



## **Capital Markets Day 2018**

The Art of Sight:
Our Path to Autonomous Driving
Berlin, February 15, 2018

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### **Capital Markets Day 2018**

### The Art of Sight – Berlin, February 15, 2018

TIME		TOPIC	WHO
10:30		Registration & Welcome	Dr. Kerstin Dodel
11:15	45 min	HELLA Group: Update on Strategic Positioning	Dr. Rolf Breidenbach
12:00	45 min	HELLA Group: Financials & Perspectives	Bernard Schäferbarthold
12:45	30 min	Q&A-Session	all
13:15	45 min	Lunch	all
14:00	45 min	HELLA's Approach to Autonomous Driving	Michael Jaeger, Kay Talmi
14:45	90 min	MARKET PLACES	
14:45	15 min	Market Place 1: Camera Software	Oliver Klenke
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16:15	30 min	Wrap-up / Closing remarks	all
16:45		End	



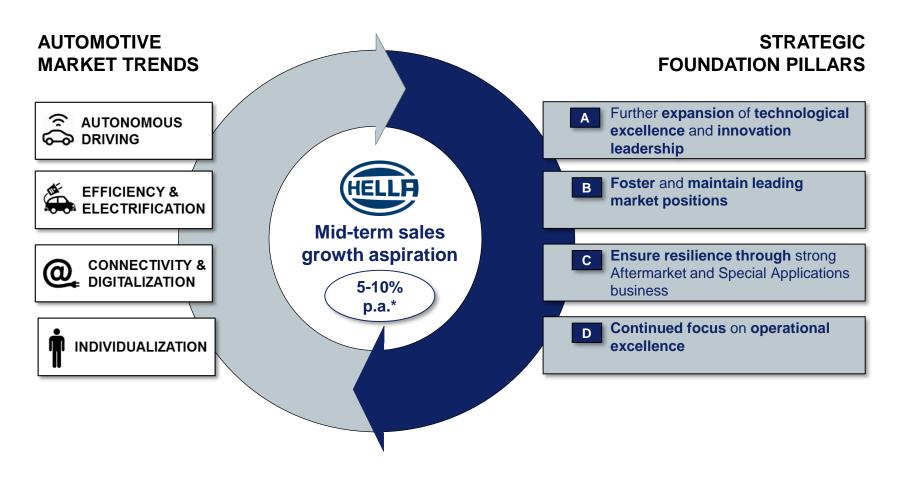
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# To continue its profitable growth path and to tap the full potential of market trends, HELLA follows a clear strategic action plan HELLA Group – Strategic approach



<sup>\*</sup>Sales growth between 5-10% p.a. based on FX rate as of June 2017



## HELLA's strategic action plan is well on track to capture market opportunities and fulfill growth aspiration

HELLA Group – Strategic action plan

#### STRATEGIC ACTION PLAN

- Further expansion of technological excellence and innovation leadership
- Capitalize favorable positioning along automotive market trends



ENCY & CONNECTIVITY & INDIV

- Foster and maintain leading market positions
- Benefit from volume and value growth opportunities based on strong market position
- Capture global growth opportunities in attractive markets (regions and customers)
- through strong Aftermarket and Special Applications business
- Ensure significant share in Aftermarket and Special Applications to maintain and strengthen overall business resilience

Continued focus on operational excellence

Continue structural improvements, optimization of operational efficiency and strengthening of HELLA workforce





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### Major insights resulting from latest market developments have to be incorporated into HELLA's strategic action plan

HELLA Group – Latest insights into trend development



**AUTONOMOUS** DRIVING (AD)

- 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



#### **Major implication**

Increasing relevance of system competence and partnerships



**EFFICIENCY & ELECTRIFICATION** 

- Accelerated penetration of electrified vehicles due to incentives and regulatory push
- Especially increasing demand for mildhybrid solutions
- Strong growth in China



#### **Major implication**

> Substantial growth opportunities for HELLA (worldwide, but especially in China)



**CONNECTIVITY &** DIGITALIZATION

- 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



#### **Major implication**

> New business opportunities e.g. cloud-based solutions, domain computer, digital aftermarket solutions



#### INDIVIDUALIZATION

- Stronger focus of OEMs and consumers on vehicle design features
- Increasing demand for passenger related applications and **functionalities**



#### **Major implication**

Additional growth opportunities for HELLA especially in the field of interior and car body lighting



## By offering tailored solutions for all levels of automation, HELLA participates significantly in Autonomous Driving trend

A. Expansion of technological excellence & innovation leadership



Capitalize
favorable
positioning
along
automotive
market trends

## AUTONOMOUS DRIVING



#### **KEY ACHIEVEMENTS**

since last Capital Markets Day, June 2017

- Market penetration of existing ADAS\* products further increased
   e.g. 24Ghz radar rolled-out in China and the US, first camera functionalities sold
- Core technologies for autonomous driving further developed
   e.g. full NCAP camera software functionalities developed, LIDAR predevelopment started, radiator grill for vehicle-to-pedestrian communication
- System competence with new partnerships strengthened
   e.g. partnerships with ZF and NVIDIA successfully established

#### OUTLOOK

- Drive position as strong component supplier incl. software competence
   e.g. push modular platform approach for radar products, introduce camera software business model, push further development of LIDAR sensor, roll-out SHAKE\*\* sensor
- Drive future lighting concepts as enablers for AD functionalities
   e.g. develop interior and car body lighting concepts with vehicle-to-X communication possibilities
- Position HELLA as (sub-)system supplier
  - e.g. enter market as Tier 1 supplier for automated parking applications, penetrate market for L4/L5 as Tier 2 supplier by leveraging partnership network

presented



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<sup>\*</sup>Advanced Driver Assistance Systems; \*\*Structural Health And Knock Emission

## Lighting will play an important role as enabler for Autonomous Driving functionalities

A. Expansion of technological excellence & innovation leadership



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## AUTONOMOUS DRIVING

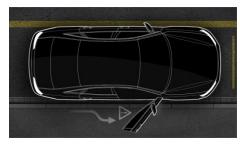


#### **HIGHLIGHT:** Car Body Lighting

#### **CURRENT USE CASES**



Illuminated grill as indication option for autonomously driving cars, presented at IAA 2017 in Frankfurt



Safety projections for autonomously driving cars, presented at NAIAS 2018 in Detroit

**Examples of future light based** communication features to support Autonomous Driving functionalities



Contour illumination



Breakdown warning



Advanced safety projections



## HELLA focuses on attractive software and sensor solutions for efficient energy management of all powertrain concepts

A. Expansion of technological excellence & innovation leadership



Capitalize
favorable
positioning
along
automotive
market trends

## EFFICIENCY & ELECTRIFICATION



#### **KEY ACHIEVEMENTS**

since last Capital Markets Day, June 2017

- Market penetration of products for higher Internal Combustion Engine (ICE) efficiency increased
  - e.g. take rate for Intelligent Battery Sensor, 12V DC/DC converters, and Fuel Control Modules increased, Purge Pump introduced
- Enabler technologies for hybridization further rolled-out
  - e.g. 48V DC/DC converter, Battery Management System
- Core know-how for Full-Hybrid and Electric Vehicles strengthened

e.g. competence regarding high-voltage Battery Management Systems increased, predevelopment of further high-voltage products started

#### OUTLOOK

- Push technologies for increased ICE efficiency
  - e.g. localize Intelligent Battery Sensor in China and Nafta, develop next purge pump generations, push penetration of (standard) LED solutions
- Enhance product offering for mildhybrids
  - e.g. foster modular Battery Management System family for different battery concepts (low/dual voltage), drive global roll-out of 48V DC/DC converter
- Leverage Hybrid and Electric Vehicle competence further
  - e.g. develop 2nd Battery Management System generation, introduce Battery Management System in China, push predevelopment of further high-voltage products



## Significant CO2 reduction of conventional powertrains thanks to HELLA's innovative electric purge pump

A. Expansion of technological excellence & innovation leadership



Capitalize
favorable
positioning
along
automotive
market trends

## EFFICIENCY & ELECTRIFICATION



#### **HIGHLIGHT:** Electric purge pump



Electric purge pump

#### **KEY FACTS**

- Joint development of HELLA and ebmpapst
- Pump cleans the canister from hydro-carbons
- Electrification of purging process leads to a significant reduction of the vehicle's CO2 emissions
- Awarded by first customers and SOP in 2019



