Capital Markets Day 2017

The Art of Light – New Paths in the Automotive Lighting Technology

Lippstadt, June 29, 2017
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## Capital Markets Day 2017
### The Art of Light – Lippstadt, June 29, 2017

<table>
<thead>
<tr>
<th>TIME</th>
<th>TOPIC</th>
<th>WHO</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:30</td>
<td>Registration and Welcome</td>
<td>Dr. Kerstin Dodel</td>
</tr>
<tr>
<td>10:00</td>
<td>30 min HELLA Group: HELLA’s Path of Profitable Growth</td>
<td>Dr. Rolf Breidenbach</td>
</tr>
<tr>
<td>10:30</td>
<td>30 min Electronics: Innovation Driver for the Mobility of Tomorrow</td>
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<tr>
<td>11:00</td>
<td>30 min Lighting: New Paths in the Automotive Lighting Technology</td>
<td>Markus Bannert</td>
</tr>
<tr>
<td>11:30</td>
<td>15 min Aftermarket: Unique Position along whole Value Chain</td>
<td>Bernard Schäferbarthold</td>
</tr>
<tr>
<td>11:45</td>
<td>15 min Special Applications: Leveraging of Automotive Strengths</td>
<td>Bernard Schäferbarthold</td>
</tr>
<tr>
<td>12:00</td>
<td>30 min HELLA Group: Financials &amp; Perspectives</td>
<td>Bernard Schäferbarthold</td>
</tr>
<tr>
<td>12:30</td>
<td>45 min Q&amp;A-Session</td>
<td>all</td>
</tr>
<tr>
<td>13:15</td>
<td>45 min Lunch</td>
<td>all</td>
</tr>
<tr>
<td>14:00</td>
<td>40 min Focus Topic: The Art of Light – Digitalization of Lighting with new HD Technologies</td>
<td>Kamislav Fadel</td>
</tr>
<tr>
<td>14:40</td>
<td>20 min Coffee Break and Transfer</td>
<td>all</td>
</tr>
<tr>
<td>15:00</td>
<td>60 min Focus Topic: The Art of Light – Product Demonstration in Light Tunnel</td>
<td>Dr. Michael Kleinkes / Dr. Karsten Eichhorn</td>
</tr>
<tr>
<td>16:00</td>
<td>90 min Focus Topic: The Art of Light – Visit of State-of-the-Art Lighting Plant</td>
<td>Franz-Georg Osdiek / Florian Fischer</td>
</tr>
<tr>
<td>17:30</td>
<td>30 min Closing remarks (expected end ca. 18:00)</td>
<td>all</td>
</tr>
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<td>all</td>
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</table>
We delivered what we have promised
HELLA Group – Where do we come from?

**WHAT WE HAVE PROMISED?**

<table>
<thead>
<tr>
<th>Innovation Leadership</th>
<th>Market Leadership</th>
<th>Resilient Business Portfolio</th>
<th>Operational Excellence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leading technology positions in Automotive, Aftermarket and Special Applications</strong> to tackle major market trends and future customer demands!</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Worldwide development and production footprint</strong> to capture global growth opportunities!</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>International customer portfolio</strong> to strengthen resilience and to capture worldwide growth opportunities!</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Further strengthening of operational excellence</strong> by structural, process- as well as HR-related improvements!</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**KEY ACHIEVEMENTS**

- **SALES**
  - CAGR 2012 → 2016: +8%

- **Adj. EBIT**
  - CAGR 2012 → 2016: +8%

**Examples of Achievements**

- **Innovation Leadership**
  - Highlights: LED Headlamps, Radar, Energy Management, Diagnostic Tools, Work Lights, Modular Lighting Systems

- **Market Leadership**
  - Highlights: 
    - # of new sites since 2012
    - Development: +9
    - Production: +6

- **Resilient Business Portfolio**
  - Highlights: 
    - Sales growth with Asian OEMs
    - ∆2012 → 2016: +16% p.a.

- **Operational Excellence**
  - Highlights: 
    - Reduction of customer line returns thanks to optimized quality management
    - ∆2012 → 2017: -43%

**Note:** Adjustments include restructuring expenses and supplier default (FY 15/16). Please note that where sums and percentages in the presentation have been rounded, differences may arise as a result of commercial rounding.

Over the last years HELLA was 1\textsuperscript{st} to market with several technologies which support strong market positions

Innovation Leadership – Automotive

**SELECTED INNOVATION HIGHLIGHTS**

<table>
<thead>
<tr>
<th>Advanced LED Headlamps</th>
<th>24 Ghz (NB) Radar Sensors</th>
<th>Intelligent Battery Sensors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Global Market Position</strong></td>
<td><strong>Global Market Position</strong></td>
<td><strong>Global Market Position</strong></td>
</tr>
<tr>
<td>#1-2</td>
<td>#1</td>
<td>#2</td>
</tr>
<tr>
<td><strong>Milestones</strong></td>
<td><strong>Milestones</strong></td>
<td><strong>Milestones</strong></td>
</tr>
<tr>
<td>2006</td>
<td>2009</td>
<td>2005</td>
</tr>
<tr>
<td>Cadillac Escalade Platinum: Full-LED headlamp (1\textsuperscript{st} to segment)</td>
<td>Audi Q7: Introduction of Lane Change Assistant (1\textsuperscript{st} Generation)</td>
<td>BMW 5-series: Introduction of first IBS product (1\textsuperscript{st} Generation)</td>
</tr>
<tr>
<td>2010</td>
<td>2012</td>
<td>2008</td>
</tr>
<tr>
<td>Audi A8: Full-LED headlamp with AFS functions (1\textsuperscript{st} to market)</td>
<td>Audi A8: Lane Change Assistant + Pre-Crash Rear (2\textsuperscript{nd} Generation)</td>
<td>Hyundai Sonata: Rollout of IBS product in Korea (2\textsuperscript{nd} Generation)</td>
</tr>
<tr>
<td>2013</td>
<td>2014</td>
<td>2012</td>
</tr>
<tr>
<td>Audi A8: LED Matrix headlamp with glare-free high beam (1\textsuperscript{st} to market)</td>
<td>VW Golf: Blind-Spot Detect + Rear Cross Traffic Alert (3\textsuperscript{rd} Generation)</td>
<td>VW Passat: Global VW platform for IBS product (3\textsuperscript{rd} Generation)</td>
</tr>
<tr>
<td>2016</td>
<td>2017</td>
<td>2015</td>
</tr>
<tr>
<td>Mercedes E-Class: LED Matrix with glare-free high beam (1\textsuperscript{st} to market)</td>
<td>Opel Mokka: Lane Change Assist + Blind Spot Detect (4\textsuperscript{th} Generation)</td>
<td>Honda Accord: Global platform for IBS product (4\textsuperscript{th} Generation)</td>
</tr>
</tbody>
</table>

**Cadillac Escalade Platinum:** Full-LED headlamp (1\textsuperscript{st} to segment)

**Audi A8:** Full-LED headlamp with AFS functions (1\textsuperscript{st} to market)

**Audi A8:** LED Matrix headlamp with glare-free high beam (1\textsuperscript{st} to market)

**Mercedes E-Class:** LED Matrix with glare-free high beam (1\textsuperscript{st} to market)

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**VW Passat:** Global VW platform for IBS product (3\textsuperscript{rd} Generation)

**Honda Accord:** Global platform for IBS product (4\textsuperscript{th} Generation)
HELLA continuously launched new product innovations in its Aftermarket and Special Applications segment

Innovation Leadership – Aftermarket & Special Applications

SELECTED INNOVATION HIGHLIGHTS

Diagnostic Tools

Work Lights

Modular Lighting Systems

Market Position

#1 in Germany

Global Market Position

#1

Market Position

#1 in Europe*

Milestones

2010
Mega macs 66: First diagnostic system with real-time repair concept

Hella Gutmann launches the modular system CSC tool

Hella Gutmann launches mega macs 56

Mega macs tools equip workshops and passenger cars with DoIP applications

2008
Introduction of Power Beam series for halogen replacement

High-power LED work lights with plastic heat sinks set new standards

Q90 LED high-performance work light with plastic cooling elements

New generations of Ultra Beam LED and Oval 100 LED work lights

2010
Modular hybrid combination rear lamp with optional LED modules

First LED 90mm Modular Headlamp

Full-LED rear combination lamps for MAN and DAF Trucks

Launch of modular lamp series Shapeline

* Market leader in Europe with LED 90mm modular headlamps for the Recreational Vehicles segment
Based on its global network HELLA has continuously expanded into new regions and won new customers

**Market Leadership – Global footprint**

**GLOBAL FOOTPRINT**

<table>
<thead>
<tr>
<th>Region</th>
<th>FY 2015/16</th>
<th>Δ2012→2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORTH &amp; SOUTH AMERICA</td>
<td>937 €m</td>
<td>+16% p.a.</td>
</tr>
<tr>
<td># employees</td>
<td>4,690</td>
<td>+13% p.a.</td>
</tr>
<tr>
<td># R&amp;D staff</td>
<td>492</td>
<td>+20% p.a.</td>
</tr>
<tr>
<td># sites</td>
<td>13</td>
<td>+5</td>
</tr>
</tbody>
</table>

**GERMANY**

<table>
<thead>
<tr>
<th>FY 2015/16</th>
<th>Δ2012→2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales in €m</td>
<td>~2,362</td>
</tr>
<tr>
<td># employees</td>
<td>~9,705</td>
</tr>
<tr>
<td># R&amp;D staff</td>
<td>~2,824</td>
</tr>
<tr>
<td># sites</td>
<td>17</td>
</tr>
</tbody>
</table>

**EUROPE w/o Germany**

<table>
<thead>
<tr>
<th>FY 2015/16</th>
<th>Δ2012→2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales in €m</td>
<td>~993</td>
</tr>
<tr>
<td># employees</td>
<td>~5,905</td>
</tr>
<tr>
<td># R&amp;D staff</td>
<td>~1,461</td>
</tr>
<tr>
<td># sites</td>
<td>24</td>
</tr>
</tbody>
</table>

**ASIA / PACIFIC / RoW**

<table>
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<th>FY 2015/16</th>
<th>Δ2012→2016</th>
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<tr>
<td># sites</td>
<td>17</td>
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**KEY ACHIEVEMENTS**

- Since 2012 set-up of 15 new development and production sites to increase customer proximity and capture global growth opportunities
- Strong sales growth in Asia/Pacific/RoW (+18% p.a.) and North & South America (+16% p.a.)

* As of balance sheet date (May 31, 2016)
Based on its global network HELLA has continuously internationalized its customer portfolio.

