization



MARKET Development

- **Strong LED penetration growth globally (CAGR 35%),** Xenon to be replaced, Halogen stays as low cost solution
- **Europe with highest LED penetration,** growth esp. from standard and high LED, demand for high innovative solutions starting 2020
- **NAFTA demand for standard LED increasing strongly** despite regulation, LED high also with double digit CAGR
- **China with lowest LED penetration** but strongest LVP growth and strongest increase of standard LED solutions

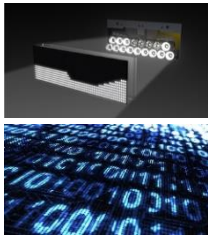
HELLA Position

- **Capture growth from increasing LED penetration** by offering broad technology portfolio to global customer base, focus on operational efficiency and process to penetrate mass markets
- **Leading edge solutions for high-end demand** especially in Europe
- **Localization strategy and ramp-up of resources** to serve high LED demand in China and NSA

* Based on global LVP and technical share of headlamp technologies (Source: IHS LVP forecast, HELLA estimates), **per vehicle, content differences based on global average market prices and future potential prices, ***LED high includes LED Advanced package and LED Advanced next generation

Software-controlled high definition headlamp accelerates functionalities and customer benefits

HELLA's view on Connectivity & Digitalization – Technology Highlight



KEY FACTS

- High definition lighting system with over 50.000 Pixel

KEY BENEFITS

- **State of the art functions**, e.g. bend light, glare-free high beam, etc. with optimized end-user impact
- **New functionalities**, e.g. C2P (Car To Pedestrian) and C2D (Car To Driver)
- **High end resolution**

NEW FUNCTIONALITIES



Pedestrian marking



Projection of cross-walk



Highlight the walk way

Innovative approach to optimize air quality in the vehicle based on particulate matter sensor and cloud-based solutions

HELLA's view on Connectivity & Digitalization – Technology Highlight



TECHNOLOGY Cloud-Based Air Quality Management



KEY FACTS

- Particulate Matter Sensor (PM2.5)
- For vehicles with automatic climate control
- Measurement of air properties, in the range of $25 \mu\text{g} / \text{m}^3$ - $500 \mu\text{g} / \text{m}^3$
- Particle size distribution detection by scattered light detection // amplitude of diffractive light depends on PM concentration

First to market

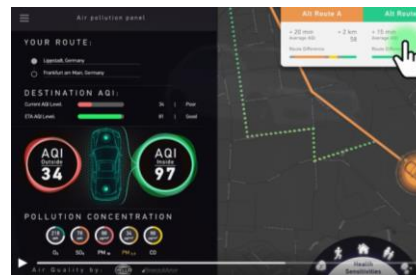
KEY BENEFITS

- **Detection of particulate matter** $< 2.5 \mu\text{m}$ (fine dust) in the inner cabin & ambient air
- **Greater driving comfort** due to continual optimization of the air quality in the vehicle
- High particle concentration leads e.g. to: sensor function for ventilation flap controlling (lowers in-cabin pollution level) or fine dust pollution level display as warning feature