Responsible for the "interface" unit

Develops the electric motor and the impeller for the pumping unit

#### **NEXT STEPS**

- Ensure smooth start of production
- Foster global roll-out (Europe, NSA and China)
- Develop next purge pump generations and expand partnership



## HELLA pushes the development of new digital technologies, services and business models

### A. Expansion of technological excellence & innovation leadership



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Capitalize
favorable
positioning
along
automotive
market trends

## CONNECTIVITY & DIGITALIZATION



#### **KEY ACHIEVEMENTS**

since last Capital Markets Day, June 2017

- Competence concerning digital lighting solutions strengthened
   e.g. next generation of high definition (HD) matrix LED headlamp launched, laser high beam in serial production
- New cloud-based business solutions developed
  - e.g. cloud-based air quality sensor for air quality management in the vehicle, digital B2B2C service platform for the Aftermarket
- Market for software solutions and services entered
  - e.g. open and scalable business model for front camera software introduced

#### OUTLOOK

solutions

- Further push headlamp strategy according to customer demands
   e.g. explore new use cases and functionalities for digitalized lighting
- Drive innovative "over the air" product solutions
  - e.g. foster personalized proactive health management solutions, accelerate digital business models in the Aftermarket
- Explore and push business model "software as a product"
  - e.g. further roll-out of business model for camera software, analyze business potential for domain computers



## HELLA's cloud-based air quality sensor results in better driving comfort and offers proactive health management solutions

A. Expansion of technological excellence & innovation leadership



Capitalize
favorable
positioning
along
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## CONNECTIVITY & DIGITALIZATION



**HIGHLIGHT:** Cloud-based Air Quality Sensor



Particulate Matter Sensor (PM 2.5)

#### **KEY FACTS**

- Sensor from HELLA measures the level of particulate matter both inside and outside the vehicle
- 1st customer order received
- Partnership cooperation with BreezoMeter
- BreezoMeter enriches particulate matter data with cloud-based air quality data to offer an enhanced and connected air quality management system







Responsible for Particulate Matter Sensor (PM 2.5) Provides algorithm to analyze particle concentration and enriches data with cloud-based air quality data

#### **NEXT STEPS**

- Work on further components for future interior comfort and health concepts
- Explore further use cases, e.g. Particulate matter information, Cloud-Based Clean Routing, Cloud-Based Health Recommendations



## HELLA offers smart lighting and electronic solutions to cover increasing individualization demand of customers

A. Expansion of technological excellence & innovation leadership



Next

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Capitalize
favorable
positioning
along
automotive
market trends

#### INDIVIDUALIZATION



#### **KEY ACHIEVEMENTS**

since last Capital Markets Day, June 2017

- Innovative interior and car body lighting functions launched
   e a light carnet overhead console wi
  - e.g. light carpet, overhead console with integrated Matrix LED reading lamp, light bands, 1st generation of light grill illuminations introduced
- Attractive rear end styling options realized
  - e.g. first mass-produced OLED rear combination lamps with animated welcome scenarios
- Sensor portfolio for individualization of vehicle functions strengthened
   e.g. predevelopment of advanced passive entry systems with digital keys / smart devices used as ID for car access

authorization started

#### OUTLOOK

- Drive lighting innovations for illumination of Car Body and "interior of the future"
  - e.g. develop next generation of Multi-Lens-Array, start development of next generation of grill illuminations
- Further explore new lighting technologies for rear end styling options
  - e.g. flexible OLEDs, holography, diffractive optics (DOE), laser
- Focus on electronics innovations for advanced personalization of vehicle features
  - e.g. push development of digital key for smart access, explore smartphone integration



## Interior Lighting as important enabler for individual styling options and passenger-related functionalities

A. Expansion of technological excellence & innovation leadership

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Capitalize
favorable
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#### **INDIVIDUALIZATION**



### **HIGHLIGHT:** Interior Lighting

## CURRENT PRODUCT EXAMPLES

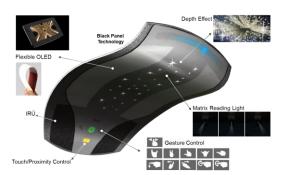


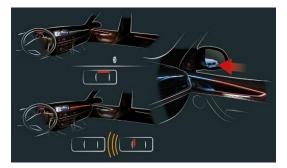
**Ambient Lighting** 



**Overhead Consoles** 

Develop "Interior of the Future" as own ecosystem for individual styling and Autonomous Driving







### To capture global growth opportunities, HELLA pursues a tailored product strategy for key regions

B. Foster and maintain leading market positions



#### Capture global growth opportunities in attractive markets

#### **PRODUCT STRATEGY**



#### **KEY ACHIEVEMENTS**

since last Capital Markets Day, June 2017



**NAFTA** 

- portfolio enhanced e.g. strong growth of Energy Manage
  - ment products and rear radar solutions in US

**Market penetration of Electronics** 

LED headlamp business increased e.g. projects with big US OEMs acquired



- **Europe**
- Market position in Energy Management further strengthened e.g. No 1 position with 48V DC/DC converters
- Innovation leadership demonstrated with animated Lighting solutions e.g. OLED rear combination lamp with welcome scenario for premium OEM



- **Energy Management solutions** awarded
- e.g. Battery Management System, 48V DC/DC converter
- **Market penetration of Lighting** solutions increased e.g. industrialization of Halogen and LED modules in China

#### OUTLOOK

- Continue roll-out of Electronics and localization of products
  - e.g. push 48V DC/DC converters, drive existing portfolio & innovations (77Ghz radar, SHAKE sensor)
- Foster LED headlamp growth with local / international OEMs
  - e.g. focus on advanced LED headlamp solutions
- **Boost further penetration of Electronics** portfolio
  - e.g. push introduction of 77GHz sensors; drive roll-out of camera software business
- Maintain innovation leadership in Lighting e.g. develop innovative interior and car body lighting solutions, push further penetration of LED headlamps
- Serve growing demand for electronics and lighting in China
  - e.g. Accelerator Pedal Sensors, Battery Management System, 48V DC/DC converters LED lighting systems
- **Explore additional opportunities in India** e.g. 48V Battery Management System li-ion (e-2/3 wheeler)



### HELLA is continuously investing into its global footprint to foster and maintain leading market position

B. Foster and maintain leading market positions

Capture global growth opportunities in attractive markets

#### **GLOBAL FOOTPRINT**



**Key Achievements** since last Capital Markets Day, June 2017

Outlook



USA Northville

technical center for Electronics

Opening in early 2019



Germany Lippstadt

New visitor. administration and exhibition center Opening mid-2019



Lithunia Kaunas

New **Electronics plant** SOP mid-2018



China Wuqing

**New Lighting plant** with Joint Venture-Partner BHAP SOP in 10/2017



Mexico Guanajuato

**New Electronics plant** SOP in early 2018



Germany Lippstadt

**Digital Innovation Campus,** in collaboration with Hamm-Lippstadt University and other partners; opening in 2020



China Shanghai

**Extension of Electronics** plant, SOP mid-2018



Mexico Irapuato & Guadalajara

**Extension of two Lighting plants** SOP in 11/2017



India Mehsana

**New Electronics plant** SOP in early 2019



India Coimbatore

Additional R&D center for lighting technology Opening in 07/2017

SOP: Start of production



## By enhancing its established partner network towards agile partnerships, HELLA further strengthens its market position

Kind of



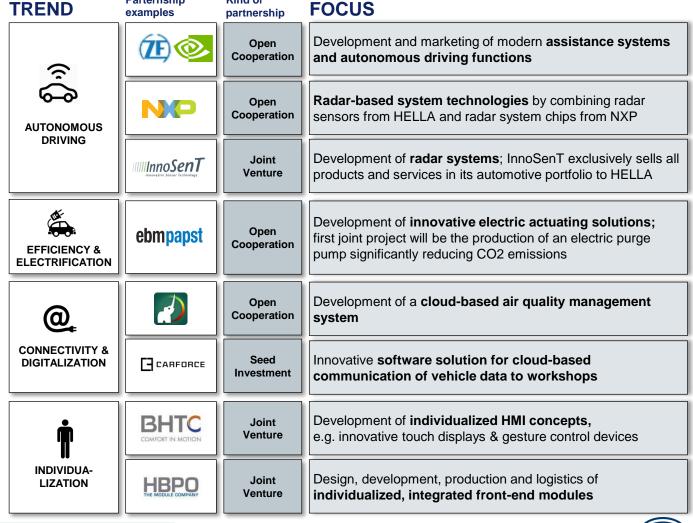
### B. Foster and maintain leading market positions

**Parternship** 

Capture
global growth
opportunities
in attractive
markets!