**Resilient Business Portfolio – Global customer base**

**CUSTOMER PORTFOLIO**

**AUTOMOTIVE**

**KEY ACHIEVEMENTS**

- **Growth with German OEMs** as they play an important role in bringing HELLA innovations to the market.
- **Increasing business with Tier 1 suppliers**, especially in Electronics for subsystems.
- **Further internationalization** of portfolio towards Asia in last years.
- **Highest sales growth with Asian OEMs** (+16% p.a.), **especially with Chinese OEMs** based on local for local solutions in the SUV and Premium segment.
- **Only moderate** sales growth with **US OEMs** due to focused acquisition strategy.

**GROWTH WITH GERMAN OEMS**

- **Increasing business with Tier 1 suppliers**, especially in Electronics for subsystems.

**FURTHER INTERNATIONALIZATION**

- **Towards Asia** in last years.

**HIGHEST SALES GROWTH WITH ASIAN OEMS**

- **(+16% p.a.)**, **especially with Chinese OEMs** based on local for local solutions in the SUV and Premium segment.

**ONLY MODERATE SALES GROWTH WITH US OEMS**

- Due to focused acquisition strategy.

History of growth and sales since FY 2011/2012:

- **German OEMs**: +7% p.a.
- **Asian OEMs**: +11% p.a.
- **TierX**: +1pp
- **US OEMs**: +4% p.a.
- **Other**: -0.1pp

* Including European OEM (ex Germany) and trucks.

Note: Please note that where sums and percentages in the presentation have been rounded, differences may arise as a result of commercial rounding.
By strengthening its operational excellence HELLA further improved its competitiveness in the last years

Operational Excellence

<table>
<thead>
<tr>
<th>LAYER</th>
<th>KEY ACHIEVEMENTS</th>
</tr>
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<tbody>
<tr>
<td>STRUCTURE</td>
<td>▪ <strong>Strong increase of R&amp;D headcount</strong> by more than 35% and <strong>further shift</strong> of R&amp;D headcount share to <strong>best-cost-countries</strong> by approximately 15pp to around 50% in the last five years</td>
</tr>
<tr>
<td></td>
<td>▪ <strong>Further improvement of production footprint</strong>, e.g. by consolidation of production capacities in Germany, relocation of Special Application plant to best-cost-country</td>
</tr>
<tr>
<td></td>
<td>▪ <strong>Strengthening of global corporate center structure</strong>, e.g. in Romania, Vietnam</td>
</tr>
<tr>
<td>PROCESS</td>
<td>▪ <strong>Long lasting improvement programs dedicated</strong> to all <strong>business divisions</strong> continued, e.g. around EUR 250m savings last financial year</td>
</tr>
<tr>
<td></td>
<td>▪ <strong>Stringent quality management</strong>, e.g. customer line return decreased by 43% in the last five years</td>
</tr>
<tr>
<td></td>
<td>▪ Implementation of O365 and <strong>new communication tools</strong> to enable efficient processes and virtual collaboration within global HELLA network</td>
</tr>
<tr>
<td>PEOPLE</td>
<td>▪ <strong>Performance oriented culture</strong> established, e.g. implementation of KPI based bonus system for management, worldwide roll-out of standardized performance appraisal</td>
</tr>
<tr>
<td></td>
<td>▪ <strong>Systematic talent development</strong>, e.g. roll-out of global leadership academy for top management with &gt;400 participants since 2016</td>
</tr>
<tr>
<td></td>
<td>▪ Continuous <strong>employee qualification programs</strong>, e.g. implementation of efficient e-learning platform for worldwide trainings for instance for compliance topics</td>
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</table>
HELLA has shown sustainable profitable growth since automotive crisis

Profitable Growth

SALES in million EUR

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<tr>
<th>Fiscal Year</th>
<th>Sales in million EUR</th>
</tr>
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<tbody>
<tr>
<td>FY 11/12</td>
<td>4,637</td>
</tr>
<tr>
<td>FY 12/13</td>
<td>4,835</td>
</tr>
<tr>
<td>FY 13/14</td>
<td>5,343</td>
</tr>
<tr>
<td>FY 14/15</td>
<td>5,835</td>
</tr>
<tr>
<td>FY 15/16</td>
<td>6,352</td>
</tr>
</tbody>
</table>

ADJUSTED EBIT in million EUR

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Adjusted EBIT in million EUR</th>
<th>Adj. EBIT Margin (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 11/12</td>
<td>350</td>
<td>7.5</td>
</tr>
<tr>
<td>FY 12/13</td>
<td>306</td>
<td>6.3</td>
</tr>
<tr>
<td>FY 13/14</td>
<td>399</td>
<td>7.5</td>
</tr>
<tr>
<td>FY 14/15</td>
<td>445</td>
<td>7.6</td>
</tr>
<tr>
<td>FY 15/16</td>
<td>476</td>
<td>7.5</td>
</tr>
</tbody>
</table>

- **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 structure and **know-how**
- **Overall stable margin level** through growth driven by **technology leadership** and increased efficiency
HELLA is well prepared to accelerate its profitable growth path and to benefit from major market trends

HELLA Group – Profitable growth horizons

**STRATEGIC DIRECTION**

- **Innovation Leadership:**
  Large investments in technologies and products

- **Market Leadership:**
  Expansion of global footprint

- **Resilient Business Portfolio:**
  Internationalization of customer portfolio

- **Operational Excellence:**
  Strengthening of operational excellence

**STRATEGIC ACTION PLAN**

- **A**
  Further expansion of technological excellence and innovation leadership

- **B**
  Foster and maintain leading market positions

- **C**
  Ensure resilience by strong Aftermarket and Special Applications business

- **D**
  Continued focus on operational excellence
HELLA will benefit in its core business thanks to favorable positioning along major automotive market trends
Tailored offering for major market trends

**MAJOR AUTOMOTIVE MARKET TRENDS**

**AUTONOMOUS DRIVING**
- Automated driving sensors for front, side and 360° surround view
- Front camera software
- Advanced front-lighting systems for assistance functions and optical illuminations

**EFFICIENCY & ELECTRIFICATION**
- Electrified fuel system and energy management technologies for all powertrain concepts
- Energy efficient lighting technologies such as LED

**CONNECTIVITY & DIGITALIZATION**
- Connected intelligent sensor technology to connect vehicles with environment
- High definition headlamps with digitalized features

**INDIVIDUALIZATION**
- Individualized optical elements for individual styling with advanced exterior and interior lighting systems
- Passive entry systems for individualized functions
To capture global growth opportunities HELLA will pursue a tailored strategy for key regions
Tailored regional market strategy

<table>
<thead>
<tr>
<th>MARKET DEVELOPMENT</th>
<th>STRATEGIC DIRECTION</th>
<th>FOOTPRINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAFTA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA, CA, MX</td>
<td>Maintain current customers while <strong>building new partnerships</strong></td>
<td>Expansion of production footprint for electronics by <strong>setting-up new plant in Mexico</strong>, especially to cover booked business</td>
</tr>
<tr>
<td>Europe</td>
<td>Push <strong>roll-out of already existing Electronic products</strong>, e.g. Intelligent Battery Sensor and rear radar</td>
<td>Further <strong>localization of R&amp;D capabilities for lighting</strong>, especially to enable complete development of full LED headlamps in Mexico</td>
</tr>
<tr>
<td>China</td>
<td>Bring new products to market, e.g. humidity sensor, illuminated grills, light carpets</td>
<td><strong>Increase development resources</strong> for focus technologies / products, e.g. expansion of camera software team at HELLA Aglaia in Berlin by 100% and construction of <strong>new plant for Electronics in Lithuania</strong></td>
</tr>
<tr>
<td>China</td>
<td><strong>Increase sales share with Chinese OEMs</strong></td>
<td><strong>Extension of electronic plant in Shanghai</strong>, especially for Body Electronics and Energy Management products</td>
</tr>
<tr>
<td>China</td>
<td>Strong growth with products related to electrification and autonomous driving, e.g. Battery Management System, Mild Hybrid Voltage Converters, Radar Systems</td>
<td><strong>Ramp-up of JV HELLA-BHAP Lighting plant in Tianjin in October 2017</strong></td>
</tr>
<tr>
<td>China</td>
<td><strong>Focus on LED lighting solutions</strong>: latest full LED headlamp technology as well as low cost LED solutions for the local market</td>
<td><strong>Increase of local R&amp;D capabilities</strong> for LED and selected electronic products (full system and/or application development know-how)</td>
</tr>
</tbody>
</table>

*Source: IHS (as of June 2017)
Ensure ~25% share in Aftermarket and Special Applications to strengthen and maintain business resilience

Strong Aftermarket & Special Applications business

SEGMENT | STRATEGIC DIRECTION

**AFTERMARKET**

- **Independent Aftermarket**
  - *Product portfolio strengthening*
    - Broaden product base, e.g. sensors
    - Roll-out of central product portfolio into all regions and leverage of successful local products
    - Investigation of cooperation opportunities

- **Wholesale**
  - *Participation in wholesale trends*
    - Benefit of market growth in Eastern Europe
    - Acceleration of growth in e-commerce business
    - Investigation of inorganic growth opportunities

- **Workshop**
  - *Expansion with workshop products*
    - Increase market penetration in main European markets
    - Launch of next generation diagnostics

**SPECIAL APPLICATIONS**

- Push “LEDfication” in all customer segments; especially agriculture, construction bus & coach, and trailer
- Growth in Electrics and Electronics, e.g. further application of Automotive products (e.g. Intelligent Battery Sensor) to requirements of special vehicles
- Drive product innovations by set-up of advanced engineering team
- Use growth opportunities in Americas
- Further optimization of production footprint including capacity ramp-up in best-cost-countries
HELLA will focus on major “enablers” to support its further profitable growth path
Continued focus on operational excellence

**Layer**

**Structure**

- *Further capacity optimization and structural improvements*
  - **Flexible capacity increase** in selected regions, especially in Eastern Europe, China, Mexico
  - **Further investments in corporate functions**, e.g. compliance and data security organization
  - **Balancing of roles and responsibilities** across global HELLA network

**Process**

- *Continuous improvement of operational efficiency*
  - Continuation of **operational improvement programs**
  - Further **standardization of processes** by implementation of Business Process Management
  - Consistent **roll-out of Lessons Learned**, e.g. improvements in assembly and pre-production areas (e.g. line balancing, multi machine handling) from Eastern Europe
  - Usage of **advanced methods/tools for development and validation** purposes, e.g. machine learning

**People**

- *Attractive organization for recruiting and retention of qualified employees*
  - Focus on **attraction and retention of workforce with required skill-sets**
  - Continuous **employee qualifications** (leadership training program, global skill management)
  - **Sharpen employer branding**
  - Implementation of consistent **strategic workforce planning**
Based on the defined strategic action plan HELLA’s aspiration level is to realize a mid-term growth between 5 and 10 percent p.a.