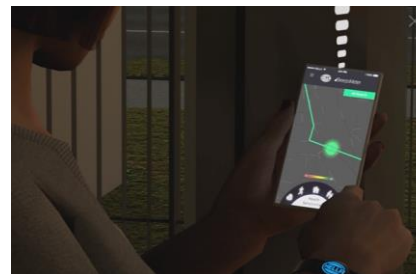
MAIN FUNCTIONALITIES



Pollution Notifications



Cloud-Based Clean Routing Option

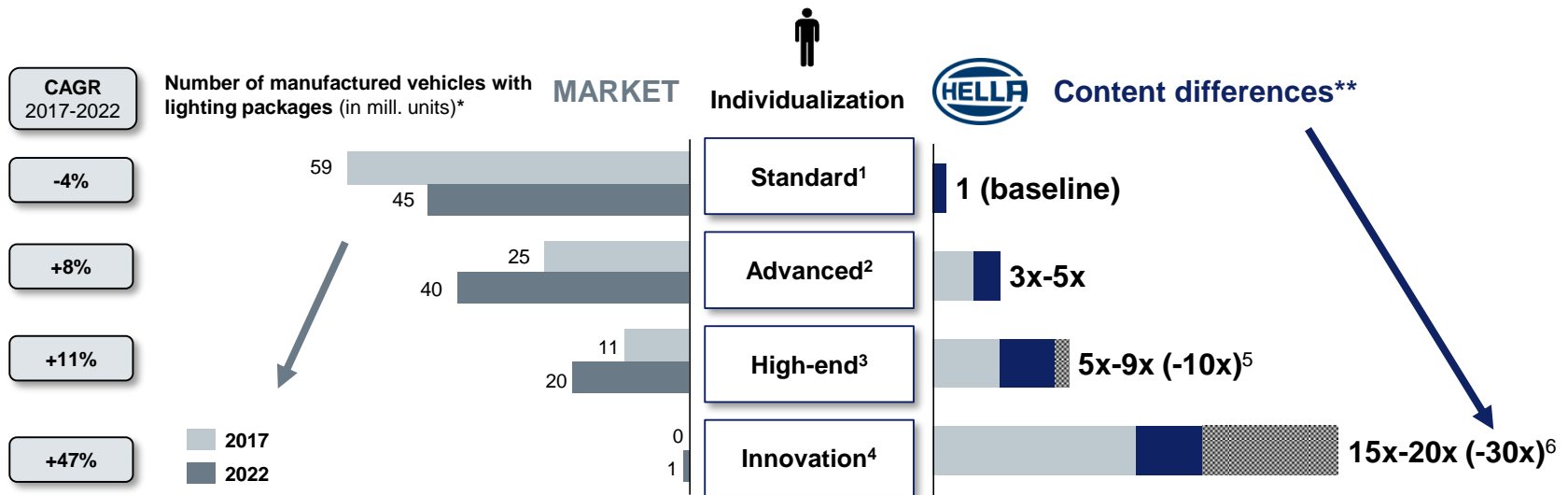


Cloud-Based Health Recommendations



HELLA offers interior and car body lighting solutions with individualized and connected features

HELLA's view on Individualization



MARKET Development

- **Increased demand for personalization of vehicle design and features** drives need for lighting packages in- and outside the car far beyond standard offering
- **Advanced ranks 1st in terms of market size in 2022**, substituting standard packages especially in Europe
- **Innovation with strongest growth over all regions**, penetration starts together with AD L4 and L5

HELLA Position

- **Offer smart lighting solutions to cover increasing individualization demand**, focus on ambient interior and effect exterior (surround) light
- **Introduce multi color LED** modules that interact with driver
- **Enable MLA technology** for new lighting features around the car linked to sensor data

* Taking into account technology penetration and estimated LVP; source: IHS LVP forecast, HELLA estimates)

** Content differences based on global average market prices and future potential prices

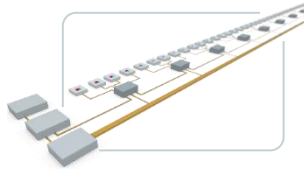
1) Includes courtesy lamp; 2) includes dome and static ambient lighting; 3) includes dome and dynamic ambient lighting; 4) includes dome and dynamic ambient lighting and grill illuminations; 5) plus car body lighting (MLA – Multi Lens Array); 6) plus car body lighting (MLA and grill)

HELLA's dynamic ambient lighting systems enhance user experience, safety and support automated driving scenarios

HELLA's view on Individualization – Technology Highlight



TECHNOLOGY Dynamic Ambient Lighting System



KEY FACTS

- Competence in light & electronics
- Light as a complementary information source for driving tasks
- Infinite number of high speed light scenarios

KEY BENEFITS

- **Integration** in customer E/E architecture
- **Supports** partially and high **automated driving**
- **Enhances safety** in complex traffic situations through warning function
- **Improves driving comfort** by personalization of light

MAIN FUNCTIONALITIES



**Advanced
Welcome
Scenario**



**Collision
Warning**



**Ambient &
Relaxing**





Technology with Vision

Thanks for your attention

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