#### PARTNERSHIP NETWORK







## HELLA is pushing its Aftermarket business by offering new solutions along the digital value chain

### C. Strong Aftermarket and Special Applications business



Ensure
significant
share in
Aftermarket
and Special
Applications
to maintain
and strengthen
overall
business
resilience



**AFTERMARKET** 

#### **KEY ACHIEVEMENTS**

since last Capital Markets Day, June 2017

- IAM product portfolio broadened
   e.g. core Electronics/Electrics products
   strengthened, vehicle specific lighting
   products launched, offering of 3rd party
   products enhanced
- Workshop diagnostic tools and services successfully rolled-out
   e.g. new high-end diagnostic solution mega macs 77 presented, market penetration of camera/radar/sensor calibration tool increased
- Digitalization of wholesale business further driven

e.g. digital B2B2C service platform rolledout in Denmark, E-commerce business strengthened

#### OUTLOOK

- 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 productsand 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



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## New high end diagnostic device mega macs 77 successfully introduced to German market

### C. Strong Aftermarket and Special Applications business



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AFTERMARKET

#### **HIGHLIGHT:** mega macs 77





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 VINidentification with automated link to parts catalogue

#### **OUTLOOK**

- German roll-out since early February, international roll-out starting March
- mega macs 77 hardware and software architecture as platform for further products
- Next-generation software at Automechanika 2018, taking guided repair another step forward



## HELLA is transferring its Automotive core competences to customer groups in the Special Applications segment

### C. Strong Aftermarket and Special Applications business



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SPECIAL APPLICATIONS

#### **KEY ACHIEVEMENTS**

since last Capital Markets Day, June 2017

- Offering of innovative LED solutions increased
  - e.g. new modular work-lamps & rearlamps launched, safety projector Visiotech introduced, advanced front lighting systems applied in predevelopment projects
- Electrics / Electronics competence enhanced
  - e.g. innovation cell established, advanced engineering project set-up, sophisticated sales and marketing training concept in place
- Market position in multiple customer segments strengthened
  - e.g. leading position in Europe in core customer segments such as agriculture and construction further improved

#### **OUTLOOK**

- 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 and the operator's comfort

### C. Strong Aftermarket and Special Applications business



Ensure significant share in **Aftermarket** and Special **Applications** to maintain and strengthen overall business resilience



**SPECIAL APPLICATIONS** 

#### **HIGHLIGHT:** Visiotech Technology



#### 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)





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

#### **Projection Module**



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



## By continuously strengthening its operational excellence, HELLA further improves its competitiveness

### D. Continued focus on Operational Excellence



Continue
structural
improvements,
optimization of
operational
efficiency and
strengthening
of HELLA
workforce





PEOPLE

#### **KEY ACHIEVEMENTS**

since last Capital Markets Day, June 2017

- Footprint and organizational structures further improved
  - e.g. global production and development capacities expanded, Special Applications plant relocated to Eastern Europe, integration of Automotive Sales into business divisions initiated
- Operational efficiency along the whole value chain increased
  - e.g. IT landscape in Aftermarket and Special Applications consolidated, Deep Learning applied to improve quality and efficiency of production processes
- Global workforce strengthened and further qualified

e.g. employee base increased by 5%, E-learnings rolled-out further, analysis of employee value proposition started, innovative work environments opened

#### OUTLOOK

- Drive footprint optimization and structural improvements
  - e.g. continue expansion of global network, drive excellence program to further strengthen corporate functions, optimize Aftermarket sales & logistics network
- Foster further increase of operational efficiency
  - e.g. harmonize & invest in IT infrastructure, drive consolidation of ERP landscape, continue improvement programs, foster Business Process Management to standardize processes
- Ensure attraction, retention and qualification of employees
  - e.g. foster HR Excellence, ensure global knowledge transfer and roll-out of training concepts



### The foundation pillars of HELLA's strategic action plan are still valid to ensure further profitable growth

HELLA Group – Strategic outlook

#### STRATEGIC ACTION PLAN

Profitable growth and benefiting from major market trends!

- Further **expansion** of technological excellence and innovation leadership
- Capitalize favorable positioning along automotive market trends









Foster and maintain leading market positions

- Capture global growth opportunities in attractive markets (regions and customers)
- Strengthen market position by enhancing and deepening partnership network
- **Ensure resilience** through strong Aftermarket and Special Applications business
- Push Aftermarket business by offering new solutions along the digital value chain
- Transfer automotive core competences to Special Applications segment

Continued focus on operational excellence

Continue structural improvements. optimization of operational efficiency and strengthening of HELLA workforce!



<sup>\*</sup>Sales growth between 5-10% p.a. based on FX rate as of June 2017

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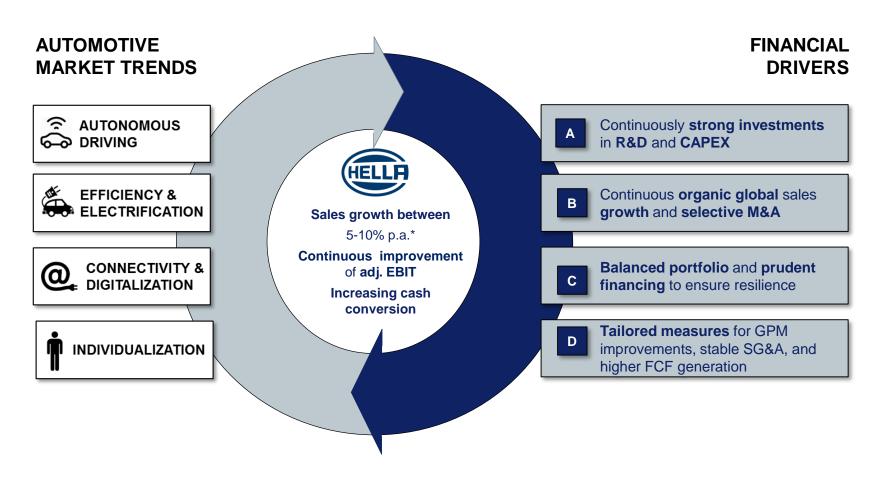
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## To secure and support its profitable growth path, HELLA has a close eye on key financial drivers

HELLA Group – Financial Drivers

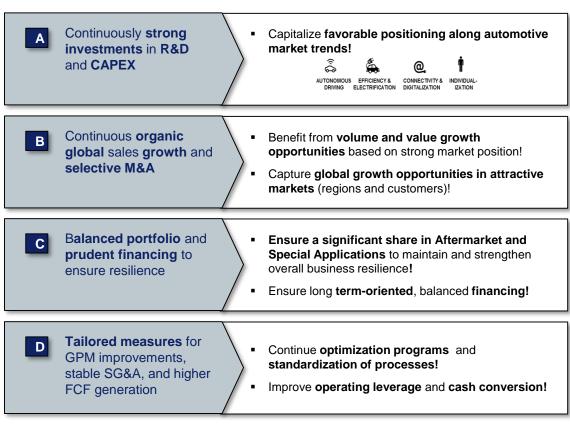






# Based on the defined financial drivers action plan, HELLA aspires to realize a positive development of its performance indicators HELLA Group – Financial Drivers Action Plan

#### FINANCIAL DRIVERS ACTION PLAN





# Major insights from latest market developments have to be incorporated into HELLA's financial drivers action plan HELLA Group – Latest insights into major market developments

## Major developments

#### macroeconomic

- Only modest underlying economic development
- Political environment unstable (elections in Europe, discussions about trade barriers, Brexit) and more restrictive (CO2 regulations in Europe)
- Core currencies (US Dollar, Renminbi) weakened
- Increasing raw material prices