HELLA Group – Strategic outlook

STRATEGIC ACTION PLAN

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

**B** 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)!

**C** Ensure resilience by strong Aftermarket and Special Applications business
- Ensure an approximate 25% share in Aftermarket and Special Applications to maintain and strengthen overall business resilience!

**D** Continued focus on operational excellence
- Continue structural improvements, optimization of operational efficiency and strengthening of HELLA workforce!

**Mid-term sales growth aspiration**

Acceleration of profitable growth and benefiting from major market trends!

- Autonomous Driving
- Efficiency & Electrification
- Connectivity & Digitalization

5-10% p.a.
## Capital Markets Day 2017  
*The Art of Light – Lippstadt, June 29, 2017*

<table>
<thead>
<tr>
<th>TIME</th>
<th>TOPIC</th>
<th>WHO</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Registration and Welcome</td>
<td>Dr. Kerstin Dodel</td>
</tr>
<tr>
<td>10:00</td>
<td>30 min HELLA Group: HELLA’s Path of Profitable Growth</td>
<td>Dr. Rolf Breidenbach</td>
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The electronic segment has been successfully developing over the last years and is main driver of HELLA’s growth path

Segment Electronics – Where do we come from?

### WHAT WE HAVE PROMISED?

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<tr>
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<th>Key Achievements</th>
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<td>Leading positions based on core technologies and innovative business models to tackle major market trends and future customer demands!</td>
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<tr>
<td>Highlights: Pumps, Radar, IBS, APS, BCM</td>
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<td>Highlights: # of new sites since 2011, Development: +5, Production: +3</td>
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<th>Resilient Business Portfolio</th>
<th>Key Achievements</th>
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<td>International customer portfolio and balanced product portfolio to capture worldwide growth opportunities and act towards trends and demand shifts!</td>
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<tr>
<td>Highlights: Share of high growth products, 2016: ~65%</td>
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<th>Operational Excellence</th>
<th>Key Achievements</th>
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<td>Highlights: Customer line returns in parts per million, ( \Delta_{2012 \rightarrow 2017} -90% )</td>
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### Profitable Growth

**SALES**

CAGR 2012 → 2016

\(+10\%\)
In Electronics HELLA will especially focus on further innovations for automotive market trends to foster leading market positions. Segment Electronics – Strategic growth horizons

BUSINESS SEGMENT ELECTRONICS

Profitable growth path

Acceleration of profitable growth and benefiting from major market trends!

TODAY

Laying the basis for further profitable growth!

STRATEGIC DIRECTION

- **Innovation Leadership:**
  Large investments in technologies and products
- **Market Leadership:**
  Expansion of global footprint
- **Resilient Business Portfolio:**
  Internationalization of customer portfolio
- **Operational Excellence:**
  Strengthening of operational excellence

STRATEGIC ACTION PLAN

- **A** Further expansion of technological excellence and innovation leadership
- **B** Foster and maintain leading positions in core markets
- **C** Ensure resilience with balanced customer and product portfolio
- **D** Continued focus on operational excellence

Focus for today
The major automotive market trends offer significantly more opportunities than risks to HELLA’s electronic business Segment Electronics – Benefiting from major market trends

**MAJOR AUTOMOTIVE MARKET TRENDS**

**AUTONOMOUS DRIVING**
- Automated

**EFFICIENCY & ELECTRIFICATION**
- Electrified

**CONNECTIVITY & DIGITALIZATION**
- Connected

**INDIVIDUALIZATION**
- Individualized

**IMPACT ON HELLA**

**Electronic portfolio**

**Scenario:**
- AD level 3 & 4
- FY 2020/21

**UPSIDE POTENTIAL**

- Opportunities for volume and value growth (e.g. ADAS Software, Radar, Body Actuators, Climate Sensors)
- Opportunities for volume and value growth (e.g. DC/DC-Converter, Battery Management System)
- Opportunities for volume growth (e.g. noise sensor) and value growth (e.g. passive entry systems and air quality sensor)
- Opportunities for volume growth for selected HELLA sensors (e.g. gesture control) and passive entry systems

**Focus for today**
- Scenario: AD level 3 & 4
- Scenario: FY 2020/21

~15% negative
- e.g. Fuel Control Module, 12V IBS
The transition from Driver Assistance functions to Automated Driving Functions will happen gradually.

Segment Electronics – Trend overview Autonomous Driving

AUTONOMOUS DRIVING

Level 0: Driver Only (Eyes on, Hands on)
Level 1: Assisted (Eyes on, Hands on)
Level 2: Partial Automation (Eyes on, Hands temporarily off)
Level 3: Conditional Automation (Eyes and hands temporarily off)
Level 4: High Automation (Eyes off, Hands off)
Level 5: Full Automation (Eyes off, Hands off)

MAIN GROWTH DRIVER

Increasing demand for ADAS products, mainly driven by penetration of assistance systems into all car segments.

2025
- Increased number of sensors and higher value products
- Changing E/E architecture and de-bundling of hardware and software

2030
- Highest value added
To participate in autonomous driving trend HELLA focuses on attractive software and sensor solutions

Segment Electronics – Technologies for Autonomous Driving

**AUTONOMOUS DRIVING**

- **Level 0**
  - Eyes on
  - Hands on
  - Driver Only

- **Level 1**
  - Eyes on
  - Hands on
  - Assisted

- **Level 2**
  - Eyes on
  - Hands temporarily off
  - Partial Automation

- **Level 3**
  - Eyes and hands temporarily off
  - Conditional Automation

- **Level 4**
  - Eyes off
  - Hands off
  - High Automation

- **Level 5**
  - Eyes off
  - Hands off
  - Full Automation

**OFFERING**

- **24 GHz Radar Sensor**
  - 2x

- **77 GHz Radar Sensor**
  - 4x

- **Front Camera Software**
  - 1x

- **Lidar Sensor**
  - 1x

- **Shake Sensor**
  - 8x

**CONTENT PER VEHICLE**

- >50 Euro
- >300 Euro
- >400 Euro

Focus for today
Focus on advanced vision IP and development approaches to enable roadmap towards autonomous driving
Autonomous Driving – Technology Highlights (1/3)

Current Assistance Functions (NCAP 2018):

- Level 0: Driver Only
  - Eyes on Hands on
- Level 1: Assisted
  - Eyes on Hands on
  - Partial Automation
- Level 2: Eyes on Hands temporarily off
  - Conditional Automation
- Level 3: Eyes and hands temporarily off
  - High Automation
- Level 4: Eyes off Hands off
  - Full Automation
- Level 5: Eyes off Hands off

Based on Deep Learning

- Traffic Sign Detection
- Lane Detection
- Light Source Detection
- Pedestrian Detection
- Semantic Freespace
- Semantic Path Planning
- Visual Localization

Conventional computer vision approach

TECHNOLOGY
Camera Software: Vision IP

New business model for camera software: Flexible, scalable approach for realization of autonomous driving functionality
Autonomous Driving – Technology Highlights (2/3)

TECHNOLOGY
Camera Software: „Software as Product“

Current Market Model
CLOSED SYSTEM
- Proprietary microprocessor with fixed software package
- System-on-chip and vision IP fixed („blackbox“ approach)
- Limited options for integration and extension of system for customers
- No support for USP creation at customer side

KEY BENEFITS
- Open systems supports various scalable hardware platforms and vision IP from different sources (own IP, 3rd-party IP)
- Freedom of choice at customer side which vision IP and system-in-chip to integrate → creation of USPs possible
- Flexible, scalable approach enables cost-efficient solutions for volume markets

HELLA Approach
OPEN SYSTEM as flexible, scalable package

Software suppliers (vision IP)

Tier 1 IP
One or more HELLA IP
3rd Party IP

Semiconductor suppliers
(system-on-chip)
HELLA's 77 GHz radar sensor solution enables efficient 360° environment recognition for the entire vehicle

Autonomous Driving – Technology Highlights (3/3)

**TECHNOLOGY**

**77 GHz Radar Sensor**

**KEY FACTS**
- Highly integrated RF-CMOS Radar System Chip
- Higher functional object detection performance
- Dimensions: 65 x 61 x 15 mm

**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
The electrification of the drivetrain leads to a variety of vehicle architectures with different costs and CO2 savings.

## EFFICIENCY & ELECTRIFICATION

<table>
<thead>
<tr>
<th>Architecture</th>
<th>CO2 Reduction*</th>
<th>Additional Costs**</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Combustion Engine (ICE)</td>
<td>-10% to -20%</td>
<td>5% to 10%</td>
<td>12V &amp; 48V</td>
</tr>
<tr>
<td>48V Mild Hybrid (MHV)</td>
<td>-30%</td>
<td>50% to 60%</td>
<td>12V &amp;&gt; 120V</td>
</tr>
<tr>
<td>Full-hybrid (FHEV) &amp; Plug-in Hybrid (PHEV)</td>
<td>-100%</td>
<td>30% to 50%</td>
<td></td>
</tr>
<tr>
<td>Battery Electric Vehicle (BEV)</td>
<td>-100%</td>
<td></td>
<td></td>
</tr>
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</table>

### MARKET PENETRATION***

<table>
<thead>
<tr>
<th>Year</th>
<th>69%</th>
<th>28%</th>
</tr>
</thead>
<tbody>
<tr>
<td>today</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>34%</td>
<td>53%</td>
</tr>
<tr>
<td>2025</td>
<td>24%</td>
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* CO2 reduction related to local emissions only
** Assumptions on technical concept for high volume car
*** Source: IHS Engine Forecast, December 2016

*CO2 reduction related to local emissions only
**Assumptions on technical concept for high volume car
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HELLA continues to invest in attractive technologies and products to support electrification of the drivetrain
Segment Electronics – Technologies for Efficiency & Electrification

EFFICIENCY & ELECTRIFICATION

<table>
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<tr>
<th>Content per Vehicle</th>
<th>Internal Combustion Engine (ICE)</th>
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<td>~50 Euro</td>
<td>1x</td>
<td>1x</td>
<td>&gt;400 Euro</td>
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Focus for today

OFFERING

12V Intelligent Battery Sensor

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

Efficiency & Electrification – Technology Highlights (1/2)

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

MAIN FUNCTIONALITIES
- Enhanced Start-Stop
- Engine-Off-Coasting
- Boosting
- High Power Braking
- Backup Energy
- Fuel Economy

Awarded by 3 Customers
HELLA offers the full electronics solution for lithium-ion battery management system

Efficiency & Electrification – Technology Highlights (2/2)

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

TECHNOLOGY

BATTERY MANAGEMENT SYSTEM

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)

MEASURE

- Current
- Cell voltages
- Cell temperatures
- Battery voltages

CONTROL

- Contactor
- Communication
- Limp home
- Pre-charge
To capture global growth opportunities and foster leading market positions a regionally tailored strategy will be pursued.