#### microeconomic

- Global light vehicle production with only modest growth below 2%
- Basically zero growth in NSA, moderate growth in Europe, flattening perspectives in China
- Required investments in trends change capital allocation and innovation budget on OEM side

## Major financial implications



- > General market development provides no significant tailwind for HELLA
- > HELLA volume and value growth mainly driven by market trends
- > FX-effects weigh negatively on topline growth
- > Strong focus on operational efficiency to secure profitability targets
- Stringent allocation of R&D resources and continuous investment in footprint and functions required
- > Potential M&A targets with currently high valuation



## To tap into potential of automotive market trends, HELLA focuses on stringent allocation of R&D and CAPEX

A. Continuous R&D and CAPEX to invest in future growth



#### **KEY ACHIEVEMENTS**

since last Capital Markets Day, June 2017

#### **R&D Ratio**

mid term target:

level of around 9.7%

## Current development in line with expectations

- Ratio H1 FY 17/18 at 9.8% (+0.1pp YoY)
- Currently launch support for production ramp-ups and network extensions
- Several projects in pre-development (especially energy management and autonomous driving)

#### OUTLOOK

## R&D as prerequisite for profitable growth, focus on efficient project development and capturing market trends

- Prioritization of projects and R&D allocation is core
- Volatility between 9.5%-10% driven by investments in opportunities and expansion of global capacities with increased number of specialists

## Net CAPEX / SALES

mid term target:

level of around 7.5%

## Current development in line with expectations

- Ratio currently at 6.2% (-0.3pp YoY) driven mainly due to high reimbursements; guided ratio of 7.5% for FY 17/18 unchanged
- Gross CAPEX grew as expected; currently 5 new plants in parallel, exceptional situation

## Mid-term targets unchanged, growth investments in projects and facilities is core

- Stringent focus on reimbursement terms, cash first vs. amortization over prices
- First production ramp-ups in new facilities started; increasing utilization to 80-90% within next 1.5 - 2 years



## HELLA will show continuous organic global sales growth driven by volume & value add and seeks selective M&A

B. Continuous organic sales growth and selective M&A



#### **KEY ACHIEVEMENTS**

since last Capital Markets Day, June 2017

## Organic growth

## Strong growth with market leading products

- Sales growth H1 FY 17/18 at 9.3% after weak comparable basis esp. in Q2 PY
- Demand for energy management & driver assistance products as well as advanced lighting products
- Regional outperformance due to market share wins

## Inorganic growth

## M&A capabilities strengthened, execution difficult due to high market valuations

- Internal M&A resources strengthened
- Ongoing screening, supported by external advisors
- Discussions with potential targets on decision maker level
- Realization of synergy value difficult due to market prices

#### **OUTLOOK**

## Unchanged mid-term target sales growth between 5%-10% p.a.

- Volume growth especially for sensors and LED lighting
- Value growth in Electronics and Lighting driven by trends
- Regional growth esp. in NSA and China
- Flexible partnerships to benefit from the pace of change of the Automotive industry

#### Realization of opportunities in adjacent business fields with complementary technologies, products or regions

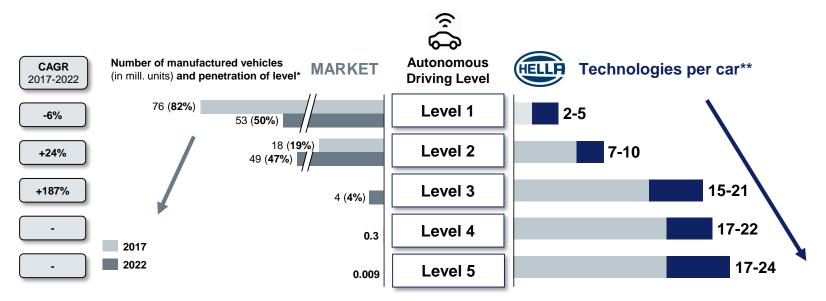
- Strengthen sensor and actuator portfolio in Electronics
- Add selective competences in Lighting
- Special Applications with targets in Lighting & Electronics in Europe and US



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

### B. Benefit from volume and value growth





#### **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

- 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

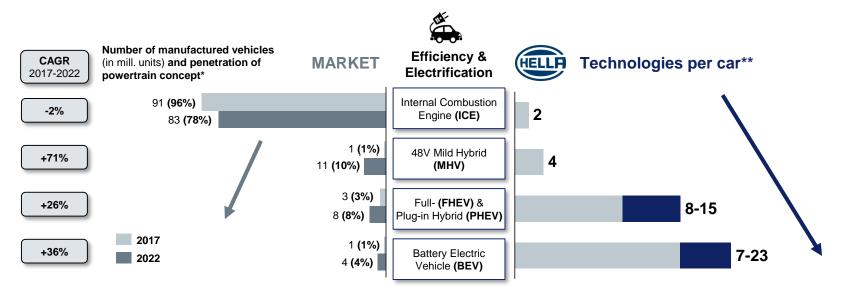
<sup>\*\*</sup> Includes radar sensors (24 GHz and 77 GHz), front camera software functionalities (traffic sign, lane, light, object detection), LIDAR, and SHAKE. Potential # of sensors includes redundancies



<sup>\*</sup> Based on global LVP, source: IHS, Strategy Analytics, HELLA analysis

## For continuous organic growth, HELLA addresses the gradual shift from combustion engine to battery electric vehicles

### B. Benefit from volume and value growth



#### **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

- 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

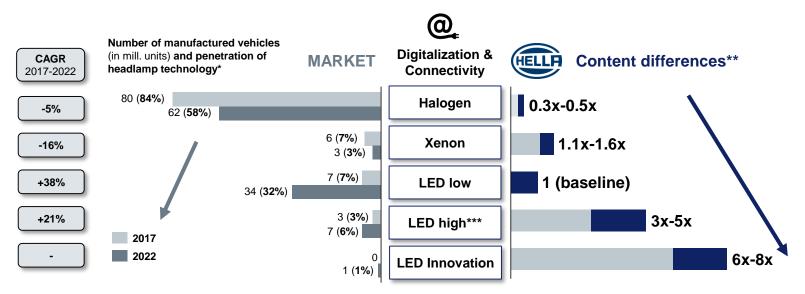


<sup>\*</sup> Based on global LVP, source: Strategy Analytics, HELLA analysis

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

## For continuous organic growth, HELLA exploits the increasing LED headlamp penetration in mass & premium

### B. Benefit from volume and value growth



#### **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

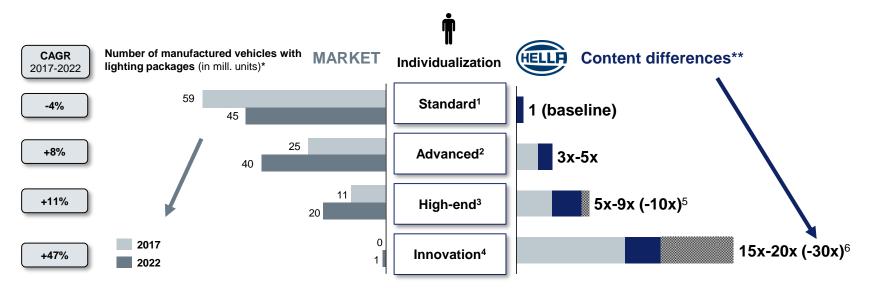
- Capture growth from increasing LED penetration by offering broad technology portfolio to global customer base, focus on operational efficiency and process to penetrate mass markets
- Leading edge solutions for high-end demand especially in Europe
- Localization strategy and ramp-up of resources to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

<sup>\*</sup> 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



## For continuous organic growth, HELLA offers interior & exterior lighting solutions with individualized & connected features

### B. Benefit from volume and value growth



#### **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

- 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

<sup>1)</sup> 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)



<sup>\*</sup> Taking into account technology penetration and estimated LVP; source: IHS LVP forecast, HELLA estimates)

<sup>\*\*</sup> Content differences based on global average market prices and future potential prices

## HELLA focuses on strong Aftermarket & Special Applications business and long-term oriented financing





#### **KEY ACHIEVEMENTS**

since last Capital Markets Day, June 2017

## Aftermarket and Special Applications

mid term target:

continuous improvement of EBIT and Cash Flow generation

### Non-automotive segments with positive contribution:

- Aftermarket (AM) with positive external sales development (+3.6%) in H1 FY 17/18 based on IAM (+5.6%) and Wholesale (+6.2%). Portfolio and branch extensions are main drivers. AM with overall constant profitability (EBIT margin at 6.1%)
- Special Applications +13% sales growth due to Agriculture & Construction (both +~30% growth)
- Innovative/digital Workshop products declined YoY, acceleration in H2 FY 17/18 expected

#### OUTLOOK

#### Further growth and margin improvement:

- Leverage strong position in Aftermarket with a broad portfolio of core & 3<sup>rd</sup> party products, future calibration & diagnostic tools and investments in digital business models
- Drive LEDfication and E/E innovations in Special Applications, balance over-proportional demand from FY 17/18
- Special Applications with normalized EBIT margin of around 10%

#### Leverage

mid term target:

Net Debt / EBITDA <1X

#### Leverage ratio low despite re-financing of debt:

- Leverage ratio currently at 0.3x vs 0.4x H1 FY 16/17, comparably high equity ratio at around 42%
- Successful refinancing of 300 mill. Euro bond with maturity September 2017
- Optimized financing structure e.g. Mexico USD 200m external financing

### Further balanced financing to counter cyclicity and have flexibility to finance growth:

- Have necessary funds to finance M&A opportunities and network extensions
- Further optimization of financing structure



<sup>\*</sup>Abbreviation for "American Family Life Insurance Company"

## HELLA focuses on operational excellence and increasing competitiveness to improve operating leverage





#### **KEY ACHIEVEMENTS**

since last Capital Markets Day, June 2017

### Gross Profit Margin

mid term target:

increasing

## Current development in line with expectations, ramp-ups weigh negatively on margin:

- GPM up by 0.3pp YoY to 28.1% additional costs due to ramp-ups in FY 17/18
- Increasing utilization of existing capacity due to high automotive growth

#### OUTLOOK

## Further increase driven by growth (content & volume) as well as leverage:

- Further improvement of project maturity & launch readiness
- Foster process improvements
- Normalized level of capacity increases after expansion phase
- Closing the price-cost-scissor with respect to materials

#### SG&A Ratio

mid term target:

overall stable

## Current development in line with expectations, balancing efficiency gains and investments:

- SG&A ratio down by 0.2pp YoY to 10.5%
- Reduction of complexity and efficiency gains in globalized network

## Improvement programs ongoing but investments in functions needed:

- Further standardization with stringent process management
- Modernization of system architecture
- Implementation of new IT infrastructure and software (e.g. S4/HANA)
- Further hiring and continuous employee qualification



# HELLA focuses on Working Capital improvements and Capital efficiency to improve cash conversion

# D. Tailored measures for higher FCF generation



## **KEY ACHIEVEMENTS**

since last Capital Markets Day, June 2017

## Free Cash Flow

mid term target:

increase of cash conversion

Short term improvement of cash conversion ratio, driven by higher funds from operations and lower net capex ratio:

- Cash conversion ratio up by 3.5pp YoY to 31.1% due to strong growth of funds from operations
- Adj. EBIT margin improved by 0.1pp YoY to 8.5% in H1 FY 17/18, lower margin in H2 expected
- Working Capital/Sales ratio (LTM)
   decreased by 0.6pp to 15.2%. WC
   consumption increased mainly due to
   receivables (growth in China) and inventory
   (production-runs, safety stocks and
   wholesale expansion)
- Cash Conversion project on track
- Net CAPEX/Sales down by 0.3pp to 6.2%

#### OUTLOOK

Further increase of cash conversion ratio to self-finance investment needs with focus on three levers:

- Profitability increase, continuous improvement of adjusted EBIT
- Working Capital with significant improvements, potential especially coming from payables and inventory
- Working Capital management needs to balance operational needs and reducing targets
- Net CAPEX/Sales ratio overall stable, but increase in CAPEX efficiency targeted and monitored by task force
- CAPEX needs driven together with capacity ramp-ups by growth related project investments (tools)



# HELLA focuses on Working Capital improvements as major driver for improved cash conversion

D. Tailored measures for higher FCF generation



## **KEY ACHIEVEMENTS**

since last Capital Markets Day, June 2017

# Cash Conversion Project with achievements on all three layers

 Contractual terms optimized, key customers with strong commitment

- Claim management process optimized with joint tracking on customer, product and entity level
- Systematic process to track and reduce open billings started

## Warehouse optimization analyses completed

- Inbound logistics initiative continued
- Majority of no- and slow-movers identified and processed

# Contractual terms optimized: negotiations with majority of lead suppliers successful, approach of smaller suppliers started

- Fully integrated reporting including direct and indirect materials available
- Joint optimization of consignment stock and payment terms started

## OUTLOOK

# Drive Cash Conversion project with focus on trade payables and inventories

- DSO contribution to CC overall moderate, standardization of worldwide payment terms is key
- Stringent management of overdues, monitoring on each single invoice level and sustainable improvement targeted
- High DIO improvement targeted, improvement of logistics structures incl. warehouse & network in Aftermarket
- Further optimize order fulfillment process
- Optimize sales planning and production planning
- Significantly improve DPO as driver for CC targeted with lead buyer approach and ongoing negotiations to optimize terms
- Optimizations of smaller suppliers and general focus on payables as important supplier selection criteria

# Capital / Sales

Working

mid term target:

RECEIVABLES

**NVENTORY** 

**PAYABLES** 

decreasing by 3pp



# HELLA thoroughly monitors capital efficiency and tracks progress of cash conversion project

D. Tailored measures for higher FCF generation



### **KEY ACHIEVEMENTS**

since last Capital Markets Day, June 2017

## CAPEX Task Force

# Project progress on track, all parties with respective "homework"

- Dedicated concepts for improvements of utilization and standardization established
- Improvement measures rolled-out
- Organizational changes triggered

#### OUTLOOK

# Midterm focus on capital efficiency, further improvement of cash conversion possible

- Foster leverage / re-use of equipment
- Further increase value-chain efficiencies
- Improve utilization of existing production space

# Cash Conversion project

- Cash Conversion project overall on track on all levers
- Long term project with step-by-step improvements in a 1st wave until May 2020
- Benchmark analyses on working capital elements showed potential improvements especially on payables of around 20 days. Aspiration level for further discussions
- Clear responsibilities, top management governance, and defined structures to secure target achievements for Working Capital and CAPEX efficiency



# HELLA's financial drivers are still valid to secure and support the further proftiable growth path

HELLA Group – Financial Outlook

# FINANCIAL DRIVERS ACTION PLAN

Profitable growth and benefiting from major market trends!

- Continuously strong investments in R&D and CAPEX
- Capitalize favorable positioning along automotive market trends!

AUTONOMOUS EFFICIENCY & CONNECTIVITY & INDIVIDUAL DRIVING ELECTRIFICATION DIGITALIZATION IZATION

- Continuous organic global sales growth and selective M&A
- Benefit from volume and value growth opportunities based on strong market position!
- Capture global growth opportunities in attractive markets (regions and customers)!
- Ensure resilience with balanced portfolio and prudent financing
- Ensure a significant share in Aftermarket and Special Applications to maintain and strengthen overall business resilience!
- Ensure long term-oriented, balanced financing!
- Tailored measures for GPM improvements, stable SG&A, and higher FCF generation
- Continue optimization programs and standardization of processes!
- Improve operating leverage and cash conversion!