**Segment Electronics – Leading positions in regional core markets**

### MAJOR MARKET DEVELOPMENTS

#### North & South America
- Increase demand for powertrain efficiencies, e.g. IBS take rates expected to rise
- Trend towards **Autonomous Driving**: investments expected below levels in Europe and Asia

#### Europe
- **CO2 standards and diesel issues drive** market for PHEV and BEV
- Increasing demands for higher level **Autonomous Driving technologies**

#### Asia / Pacific
- **Strong push for BEV** fostered by government regulations and infrastructure investments
- **Autonomous driving for China megacities desired**
- "**Made in China 2025**" strategy

### STRATEGIC DIRECTION – ELECTRONICS

- Focus on **roll-out of Energy Management products**
- Further **market penetration of rear radar**
- **Explore** market potential for **48V product introductions**
- Expansion of production footprint by **set-up of new plant in Mexico**, especially to cover booked business
- ... 

- Drive acquisition and scale R&D footprint to further penetrate **Energy Management products** (e.g. BMS and 48V DC/DC converters)
- Consider **next product launch for 24 GHz sensors** and introduce **77 GHz sensors**
- **Roll-out of Autonomous Driving software**
- Construction of **new plant in Lithuania**
- ... 

- Focus on large JVs of Western OEMs and **increase share with top local Chinese OEMs by 10pp to 40%**
- Develop **local for local solutions for increasing electrification**, e.g. BMS, 48V DC/DC converter
- **Expansion of Electronics plant in Shanghai**, by 19/20 local production for full product portfolio
- ...
HELLA is well prepared to capture further growth potential in electronics by benefiting from major market trends

Segment Electronics – Strategic outlook

BUSINESS SEGMENT ELECTRONICS

STRA战EGIC ACTION PLAN

A  Further expansion of technological excellence and innovation leadership

- Capitalize favorable positioning along automotive market trends!
  - Autonomous Driving: Push 77 GHz radar and new business model for camera software!
  - Efficiency & Electrification: Launch 48 DC/DC Converter and Battery Management system!

B  Foster and maintain leading positions in core markets

- Capture global growth opportunities in attractive markets!
  - North & South America: Consistent roll-out of existing products & technologies!
  - Europe: Focus on innovative solutions for automotive market trends!
  - China: Continue localization and push solutions for increasing electrification!

C  Ensure resilience with balanced customer and product portfolio

- Drive further internationalization of customer portfolio!
  - Increase share with top local Chinese OEMs by 10pp to 40% in China!
  - Establish closer link to Korean OEMs!
  - Explore additional growth potential with US OEMs!

D  Continued focus on operational excellence

- Continue optimization programs and standardization of processes!
  - Improve reliability and efficiency of Time-to-Market organization!
  - Ensure achievements in Design to Cost and re-Design to Cost!
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The lighting segment has successfully developed over the last years, mainly due to its technology leadership and global footprint.

**Segment Lighting – Where do we come from?**

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### KEY ACHIEVEMENTS

- **Innovation Leadership**
  - **Leading positions** based on **core technologies** and **innovative business models** to tackle major market trends and future customer demands!
  - Highlights:
    - LED Headlamp
    - Ambient Interior light
    - Rear lamp
    - Multi lens array

- **Market Leadership**
  - **Worldwide development and production footprint** to capture global growth opportunities!
  - Highlights:
    - # of new sites since 2011
    - Development: + 4
    - Production: + 3

- **Resilient Business Portfolio**
  - **Balanced technology portfolio** to capture worldwide growth opportunities for premium as well as volume markets!
  - Highlights:
    - Share of LED headlamps*
    - 2016: ~30%

- **Operational Excellence**
  - **Continuous optimization programs** to foster operational excellence along three major layers!
  - Highlights:
    - Customer line returns in parts per million
    - Δ2016→2017 -49%

### SALES

**CAGR** 2012 → 2016

+10%

*) relating to HELLA’s headlamp sales
HELLA will focus on further lighting innovations for automotive market trends to foster leading market positions

Segment Lighting – Strategic growth horizons

BUSINESS SEGMENT LIGHTING

Laying the basis for further profitable growth!

TODAY

STRATEGIC DIRECTION

- **Innovation Leadership:** High investments in technologies and products
- **Market Leadership:** Expansion of global footprint
- **Resilient Business Portfolio:** Internationalization of customer portfolio
- **Operational Excellence:** Strengthening of operational excellence

STRATEGIC ACTION PLAN

- **A** Further expansion of technological excellence and innovation leadership
- **B** Foster and maintain leading positions in core markets
- **C** Ensure resilience with balanced customer and product portfolio
- **D** Continued focus on operational excellence

Acceleration of profitable growth and benefiting from major market trends!
HELLA’s lighting products and innovations will play a relevant role for all major automotive market trends

Segment Lighting – Benefiting from major market trends

**MAJOR AUTOMOTIVE MARKET TRENDS**

- **AUTONOMOUS DRIVING**
  - Automated

- **EFFICIENCY & ELECTRIFICATION**
  - Electrified

- **CONNECTIVITY & DIGITALIZATION**
  - Connected

- **INDIVIDUALIZATION**
  - Individualized

**IMPACT ON HELLA Lighting portfolio**

**Focus for today**

- **Need for advanced front lighting systems for AD Level 1 - 3 to improve driver’s visibility**
- **Introduction of new lighting features for L4+, e.g. for communication purposes**
- **Increasing importance of Car Body and Interior Lighting for illumination of autonomous driving vehicles**

- **Increasing demand for LED solutions as energy efficient light source**

- **Further digitalization will drive development of advanced and high-definition headlamps with freely configurable light distributions and additional customer functionalities**

- **Increasing demand for light-based options to communicate e.g. via headlamps, interior and car body lighting**

- **Increasing demand for ambient interior light (e.g. multiple styling features for passengers) and advanced exterior illumination (e.g. welcome scenarios or illuminated grills)**

- **Increasing relevance of styling options will drive demand for advanced lighting technologies (e.g. Holographics with 3D effects and OLED)**

**UPSIDE POTENTIAL**
Innovations in lighting technologies are driven by progress in light sources, sensors, actuators, electronics and software.

Segment Lighting – Trend overview Connectivity & Digitalization

**CONNECTIVITY & DIGITALIZATION**

**LIGHTING GOES DIGITAL**

- **FUNCTIONS**
  - Lighting ECU
  - Vehicle detection
  - Pedestrian detection
  - Radar
  - Lidar

- **SOFTWARE + ELECTRONICS**
  - Lighting ECU

- **SENSORS**
  - Steering angle
  - Front camera

- **OPTICAL SYSTEMS**
  - Reflector
  - Projector
  - Micro-projector
  - Matrix

- **LIGHT SOURCES**
  - Halogen
  - Xenon
  - LED
  - Laser

**Major innovative lighting systems**

1. **LED Low**  
   △2016→2022 >35% p.a.

2. **LED Advanced**  
   △2016→2022 >20% p.a.

3. **LED Advanced next generation**  
   △2016→2022 >20% p.a.

4. **High definition**  
   SOP >2020

* Expected market growth*  
* Global headlamp market (Source IHS as of March 2017 and HELLA)
Further digitalization in lighting technologies will increase HELLA’s content per vehicle
Segment Lighting – Technologies for Connectivity & Digitalization

CONNECTIVITY & DIGITALIZATION

OFFERING

FUTURE CONTENT PER VEHICLE

LED Low
- LED + optical system: 2x
- ECU Basic: 1x
- Camera + Software Control: 1x
- 120 - 200 Euro

LED Advanced
- LED + optical system: 2x
- ECU Advanced: 1x
- Camera + Software Control: 1x
- 200 - 300 Euro

LED Advanced next generation
- LED Matrix Advanced optical system: 2x
- Matrix ECU: 1x
- Camera + Software Control: 1x
- 400 - 700 Euro

High definition
- LCD optical system: 2x
- HD ECU: 1x
- Camera + Software Control: 1x
- Vehicle Sensor Fusion: 1x
- >1000 Euro

Focus for today
HELLA started the roll-out of Advanced LED headlamps as first lighting supplier in 2016

Connectivity & Digitalization - Technology Highlights (1/2)

### TECHNOLOGY

**Advanced LED next generation**

#### KEY FACTS
- First step to high-definition lighting system
- 84 LED Chips in 3 rows
- Adaptive driving beam

#### KEY BENEFITS
- **Allows** a freely configurable light distribution
- **Enables greater illumination** which is up to 2.5 times greater compared with regularly available systems
- **Increased resolution** by a factor of 3.5
- **Superior design options**

#### MAIN FUNCTIONALITIES
- **Glare-free high beam**
- **Electronic bend light in low beam function**
- **Reduced glare** (e.g. from reflections by traffic signs)

Red Dot Award for Trendsetting Design
High definition LCD headlamp accelerates functionalities and customer benefits
Connectivity & Digitalization – Technology Highlights (2/2)

TECHNOLOGY
High definition LCD headlamp

KEY FACTS
- High definition lighting system
- Liquid Crystal with >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
Increasing demand for personalization of vehicles drives growth for light-based design features and functionalities

Segment Lighting – Trend overview Individualization

INDIVIDUALIZATION

### MAIN GROWTH DRIVER

**Standard Package**
- Basic on/off interior light functions

**Advanced Package**
- Static, unicolor illumination of interior vehicle elements (e.g. door panel, legroom, center console)

**High-end Package**
- Dynamic, multicolor illumination of interior as well as exterior vehicle elements

**Innovation Package**
- Sensor based dynamic interior and exterior light functions (e.g. safety and message projections)

**today**

**>2020**

**Volume growth with designable LED technology penetrating in all segments**

**Value growth with more complex interior and exterior light packages** to provide multiple styling functions

**Highest value added**

---

HELLA’s interior lighting and car body lighting portfolio offers tailored solutions for personalized features

Segment Lighting – Technologies for Individualization

INDIVIDUALIZATION

OFFERING

FUTURE CONTENT PER VEHICLE

Standard Package

Advanced Package

High-end Package

Innovation Package

 Courtesy Lamp 1x

 Dome Lamp 1x

 Overhead Console 1x

 Static Ambient Lighting 1x

 Dynamic Ambient Lighting System (basic) 1x

 Multi lens array (basic) 1x

 Grill Illumination 1x

 > 8 Euro

 > 50 Euro

 > 150 Euro

 > 300 Euro

Focus for today

Enhancing user experience and safety with HELLA’s dynamic ambient lighting system
Individualization – Technology Highlights (1/2)

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

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

Individualization – Technology Highlights (2/2)

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
- First to market
To capture global growth opportunities and foster leading market positions, a regionally tailored strategy will be pursued.

### Segment Lighting – Leading positions in regional core markets

#### Major Market Expectations

**North & South America**
- Increasing demand for LED products
- Premium brands demanding high-end technology

**Europe**
- Shorter development cycles
- Customers search for differentiators in terms of technology and styling
- Demand for complex applications

**Asia / Pacific**
- Largest end-customer acceptance for new lighting applications
- Trend to higher tech LED systems for upcoming car gen.
- Chinese OEMs as early & fast adaptors of new innovations

#### Strategic Direction - Lighting

**North & South America**
- Focus on innovation leadership in Europe as high tech breeding ground
- Offer animated functions for Rear Combination Lamps
- Increase modular designs for Car Body Lighting
- Establish development resources with clear customer focus for Interior Lighting

**Europe**
- Push advanced LED headlamp business with US OEMs
- Offer modules for rear combination lamps to handle increasing complexity
- Broaden customer base for car body lighting
- Further localization of R&D capabilities

**Asia / Pacific**
- Focus on LED: fast growth with high and low cost headlamps solutions
- Foster growth in the area of interior lighting and car body lighting
- Further strengthen local R&D capabilities
- Fully leverage Joint Venture business in China
HELLA is well prepared to capture further growth potential in lighting by benefiting from major market trends
Segment Lighting – Strategic outlook

BUSINESS SEGMENT
LIGHTING

STRATEGIC ACTION PLAN

A Further expansion of technological excellence and innovation leadership

Capitalize **favorable positioning along automotive market trends**!
- Connectivity & Digitalization: **Develop new functionalities out of high definition headlamp systems and penetrate LED low cost solutions**
- Individualization: **Push** advanced **interior** and **exterior** illumination

B Foster and maintain leading market positions

Capture **global growth opportunities in attractive markets**!
- North & South America: **Gain market share with top US OEMs**
- Europe: **Successful roll out of HD technologies to customers**
- China: **Push high and low LED solutions and seek further cooperation**

C Ensure resilience with balanced customer and product portfolio

Drive **further internationalization of customer portfolio and explore balanced technology mix**!
- **Stringent allocation of recources** (anchor technologies like Halogen, growth technologies like LED, harvesting like Xenon and development categories like LCD

D Continued focus on operational excellence

Continue **optimization programs and standardization of processes**!
- **Improve assembly and pre-production areas and reduce non-quality expenses**
- **Enhance** and **standardize logistic** processes
# Capital Markets Day 2017

*The Art of Light – Lippstadt, June 29, 2017*

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The Aftermarket segment successfully developed over the last years and contributed to HELLA’s growth path

Segment Aftermarket – Where do we come from?

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<th>WHAT WE HAVE PROMISED?</th>
<th>KEY ACHIEVEMENTS</th>
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<td>Innovation Leadership</td>
<td>Leading positions based on broad product portfolio and innovative services to tackle major market trends and demand shifts!</td>
</tr>
<tr>
<td>Market Leadership</td>
<td>One of the largest international sales and service networks after expansion and portfolio widening!</td>
</tr>
<tr>
<td>Resilient Business Portfolio</td>
<td>Uniquely positioned along major parts in the Aftermarket value chain to address Independent Aftermarket, Wholesale Distribution, and Workshop Products</td>
</tr>
<tr>
<td>Operational Excellence</td>
<td>Continuous optimization programs to foster operational excellence along three major layers!</td>
</tr>
<tr>
<td>Profitable Growth</td>
<td>SALES CAGR 2012→2016 +3%</td>
</tr>
</tbody>
</table>

- 2012 → 2016

+1%
HELLA will use its unique position along the whole Aftermarket value chain to drive further growth
Segment Aftermarket – Strategic growth horizons

BUSINESS SEGMENT
Aftermarket

**Focus for today**

**STRATEGIC DIRECTION**

- **Innovation Leadership:**
  High investments in technologies and products
- **Market Leadership:**
  Expansion of global footprint
- **Resilient Business Portfolio:**
  Internationalization of customer portfolio
- **Operational Excellence:**
  Strengthening of operational excellence

**STRATEGIC ACTION PLAN**

- **A** Provide innovative products/services along whole Aftermarket value chain
- **B** Foster and maintain leading positions in core markets
- **C** Ensure resilience with balanced customer and product portfolio
- **D** Continued focus on operational excellence

**Acceleration of profitable growth and benefiting from major market trends!**

_Laying the basis for further profitable growth!_
IAM keeps strengthening its core product portfolio and seeks further cooperation for third party OE competence
Independent Aftermarket – Strategic action plan

FOCUS ON:

1. Strengthening of HELLA’s OE core products
   - Expand portfolio and leverage own OE know-how with special focus on E/E and more complex products, e.g. radar sensors
   - Shift from crash to wear parts
   - Roll-out of global portfolio into regions and leverage of local portfolio additions

2. Partnership with strong 3rd party OE suppliers for IAM
   - Enhancement of HELLA portfolio by 3rd party OE products and leverage of distribution network and proximity to customers
HELLA’s integrated wholesale concept ensures broad and deep customer reach in order to generate further growth

Segment Wholesale – Strategic action plan

**POSITIONING ALONG VALUE CHAIN**

**STRATEGIC DIRECTION**

Capture chances from digitalization

- Intensification of **E-commerce business** in Denmark and Poland
- Further development of **service platform** in first market Denmark and roll-out to further wholesale markets
- Increase in customer loyalty with **digital solutions**, e.g. connected cars and telematics
- Strengthen **B2C business** and further **end-user services**
HELLA enables workshops to conduct complex repair and maintenance activities with innovative and cost efficient solutions

Workshop Products – Strategic action plan

State of the art workshop equipment to address more complex car

- Provide professional workshop equipment e.g. multi-brand diagnostics, air-conditioning service as well as testing and adjusting tools e.g. for camera and sensor calibration
  
  **Example:** Camera and sensor calibration

- Growing importance of cameras and sensors due to automotive megatrends (e.g. autonomous driving)
- **Easy application** for all brands, smart and cost-efficient solution
- Tool offers independent workshops possibility to extend business activities beyond traditional scope

New cloud-based workshop solutions to solve diagnostic problems

- **Existing diagnostics business model**
  - Localized **offline data base**, not accessible for external parties
  - Technical support offered by **hotline**, e.g. for interpretation of complex failure codes into easy-to-understand failure analysis

- **Cloud platform**
  - HELLA know-how is transferred to a **cloud platform**
  - Third parties can access data base through web services like API
  - **Predictive services** become possible

- **New applications**
  - **New partners** access the data base to offer innovative services and applications for car diagnostics ("micro services")
  - Examples: driver logbooks, pay-per-diagnosis
By strengthening its operational excellence, the segment Aftermarket will further improve its competitiveness.

**Segment Aftermarket – Operational Excellence**

<table>
<thead>
<tr>
<th>LAYER</th>
<th>STRATEGIC DIRECTION</th>
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<tbody>
<tr>
<td>STRUCTURE</td>
<td><strong>Further strengthening of organizational set-up in IAM</strong></td>
</tr>
<tr>
<td></td>
<td>- Further implementation of key account organization to strengthen customer focus</td>
</tr>
<tr>
<td></td>
<td>- Full integration of workshop products organization into IAM organization to</td>
</tr>
<tr>
<td></td>
<td>realize synergies</td>
</tr>
<tr>
<td></td>
<td>- Combination of sales, product, and data management in one organization to</td>
</tr>
<tr>
<td></td>
<td>ensure efficient coordination of business activities</td>
</tr>
<tr>
<td>PROCESS</td>
<td><strong>Continuous improvement of internal processes</strong></td>
</tr>
<tr>
<td></td>
<td>- Optimize order fulfillment process, e.g. by better truck / container utilization,</td>
</tr>
<tr>
<td></td>
<td>consolidation and regionalization of supplier base</td>
</tr>
<tr>
<td></td>
<td>- Push focus on active portfolio management to increase stock rotation and to</td>
</tr>
<tr>
<td></td>
<td>streamline product portfolio as well as use of make-to-order approach</td>
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<tr>
<td></td>
<td>- Further roll out of state-of-the-art IT solutions to increase process quality and</td>
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<td>efficiency, e.g. further roll-out of standard ERP system, full utilization of CRM</td>
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<td>PEOPLE</td>
<td><strong>Continuous focus on recruiting and retention of qualified employees</strong></td>
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<td></td>
<td>- Roll-out of tailored employee qualification programs, e.g. Order Fulfillment</td>
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<tr>
<td></td>
<td>Academy, Leadership Academy</td>
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<td></td>
<td>- Hiring of qualified and skilled people to be prepared for digital challenges</td>
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The Aftermarket segment is an important pillar of HELLA’s further profitable growth path
Segment Aftermarket – Strategic outlook

BUSINESS SEGMENT
AFTERMARKET
STRATEGIC ACTION PLAN

A Provide innovative products and services along whole Aftermarket value chain
- IAM: Strengthen OE product portfolio and seek additional partnerships
  - Wholesale: Further develop digital business models
  - Workshop: Launch new diagnostic tools and (digital) services

B Foster and maintain leading market positions
- Capture additional growth opportunities in Aftermarket!
  - Develop Aftermarket concepts considering future decision makers
  - Investigate inorganic growth opportunities for wholesale business in Europe

C Ensure resilience with balanced customer and product portfolio
- Leverage unique positioning in Aftermarket to attractive markets
  - Roll-out of global IAM product portfolio into all regions and leverage of successful local products
  - Expand wholesale network in Poland
  - Further penetrate European core markets with diagnostics tools and services

D Continued focus on operational excellence
- Continue to focus on improving operational excellence!
  - Strengthening of organizational set-up along whole Aftermarket value chain
  - Continuous improvement of internal processes
## Capital Markets Day 2017
### The Art of Light – Lippstadt, June 29, 2017

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Despite challenging market environment, Special Applications segment contributed positively to HELLA’s development.