<sup>\*</sup>Sales growth between 5-10% p.a. based on FX rate as of mid 2017

# **Capital Markets Day 2018**

# The Art of Sight – Berlin, February 15, 2018

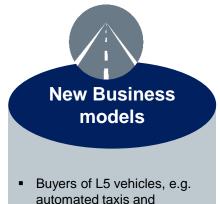
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# Autonomous Driving as one of the key market trends is boosted by many drivers

Main driver and enabler for Autonomous Driving

## **DRIVER**



mini-buses



- Take human factor out of the equation
- EU target to bring road casualties close to zero by 2050



# Sharing Economy

- In 2030, 10% of new cars sold could be shared vehicles
- L3/L4 offer new opportunities for P2P or B2C sharing



## **ENABLER**



 Hardware & Software to realize AD functions



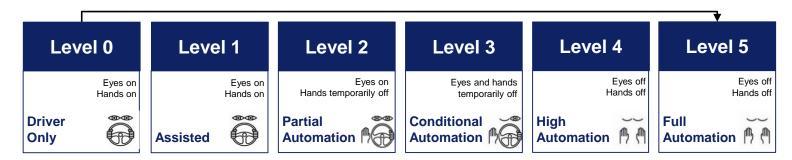
## Regulation

 Safety regulation (NCAP) favorable for L1/L2 and uncertainty on permission of L3+

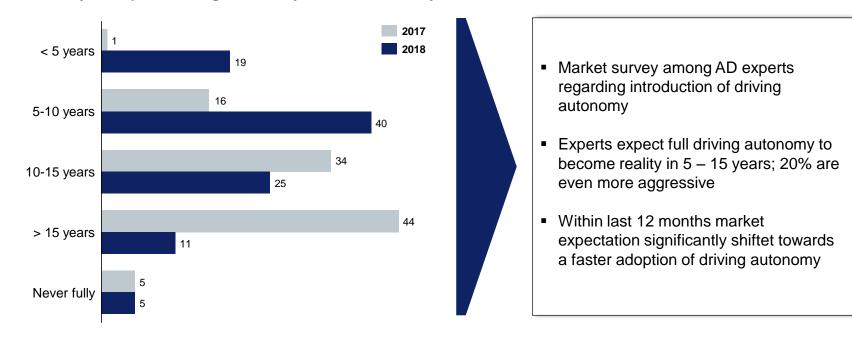


# The process toward full automation and increasing market shares will unfold as a step-by-step evolutionary process

Penetration of advanced driving levels



## When do you expect driving autonomy to become reality for vehicles on the road?

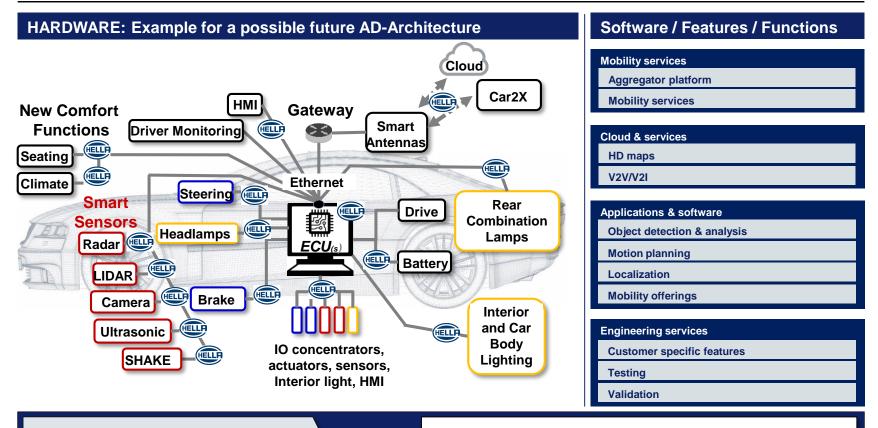


Source: we.CONECT Global Leaders GmbH



# Technologies for new autonomous driving functions open up new potential for HELLA's future business development

HELLA's contribution to Autonomous Driving



- New functional requirements facilitate growth of new sensors
- Transfer of existing applications to other fields
- Combined use of existing technologies



- With core competences in sensing, actuating & lighting functions, HELLA is well positioned for future needs
- Additional business opportunities with Software & Services portfolio



# To seize business potentials, HELLA pursues a clear strategic approach based on three essential pillars

HELLA's strategic approach to Autonomous Driving



# Strategic approach to Autonomous Driving





# HELLA as strong components supplier

 Scalable and costoptimized solutions for assisted and automated driving









# HELLA as Tier 1 system provider & network partner

- HELLA as Tier 1 partner for functions and subsystems (e.g. parking)
- HELLA as integrated network partner for OEMs and Tiers for overall system solutions







# HELLA as service and feature provider

 Services and software solutions in the area of automated driving



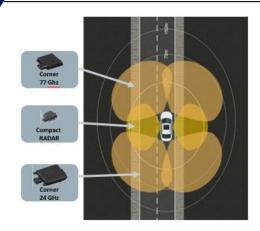
# HELLA offers scalable and cost-optimized solutions for assisted and automated driving e.g. sensing technologies

A. HELLA as a strong components supplier



Market Place

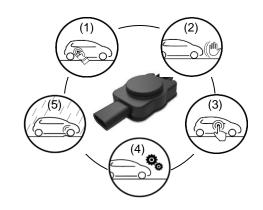
#### 24GHz / 77GHz Radar



Scalable radar family for complete information on vehicle surrounding

- Strong focus on Driver
   Assistance and NCAP relevant functions as driver for surround view
- Consequent modular platform approach to create flexible customer-oriented solutions

### SHAKE\*



Modular system architecture as key technology for intelligent touch & vibration sensing

- Shake sensor for automated driving functions (≥ L2)
- Sensor system allows several low & high speed functions such as damage detection and road condition sensing

#### LIDAR



Scalable LIDAR technologies developed with strong USPs in regard to costs and integration

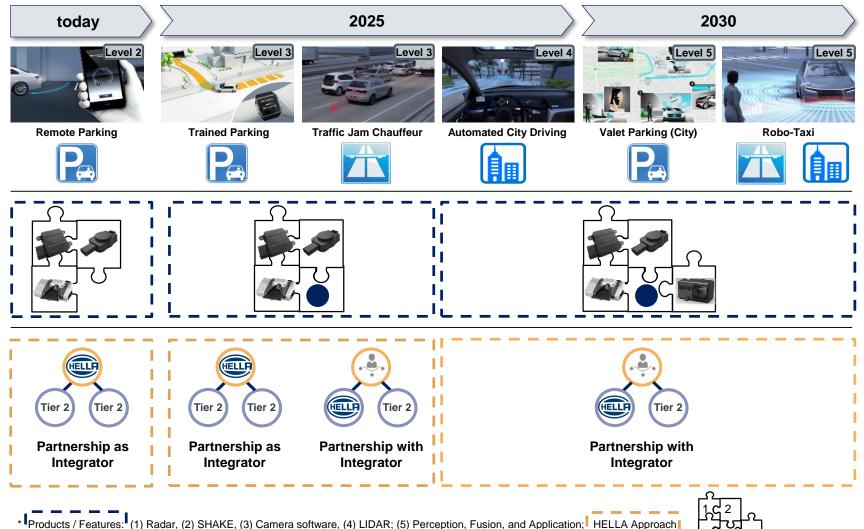
- LIDAR as additional technology for Autonomous Driving
- Tailor made HELLA solution based on existing serial competence

<sup>\*</sup>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 positions itself as development partner for full AD systems and sub-system provider for designated use cases

B. HELLA as Tier 1 supplier and development partner





# In driving the trend to Autonomous Driving, subsidiary HELLA Aglaia plays a key part within the global HELLA network

HELLA Aglaia as software specialist and ideation lab

**HELLA's global** development network for **Autonomous Driving functions** 





USA Silicon Valley

**HELLA Ventures:** Investing in global mobility solutions, partnering with start-ups to bring tomorrow's innovations to life.