### Segment Special Applications - Where do we come from?

#### WHAT WE HAVE PROMISED?

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<th>Leading positions based on core technologies and transfer of OE competence to tackle major market trends and future customer demands!</th>
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<td>Strong market positions as supplier of innovative lighting products in defined target markets based on leverage of LED know-how!</td>
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<td>Resilient Business Portfolio</td>
<td>Broad customer base and regional diversified portfolio to strengthen resilience and to capture worldwide growth opportunities.</td>
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<td>Operational Excellence</td>
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#### KEY ACHIEVEMENTS

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<th>LED Work Lamps</th>
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<td>Market Leadership</td>
<td>#1 positions in Europe</td>
<td>Agriculture</td>
</tr>
<tr>
<td>Resilient Business Portfolio</td>
<td>Sales growth with Indian truck, bus and agro customers</td>
<td>Trailer</td>
</tr>
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<td>Operational Excellence</td>
<td>Non-quality expenses (NQE)</td>
<td>Δ2012 → 2016 -23%</td>
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<th>Sales and EBIT development for Special OE</th>
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<th>EBIT Growth</th>
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<tr>
<td>SALES* CAGR 2012 → 2016</td>
<td>+1%</td>
<td>+4%</td>
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<tr>
<td>EBIT* CAGR 2012 → 2016</td>
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Strategic focus in Special Applications will be on leveraging HELLA’s Automotive know-how and on operational excellence

Segment Special Applications – Strategic growth horizons

BUSINESS SEGMENT
Special Applications

Focus for today

STRATEGIC DIRECTION

- Innovation Leadership:
  High investments in technologies and products

- Market Leadership:
  Expansion of global footprint

- Resilient Business Portfolio:
  Internationalization of customer portfolio

- Operational Excellence:
  Strengthening of operational excellence

STRATEGIC ACTION PLAN

A. Further leverage Automotive technology know-how and portfolio

B. Foster and maintain leading positions in core markets

C. Ensure resilience with balanced customer and product portfolio

D. Continued focus on operational excellence

Acceleration of profitable growth and benefiting from major market trends!

Laying the basis for further profitable growth!
By leveraging HELLA’s Automotive know-how, Special Applications can address major industry trends for special vehicles
Segment Special Applications – Technology leadership

Drive LEDfication in all customer segments

- Further focus on offering of LED solutions and participate in LEDfication trend e.g. in recreational vehicles, trailers and agricultural vehicles
- Invest into innovative product roadmap, e.g. Shapeline and multi-function lamp platform
- Revitalize products e.g. modular work lamps and rear lamps
- Drive advanced engineering e.g. light tunnel and matrix beam

Push further application of Electrics / Electronics

- Transfer and adaptation of electronic automotive know-how to further participate in Electrification trend for special vehicles
- Focus on application of existing Automotive products e.g. pedal sensors
- Extension of Electronics scope e.g. radar solutions for smart farming to avoid collision and to measure seeds and speed

Continuous transfer of OE technology to SOE applications!
In order to strengthen its competitiveness, Special Applications will focus on further improving operational excellence.

**Segment Special Applications – Operational Excellence**

### LAYER

#### STRUCTURE

**Further capacity optimization and structural improvements**
- Continuous strengthening of development organization to ensure application transfer of HELLA’s Automotive know-how
- Further optimization of global production footprint, e.g. by capacity ramp-up in best-cost-countries ("local for global") and plant relocation from Finland to Romania
- Strengthening of worldwide sales organization, e.g. by establishment of global product marketing organization

#### PROCESS

**Strengthen efficiency of internal processes**
- Optimization of internal efficiency in Design and Development, e.g. center of competence structure
- Further roll-out and optimization of IT tools & systems to improve internal processes
- Integration of systematic process for product portfolio optimization and complexity reduction

#### PEOPLE

**Continuous focus on recruiting and retention of qualified employees**
- Hiring of qualified people to further strengthen D&D
- Systematic talent development and worldwide qualification of employees based on clearly defined roles and skill profiles
Special Applications is well prepared to support HELLA’s profitable growth path
Segment Special Applications – Strategic outlook

BUSINESS SEGMENT
Special Applications

STRATEGIC ACTION PLAN

A. Further leverage Automotive technology know-how and portfolio

- Continue to leverage synergies out of Automotive portfolio and capitalize favorable market trends!
  - LEDification: Offer innovative LED solutions for special vehicles
  - Electrification: Expand product portfolio for Electric / Electronics (E/E)

B. Foster and maintain leading market positions

- Enforce development of market leading innovations / products!
  - Strengthening of application engineering
  - Search for attractive cooperation opportunities in E/E
  - Capture additional growth opportunities in Mining, Marine, Forklifts, TierX

C. Ensure resilience with balanced customer and product portfolio

- Capture global growth opportunities in attractive markets!
  - Europe: Defend market position
  - Americas: Enforce organic growth based on lighting portfolio through leverage of best cost country solutions
  - India: Penetrate market based on local for local strategy

D. Continued focus on operational excellence

- Continue to focus on improving operational excellence!
  - Further capacity optimization and structural improvements globally
  - Continuous focus on improving internal process efficiency
  - Complexity reduction
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We delivered what we have promised
Financials – Where do we come from?

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<th>WHAT WE HAVE PROMISED?</th>
<th>KEY ACHIEVEMENTS</th>
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<tr>
<td>Innovation Leadership</td>
<td>Continuous investment in innovative portfolio with high value-added and growth!</td>
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<td>Highlights: R&amp;D Ratio Ø 2012-16 9%</td>
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<td>Market Leadership</td>
<td>Worldwide growth and market outperformance with increasing share outside Europe!</td>
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<td>Highlights: Growth Ø 2012-16 8%-Outperformance Ø 2012-16 4.5pp</td>
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<td>Resilient Business Portfolio</td>
<td>Continuous development of non-auto business and solid financial profile to provide strong fundament for future development!</td>
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<td>Highlights: Share Aftermarket &amp; Special Applications Ø 2012-16 26%-Leverage ratio Ø 2012-16* &lt;1.0x</td>
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<td>Operational Excellence</td>
<td>Continuous measures to facilitate operating leverage with structural improvements, group wide programs and performance oriented culture!</td>
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<td></td>
<td>Highlights: Savings from comprehensive program toolkit 2016 ~ EUR 250m</td>
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SALES
CAGR 2012 → 2016 +8%

Adj. EBIT
CAGR 2012 → 2016 +8%

Note: Adjustments include restructuring expenses and supplier default (FY 15/16). Please note that where sums and percentages in the presentation have been rounded, differences may arise as a result of commercial rounding.
Over the last years HELLA continuously invested to further develop innovation leadership position

Innovation Leadership

R&D Expenditures

- R&D spending driven by successful acquisitions of customer projects which drive future growth
- Specific R&D investments to further develop technology leadership position
- Peak in R&D ratio mid of FY 15/16 reached; slight decrease and stabilization since then

Net CAPEX

- Majority of Net CAPEX share related to investment in customer-specific tools and machinery driven by booked business
- Investment in global footprint to follow best cost country approach and to increase customer proximity
- Reimbursements of customer with inherent volatility
Based on its global network HELLA has continuously expanded into new regions and customers

**Market Leadership**

- **Sales CAGR 2012-16 of 8%, outperforming Light Vehicle production by 4.5pp**
- **Strong sales growth in Asia/Pacific/RoW (+18% p.a.) and North & South America (+16% p.a.)**

*Light vehicle production shows the CAGR for calendar year 2011-2015; Source: IHS (as of March 2017)
HELLA has continuously invested in Aftermarket and Special Applications business and ensured a solid balance sheet

Resilient Business Portfolio

Sales Development Aftermarket & Special Applications

- Aftermarket with positive sales development due to portfolio extension, customer proximity, and expansion
- Steady contribution to group EBIT and FCF
- Special Applications lever core technologies to broad customer base with limited investments and capital allocation; sales development suffered from weak agricultural market
- Industries and Airport Lighting business did not develop according expectations and was divested in FY 15/16

Financial Structure

- Solid balance sheet, with investment grade rating
- Prudent financial policy throughout the cycle with leverage <1x
- Leverage ratio at 0.3x and cash & assets at 842 mill. EUR as April, 2017
By strengthening its operational excellence HELLA further improved its competitiveness in the last years

Operational Excellence

Adj. Gross Profit

- Improvement of Adj. Gross Profit Margin driven by innovative product portfolio
- Development in FY 14/15 mainly due to higher launch costs in Eastern Europe
- Continuous optimization of structures and processes support margin improvements:
  - improvement program focusing on productivity and efficiency increases
  - roll-out of lessons learned in Eastern Europe
  - stringent quality management
  - production relocations to best cost countries

Adj. SG&A

- SG&A development with continuous improvements after FY 12/13 due to strong investments in corporate functions
- Thereafter continuous improvements driven by
  - strengthening cooperate centers in best cost countries
  - using shared service center approach with reduced overhead functions
  - dedicated programs in all business divisions continued
  - systematic roll out of competence and skills management
HELLA has shown sustainable profitable growth since automotive crisis

**Profitable Growth**

**SALES**
in million EUR

<table>
<thead>
<tr>
<th></th>
<th>FY 11/12</th>
<th>FY 12/13</th>
<th>FY 13/14</th>
<th>FY 14/15</th>
<th>FY 15/16</th>
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</thead>
<tbody>
<tr>
<td>Sales</td>
<td>4,637</td>
<td>4,835</td>
<td>5,343</td>
<td>5,835</td>
<td>6,352</td>
</tr>
</tbody>
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**ADJUSTED EBIT**
in million EUR

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<th>FY 12/13</th>
<th>FY 13/14</th>
<th>FY 14/15</th>
<th>FY 15/16</th>
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<tr>
<td>EBIT</td>
<td>350</td>
<td>306</td>
<td>399</td>
<td>445</td>
<td>476</td>
</tr>
<tr>
<td>Margin</td>
<td>7.5</td>
<td>6.3</td>
<td>7.5</td>
<td>7.6</td>
<td>7.5</td>
</tr>
</tbody>
</table>

**CAGR**

- **8%**

**Sustainability and Growth**

- **Sustainable growth** during the last years mainly driven by **Automotive**
- **Aftermarket** and **Special Applications** with positive **growth**
- **Continuous EBIT increase** despite investments in global structures and **R&D**
- **Overall stable margin level** through growth driven by constant **gross margin improvements**
HELLA is well prepared to accelerate its profitable growth path and to benefit from major market trends

Financials – Profitable growth horizons

Laying the basis for further profitable growth!

STRATEGIC DIRECTION

- **Innovation Leadership:**
  High investments in technologies and products
- **Market Leadership:**
  Expansion of global footprint
- **Resilient Business Portfolio:**
  Internationalization of customer portfolio
- **Operational Excellence:**
  Strengthening of operational excellence

FINANCIAL DRIVERS / ACTION PLAN

A. **Continuous R&D and CAPEX** invest for innovation leadership and to drive future growth

B. Continuous organic global sales growth and selective M&A

C. Ensure resilience with a balanced portfolio and strong financing

D. Tailored measures for GPM improvements and stable SG&A FCF generation program to improve cash conversion

Laying the basis for further profitable growth!
HELLA will maintain innovation leadership position and invest in future growth
High focus on R&D and CAPEX efficiency

- R&D investments follow booked business; roughly 70% of R&D spending is related to future projects
- Stable mid term R&D ratio target in view of increased order intakes and conscious investments in opportunities
- 20% of R&D invested in market trends and enhancement of product portfolio
- Areas of investments:
  - Lighting: LED/HD headlamps, Body car & interior lighting
  - Electronics: radar, camera software, LIDAR, energy mgmt.
  - Aftermarket: e-commerce & service platforms and diagnostic tools
  - Special Applications: LED modules and radar solutions
- Low R&D capitalization level < 10%

- CAPEX planning is correlated to expected sales development, investments based on booked business
- CAPEX efficiency is a crucial pillar of HELLA strategy to improve cash flow generation
- HELLA with continuous investment in technologies and innovations: further CAPEX in electronics and lighting facilities and tools reduce CAPEX improvements
- Possible volatility of Net CAPEX due to shifts in reimbursements
- Mid term Net CAPEX level of around 7.5% is targeted

*mid term comprises expected development until FY 19/20
HELLA will continuously focus on improving Free Cash Flow generation
Cash Conversion Project – CAPEX

EFFICIENT CAPITAL ALLOCATION KEY TARGET

CAPEX Cluster

- Projects
- Technical Centers
- Tools
- Plants (universal invest)
- Buildings

Priorities

- Efficiency targets defined to each of these clusters
- Regular meetings with clear decision criteria for investments
- Action tracking on improvement measures for CAPEX efficiency on short and long term
- Results tracked on board level

CAPEX Taskforce and CAPEX Control Board implemented to continuously review all investments
HELLA will show continuous organic global sales growth driven by volume & value add and seeks selective M&A Growth Opportunities

**ORGANIC GROWTH**

*Volume growth* and *value growth* within HELLA product portfolio driven by *booked business* and *trends*

- **ELECTRONICS**
  - Value ~8x
- **LIGHTING**
  - Value ~2x

*Based on presented examples today; estimated increase in value add from bottom to high end of potential content increase*

**INORGANIC GROWTH**

Seeking *selective M&A* opportunities in Europe (Wholesale) and globally (selective technologies and competences in Automotive & Special Applications)

All M&A targets need to add to the overall business and strengthen strategic positioning

---

*Mid term target sales growth between 5%-10% p.a.*
HELLA will ensure resilience with a balanced portfolio and solid financing

Portfolio and Financing

- **Aftermarket** provides innovative technologies and services along the whole Aftermarket value chain
  - Growth opportunities through portfolio optimization, broadened customer reach with e-commerce/ e-service offering and innovative diagnostics
  - Strengthen competitiveness through continuous improvement programs

- **Special Applications** leverages lighting and electronic know-how e.g. with tailored LED modules, IBS and radar to increase growth dynamics and improve long term margins

**Leverage**

**mid term target:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Debt / EBITDA</th>
<th>EBITDA</th>
<th>Cash Flow</th>
<th>Net Debt</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>&lt;1X</td>
<td>300</td>
<td>300</td>
<td>117</td>
</tr>
<tr>
<td>2020</td>
<td></td>
<td>500</td>
<td></td>
<td></td>
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<tr>
<td>2024</td>
<td></td>
<td>300</td>
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<td>2032</td>
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<td>70</td>
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<tr>
<td>2033</td>
<td></td>
<td>105</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020 Other Debt**</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

**Key Points**

- Aftermarket
  - Mid term target: continuous improvement on EBIT and Cash Flow generation

- Special Applications
  - Mid term target: well balanced debt portfolio
  - New issuing (senior, unsecured / bearer debt) for attractive conditions
  - Long term financing secured

**OE business model**

- (product know-how)

**Distributor model**

- (system & process know-how)

**Synergies and innovation**

** OE business model**

- (product know-how)

**Automotive**

**Aftermarket and Special Applications**

- Aftermarket
  - Provides innovative technologies and services along the whole Aftermarket value chain
  - Growth opportunities through portfolio optimization, broadened customer reach with e-commerce/ e-service offering and innovative diagnostics

- Special Applications
  - Leverages lighting and electronic know-how e.g. with tailored LED modules, IBS and radar to increase growth dynamics and improve long term margins

**Net Debt / EBITDA <1X**

- Mid term target: continuous improvement on EBIT and Cash Flow generation

**Abbreviation for “American Family Life Insurance Company”**
HELLA will continuously improve its operational excellence and increase its competitiveness
Continuous focus on improvements

- Localization strategies and global supply base, focus on closing the price cost scissor with respect to materials
- Further reduction of NQE, zero failure aspiration
- Further improvement of project maturity & launch readiness
- Roll-out of lessons learned from Eastern Europe
- Consistent strategic workforce planning
- Further development of corporate center structures
- Further investments in corporate functions, e.g. standardized systems and data management
- New business process management approach for further standardization
- Reorganization of logistics processes
- Continuous employee qualifications
HELLA will continuously focus on improving Free Cash Flow generation
High focus on FCF conversion

<table>
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<tr>
<th>Metric</th>
<th>2015/16</th>
<th>Mid Term Improvement</th>
</tr>
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<tbody>
<tr>
<td>Profitability</td>
<td>7.5</td>
<td>high</td>
</tr>
<tr>
<td>Net CAPEX</td>
<td>7.3</td>
<td>moderate</td>
</tr>
<tr>
<td>Working Capital</td>
<td>15.5</td>
<td>high</td>
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<tr>
<td>Adj. EBIT Margin</td>
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<td>Cash Conversion Project – CAPEX</td>
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<td></td>
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- *Mid term target to increase cash conversion ratio*
- HELLA will *drive Cash Flow generation* with increased profitability, strong WC improvement and *increase CAPEX efficiency*.
- *Significant effect* from Working Capital improvements.

Cash Conversion Ratio = OCF (Operative Free Cash Flow) / EBIT (Earnings before interest)
HELLA will continuously focus on improving Free Cash Flow generation
Cash Conversion Project – Working Capital

- **Working Capital / Sales**
  - **mid term target:** decreasing by 3pp

- **Inventories**
  - DIO 35 days: 608 days, moderate
  - Focus: logistic structure, roles & responsibilities and lead times

- **Receivables**
  - DSO 54 days: 937 days, moderate
  - Focus: payment terms, overdues and tracking tools

- **Payables**
  - DPO 36 days: -634 days, high
  - Focus: negotiation approach and responsibilities

---

- Working Capital with **strong potential** for **improvement**, group wide Working Capital program initiated:
  - clear responsibilities, top management governance, defined structures and targets!
  - concentrates on all layers of working capital: receivables, inventories, and payables!
  - all business divisions involved with tailored actions!
- Potential to reduce Working Capital/ Sales ratio in the next 3 years **by 3pp**!
HELLA will continuously focus on improving Free Cash Flow generation
Cash Conversion Project – Working Capital

**Governance**

**Steering and responsibilities**
- Steering committee: executive management board
- Project lead: CFO
- Project set-up finalized: targets defined, ongoing reviews

**Focus topics on group level**
- Support on data management
- Drive understanding of key figures groupwide
- Improve processes (e.g. liquidity planning)

**DSO**

**Focus: payment terms, overdues and tracking tools**
- Implement worldwide standardized payment terms with clear management approval process
- Implement systematic invoicing delivery process to reduce open billing
- Reorganize overdue tracking and process to create ownership and accountability at the responsible manager
- Implement standard reporting and continuous tracking per local entity – reduction of manual efforts using data warehouse solution

**DIO**

**Focus: logistic structure, roles & responsibilities, and lead times**
- Foster localization of components and finished goods within HELLA production footprint
- Harmonize inbound logistics concepts to production needs with global Purchasing organization
- Implement rolling ISR and target deployment to all order fulfillment leaders
- Reduce lead-times with suppliers and plants

**Further means**
- Review inventory allocation from slow to fast movers
- Global logistic structure and tool landscape for analytics

**DPO**

**Focus: negotiation approach and responsibilities**
- Clear responsibilities with lead-buyer approach to ensure clear responsibilities on "supplier level"
- Clear prioritization: Tailored negotiation approaches for top 200 suppliers

**Further means**
- Usage of HELLA's leverage
- Specific platform for documentation and knowledge-transfer: (planning of activities, documentation of progress and quantification/reporting of results)
- Monthly reviews
Based on the defined strategic action plan, HELLA aspire to realize positive development of its performance indicators.

**Financial – Perspectives**

- **Capitalize** favorable positioning along automotive market trends!
- Benefit from **volume and value growth opportunities** based on strong market position!
- Capture **global growth opportunities in attractive markets** (regions and customers)!
- **Capture** global growth opportunities in attractive markets (regions and customers)!
- Ensure an approximately 25% share in Aftermarket and Special Applications to maintain and strengthen overall business resilience!
- Ensure long term-oriented, balanced financing!
- Continue optimization programs and standardization of processes!
- Improve operating leverage and cash conversion!
- Ensure resilience with balanced portfolio and prudent financing!
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**STRATEGIC ACTION PLAN**

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

**B** 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)!

**C** Ensure resilience with balanced portfolio and prudent financing
- Ensure an approximately 25% share in Aftermarket and Special Applications to maintain and strengthen overall business resilience!
- Ensure long term-oriented, balanced financing!

**D** 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!

**FY 2017/18**
- Sales growth excluding FX between 5-10%
- Adj. EBIT growth between 5-10%
- Adj. EBIT margin around 8%

**Mid term target**
- Sales growth between 5-10% p.a.
- Continuous improvement of adj. EBIT
- Increasing cash conversion
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Digitalization of Lighting with new HD technologies
From candela to digitalization

With the candela technology we were not able to switch the light on and off from the car. There were no switches.