Germany Lippstadt

**HELLA HQ:** Development core. origin of state of the art technologies and breeding ground for partnerships with universities



Germany Berlin

**HELLA Ventures** 

Explores disruptive ideas with small entrepreneurial teams to generate proven business opportunities





Germany

Bremen

**HELLA Fahrzeugkomponenten:** 

electromagnetic and electronic

Develops & produces

components



**Germany** Berlin



Among the globally leading developers of intelligent visual sensor systems



China Shanghai

**HELLA China** 

Extended strategic partnership with Plug and Play to cooperate in connectivity and mobility with local start-ups





# HELLA Aglaia boasts a large set of core competences which also includes energy management know-how and people sensing Core competences of HELLA Aglaia

## **HELLA AGLAIA - BUSINESS UNITS**

# DRIVER ASSISTANCE SYSTEMS

# TESTING SOLUTIONS



- Advanced driver assistance systems
- Radar solutions
- Automated driving



- Testing services
- Testing systems
- Data services
- Test & engineering products

# PEOPLE SENSING



 People counting cameras for public transport, retail and security

## ENERGY MANAGEMENT & LIGHTING



- Battery management for full electrical & hybrid vehicles
- Software development for front/rear, car body and interior lighting

# QUALITY & SAFETY



- Software & process quality
- Functional safety

E

Based in Berlin / Since 1998 / 325 Employees / 100% subsidiary of HELLA GmbH & Co. KGaA

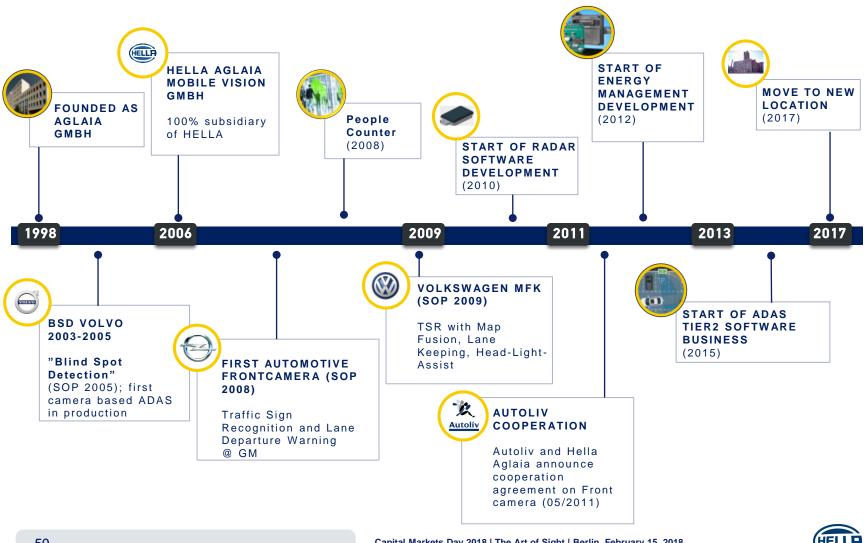


Focus of today



# Since its founding, HELLA Aglaia has accumulated great expertise in camera-based assistance systems and software solutions

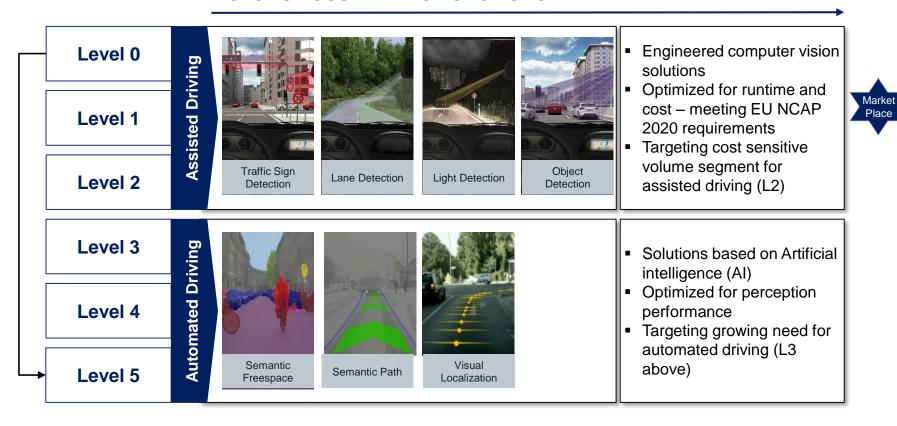
The history of a leading supplier of visual sensor systems



# The road to autonomous driving requires both cost-optimized as well as highly complex, new image processing functions

New technologies for Autonomous Driving functions

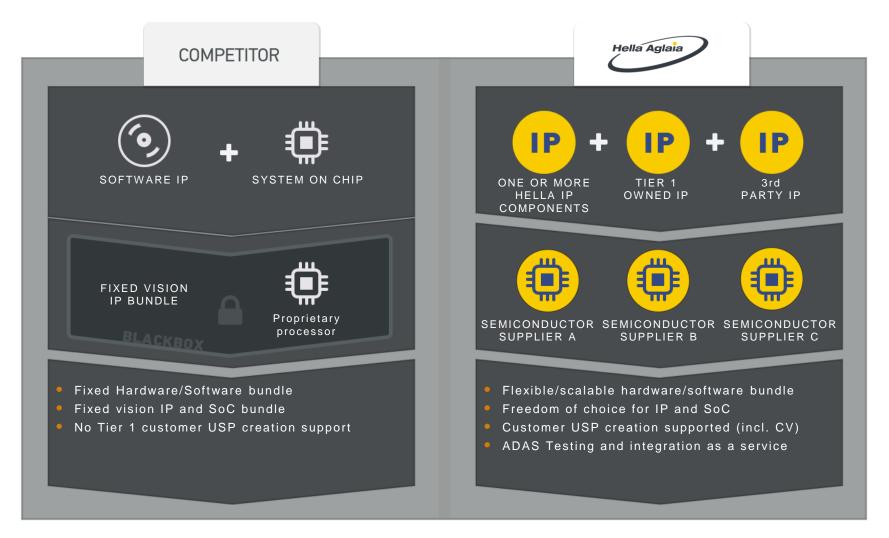
## **AUTONOMOUS DRIVING FUNCTIONS**





# HELLA Aglaia has developed a completely new business model for front camera based ADAS functions

First customer SOP in 2019

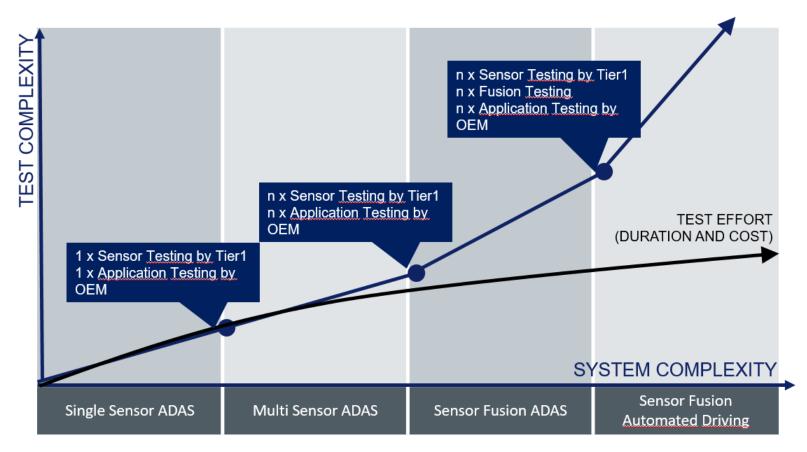




# Thanks to long-lasting expertise, HELLA benefits from increasing demand and complexity in Automotive testing & validation C. HELLA as service and feature provider

Driven by a strong increase in sensors, test complexity and efforts grow exponentially



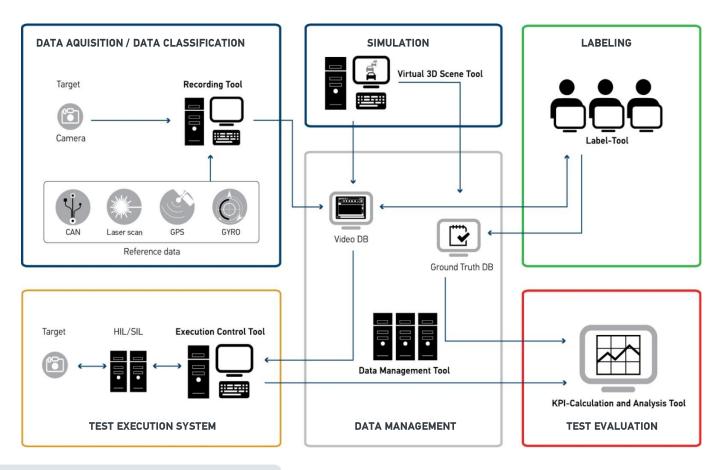




# Due to long-lasting expertise, HELLA benefits from an increasing demand and complexity in Automotive testing & validation C. HELLA as service and feature provider

## Extensive Service and Feature portfolio to face new requirements and challenges







# **Capital Markets Day 2018**

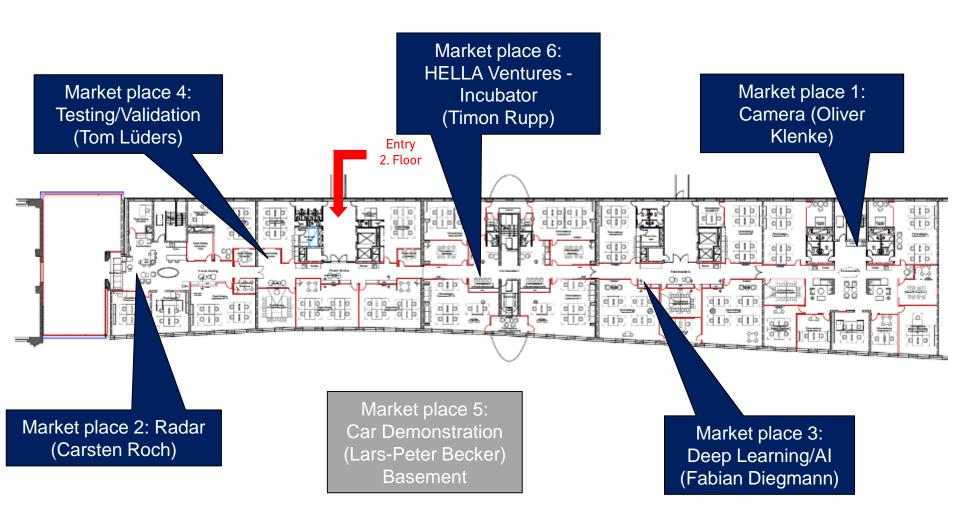
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# Six Deep Dives will provide enhanced insights into the different approaches HELLA is pursuing

**Market Places** 





Place

# Market Place 1: Camera Software

#### **DESCRIPTION**

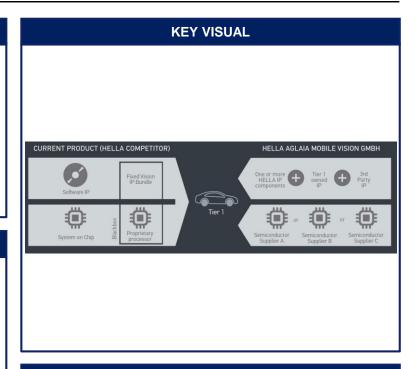
- Advanced computer vision solutions optimized for EU NCAP safety requirements and future autonomous driving
- Main features:
  - Lane Detection
  - Light Source Recognition
  - Traffic Sign Recognition
  - Pedestrian Detection
  - Vehicle Detection

#### **POTENTIAL**

- Lean hardware solution based on single camera technology
- Modular "software as a product" solution
- Entirely flexible and scalable hardware/software bundle
- Customer's freedom of choice leaves room for proprietary USP

#### **OUTLOOK**

 Basis for Automated Driving Level 3 and higher functions involving artificial intelligence



#### **CONTACT PERSON**

## **Oliver Klenke**

Director Driver Assistance Systems Hella Aglaia Mobile Vision GmbH

Location of Marketplace: 2nd floor





# Market Place 2: Radar

#### **DESCRIPTION**

- Radar technology takes an important role in the Automated Driving sensor setup and offers multiple combination possibilities
- HELLA is a specialist for a wide spectrum of customer specific solutions (sensors, technologies, functions, testing) from single components to system solutions
- Newest 77GHz Sensor family as scalable sensor solution for centralized and decentralized component-based architectures
- Compact sensor design for new integration options

#### **POTENTIAL**

- NCAP compatible solution approach with front-side radar (classical radar coverage with 5G1) as well as autonomous lane change functionality by using beam forming (5G5)
- Introduction of elevation measurement
- Optimization of standard Radar functions (BSD, LCA, RCTA) with 77GHz
- Significantly increased measurement performance especially for near-range applications
- Cost effective solutions

#### **OUTLOOK**

 HELLA will not only offer strong HW & SW components, but also subsystem solutions in the field of automated parking.
 In addition, HELLA positions itself as a competent partner for solutions in the field of highly automated driving



#### **CONTACT PERSON**

## **Carsten Roch**

Head of Driver Assistance Systems HELLA GmbH & Co. KGaA

Location of Marketplace: 2nd floor





# Market Place 3: Deep Learning / Artificial Intelligence (AI)

#### **DESCRIPTION**

- Deep Learning is a part of Machine Learning / Al
- Base technology for machine perception by training
- Base technology for big data analytics
- Currently arriving at ADAS and Industry 4.0 markets

#### **POTENTIAL**

- Outperforms humans in many perception tasks
- Core tech for highly automated driving perception
- Next gen. production inspection. Can automate diverse inspection tasks currently done manually
- Allows big data analysis of production data for intelligent error analysis and predictive maintenance

## **KEY VISUAL**



#### OUTLOOK

- Al applications will see a huge growth on the way to L4, L5 highly automated driving
- Al based inspection and analysis of production data will further cut down costs for production tasks that currently require manual inspection

#### **CONTACT PERSON**

# Fabian Diegmann Team Lead Deep Learning Hella Aglaia Mobile Vision GmbH

Location of Marketplace: 2nd floor





# Market Place 4: Testing/Validation

#### **DESCRIPTION**

- Testing solutions for environment sensor systems (camera/radar) and associated products and services
- Validation of Driver Assistance Functions
- Test Development and Data Services

#### **POTENTIAL**

- Growing demand for ready-to-run, turn-key test systems and integrated solutions for validation in context of assisted and autonomous driving
- World wide validation experience in numerous series projects as key differentiator (High entry barrier for competitors)
- With new products and releases as well as enhancements to existing solutions, we want to gain market share and become #1 for ADAS test tools and solutions

#### **OUTLOOK**

- HELLA Aglaia Testing Solutions is developing a complete endto-end solution for validation of ADAS relevant functionalities
- Reduced development and testing efforts by using innovative ADAS testing solutions will help our customers to meet the challenging market expectations

#### **KEY VISUAL**



#### **CONTACT PERSON**

## **Tom Lüders**

Director Testing Solutions Hella Aglaia Mobile Vision GmbH

Location of Market place: 2nd floor





## Market Place 5: Car Demonstration/Test Vehicle

#### **DESCRIPTION**

- Live-Demonstration: Autonomous vehicle
- Special focus on sensors & environment perception
- Introduction of generic functional architecture for automated driving

#### **POTENTIAL**

- Portfolio extension of today's sensors & sensor software
- Offering of software components & subsystems for automated driving systems
- Sensor fusion software for perception of vehicle environment
- Software for maneuver planning & vehicle motion control

# KEY VISUAL

#### OUTLOOK

- Strategic pre-development with selected OEMs as a basis for all relevant aspects of autonomous driving
- Focus on Automated Parking & Urban Mobility/Logistic

#### **CONTACT PERSON**

## **Lars-Peter Becker**

Head of Sensor Solutions Hella Aglaia Mobile Vision GmbH

Location of Market place: Garage (basement)





# Market Place 6: HELLA Ventures – Incubator

#### **DESCRIPTION**

- Embraces the characteristics of the digital VUCA World (volatile, uncertain, complex, ambiguous)
- Turns technology invention into business innovation following an entrepreneurial fast track
- Place to DREAM big, DO it fast and to DISRUPT markets by combining the best of two worlds, corporate & startup

#### **POTENTIAL**

- Grants HELLA early access to disruptive technology and business models
- Nucleus for cultural change within the entire HELLA world
- Contributes to strengthen the HELLA brand in the digital marketplace and its attractiveness as an employer

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#### OUTLOOK

- Will keep spinning-off further high-potential ventures and contribute to a HELLA centric mobility ecosystem
- Will integrate further venturing services for a sustainable, bestin-class service offer to the startup economy
- Will export the incubation model and establish a global innovation network with close proximity to respective markets

#### **CONTACT PERSON**

Timon Rupp CEO Incubator HELLA Ventures Berlin

Location of Market place: 2nd floor







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