Lighting is older than the automobile

1886 <

No possibility to switch on or off the light from the vehicle
Digitalization of Lighting with new HD technologies
From candela to digitalization

With the first electrical Lamp we introduced the first switch in the automotive lighting. The digital era began.

1886 <

No possibility to switch on or off the light from the vehicle

1908

With the first electrical headlamp
One Light-source = One function = 2 status on/off
1 switch possible

Digital = to represent something with digits

Easiest system: binary system (0 = off, 1 = on)
Digitalization of Lighting with new HD technologies
From candela to digitalization

No possibility to switch on or off the light from the vehicle

With the first electrical Lamp we introduced the first switch in the automotive lighting. The digital era began

The idea to move the beam pattern is also old but the technology was not available.

Some historical cars available, but...
Digitalization of Lighting with new HD technologies
From candela to digitalization

No possibility to switch on or off the light from the vehicle

With the first electrical Lamp we introduced the first switch in the automotive lighting. The digital era began

The idea to move the beam pattern is also old but the technology was not available. The real story began with the AFS initiative in 1992

Dynamic bending light ~ 2003
Using actuators for swiveling of a former static light distribution

General calculation:
~Swiveling for one headlamp: -7.5° to +15° → 22.5° total swivel area
Actuator: (First system introduction ~ 0.3°), current systems ~ 0.1°

~ (75) 220 positions of a former static light distribution possible!

Result: 220 positions x 2 switches + 2 switches = 442 possibilities

… most effect full and recognizable functionality …
Digitalization of Lighting with new HD technologies
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2010
The ADB introduction opened a new era for the digital light

ADB – adaptive Driving Beam (introduction with Xenon)

Adaptive cut-off line

Glare free high beam

H: 440 positions of a former static light distribution possible
V: 400 positions possible (most for smooth transitions)

Result: 440 possibilities (horizontal) x 400 (vertical) + 2 switches = ~176,000 possibilities
Digitalization of Lighting with new HD technologies  
From candela to digitalization

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The ADB introduction opened a new era for the digital light HELLA was the first to introduce the LED ADB on the market on the Audi A8 2013

966 million light distributions due to dimming, pixelation and separation…

MATRIX BEAM 5 reflectors each with a 5-chip-LED

- First glare-free high beam functionality masking out of up to 8 different road users at the same time
- 25 individually controllable segments per headlight
- Vehicles driving ahead are detected in a distance of 300-400m
- Elimination of glare for oncoming vehicles
- Increased safety: 30m more detection distance means 1.3s additional response time
- Reduced driver fatigue due to an automatic system
Digitalization of Lighting with new HD technologies
From candela to digitalization

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The ADB introduction opened a new era for the digital light. HELLA was the first to introduce the LED ADB on the market on the Audi A8 2013

2016
With the introduction of the first HD ADB system to the market on the current E class Hella established the first mile stone of the Pixel Light

TOP FACTS
- Resolution increased by a factor of 3.5
- Ultra-high speed, precision and performance
- Freely configurable light distribution
- Up to 2.5 times greater illuminance compared with regularly available systems

# of possible light distributions is hard to count …

HIGHER RESOLUTION =>
- Precision
- Permanent use of high beam
- Reduced glare
- Glare-free hazard lighting
Digitalization of Lighting with new HD technologies
From candela to digitalization

LIGHTING GOES DIGITAL

FUNCTIONS
- Bend lighting
- AFS
- High beam assist
- Dynamic cut-off
- Glarefree high beam
- Matrix Light
- Marker Light
- Pedestrian Info

SOFTWARE + ELECTRONICS
- Lighting ECU
- Vehicle detection
- 3D Lighting
- Pedestrian detection

SENSORS
- Steering angle
- Front camera
- Radar
- Lidar

OPTICAL SYSTEMS
- Reflectors
- Projectors
- Micro-projectors
- HD Matrix
- Matrix
- Laser

LIGHT SOURCES
- Halogen
- Xenon
- LED
- <1990
- 1992
- 2003
- 2006
- 2009
- 2015
- >2020

Digitalization of Lighting with new HD technologies
Use cases: Mega Trends

Comments

- The acceleration and complexity trend is visible through the constant increase of the car models and options in parallel to more and more technology evolution and growing globalization.

- The Individualization mega trend is driving the product evolution dramatically. The most visible side of this trend is STYLE and use case on demand.

- The Digitalization trend in the Lighting industry is linked to the light pixelization and Software. This is pushing strongly the lighting technologies and enlarging the skill matrix to the electronic and software field.
Digitalization of Lighting with new HD technologies
Use cases: Mega Trends
Digitalization of Lighting with new HD technologies
Use cases: Mega Trends – Motivation Digital Light

“If I had asked people what they wanted, they would have said faster horses.”
—Henry Ford
Digitalization of Lighting with new HD technologies
Use cases: Field of action
Digitalization of Lighting with new HD technologies

Use cases: Resolution

The size of a pixel is classified in 3 different classes: 0,02° -> 0,05°, 0,05° -> 0,1°, 0,1° -> 1°
Digitalization of Lighting with new HD technologies
Use cases: Clusters

1. The beam pattern to adapt to the curves: **Swiveling Low beam**
2. **Cut off on optimal position** in function of the speed to ensure better visibility
3. **Enlarge the beam pattern** if the car is at low speed, sharp curves or stopped and TI
4. **Adapt** the beam pattern to the **bad weather conditions**
5. **Automatic switch to UK, EU and SAE beam pattern**
6. **Automatic referencing** of beam pattern to the 0 position
7. **Adjustable** sharpness of the **cut offs**
8. **Beam’s pattern** shape and intensity **adaptable to the speed**
9. **Advanced Driving Beam (ADB)**

![Diagram showing different beam patterns and their applications](Image)
Digitalization of Lighting with new HD technologies
Use cases: Clusters

---

### Car to Pedestrian

1. **Car pedestrian detection alert by:**
   - Negative ....
   - Marking him with flashing light
   - Marking his feet's, ...
   - A, B, C3
   - B, C3
   - B, C3

2. **Highlight the ‘walkway’ area in the critical situations**
   - E3

3. **Projection of pedestrian path (zebra)**
   - A2
   - in front of the pedestrian and information's that he can cross safely
Digitalization of Lighting with new HD technologies
Use cases: Clusters

13. Project **optical lane assist** allowing the driver to visualize his trajectory

14. **Highlight the driving path** …..

15. Worn about eventual hazards

16. Project **animated navigation information** on the road to maximize the driver sight on the road (Arrows changing the dimension and the shape when getting closer to the crossroad, speed limits)

17. **Illuminate** intelligently the non respected **traffic signs**

---

**Functional** | **Car to Pedestrian** | **Car to Driver** | **Scenery**

---

**Scenery**

1 2 3

0.02° 0.05° 0.1° 1°
Digitalization of Lighting with new HD technologies
Use cases: Clusters

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Car to Pedestrian
Scenery
Digitalization of Lighting with new HD technologies
Use cases: Summary

1. The beam pattern to adapt to the curves
2. Cut off on optimal position in function of the speed
3. Enlarge the beam pattern if the car is at low speed
4. Adapt the beam pattern to the bad weather conditions
5. Automatic switch to UK, EU and SAE beam pattern
6. Automatic referencing of beam pattern to the 0 position
7. Adjustable sharpness of the cut offs
8. Beam’s pattern shape and intensity adaptable to the speed
9. Advanced Driving Beam (ADB)
10. Car pedestrian detection, …
11. Highlight the ‘walkway’ area
12. Projection of pedestrian path
13. Project Optical Lane assist
14. Highlight the driving path
15. Worn about eventual hazards by negative contrast
16. Project animated Navigation information on the road
17. Illuminate intelligently the non respected traffic signs
# Digitalization of Lighting with new HD technologies

**Use cases: Summary**

### STATE-OF-THE-ART FUNCTIONS

- e.g. bend light, glare-free high beam, etc. with optimized end-user impact

### C2P (CAR TO PEDESTRIAN)

- New functionalities e.g. pedestrian marking, guided attention, highlight the walk way etc.

### C2D (CAR TO DRIVER)

- New functionalities e.g. accentuation of driving lanes, optical lane assist, hazard warning, etc.

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<th>Extended driving light</th>
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Ideal technological solution to be selected based on requirements analysis of currently identified use cases for light functions (required resolution, contrast, intensity, illumination zone)
Digitalization of Lighting with new HD technologies
Use cases supported by technology

DIGITALIZATION OF LIGHT

- Holistic environment sensor system as key enabler for new functionalities
- New use cases contributing to car safety and driving comfort
- Implementation of new functions through software updates and software upgrades

NEW HIGH-DEFINITION TECHNOLOGIES

- µAFS (solid state-light) ~4,000 Pixel
- Laser Scanner <10,000 Pixel
- LCD (Liquid Crystal) >50,000 Pixel
- DMD (Digital Mirror Device) >500,000 Pixel
Digitalization of Lighting with new HD technologies
Use cases supported by technology

Beamers: Simulate / show every use case
Reality: Light tunnel environment for beamers

Each Beamer: Luminous Flux 30,000 lm, Illuminance: 240 lx, Viewing Area: H ± 15, V ±10; electrical power 3000 W
Light tunnel: Length: 140 m, Width 11 m, Height: 4,5 m, constant condition with real asphalt

For each functionality / Use case the requirements for resolution, contrast, intensity, etc. can be evaluated in reality.

These results in combination with the technological capability of new HD-technologies can be used to select the appropriate one.
Digitalization of Lighting with new HD technologies
Use cases supported by technology

μAFS (solid state-lighting)
~4,000 Pixel
- Relatively moderate resolution
- Full illumination zone
- Limited presentation of innovative functions

LC-HD (Liquid Crystal)
>50,000 Pixel
+ High resolution
+ Full illumination zone
+ Very Good presentation of innovative functions

DLP (Digital Light Projection)
>500,000 Pixel
+ + Very high resolution
- Reduced illumination zone, combination with high beam module necessary
+ + Very good presentation of innovative functions

LCD-Technology is fitting best for „high resolution“ and biggest area of coverage on the street (balanced flexibility for new functionalities)
Digitalization of Lighting with new HD technologies
Use cases summary: Key take away

→ **Use cases can be clustered**: Functional, Car to pedestrian, Car to Driver and Scenery

→ The use cases are characterized by **2 major physical parameters**: Field and Resolution

→ Define your **use cases** and functionalities **first** then speak **technology**

→ **The customer value is in the use cases**
Digitalization of Lighting with new HD technologies
The art of Light
## Capital Markets Day 2017
### The Art of Light – Lippstadt, June 29, 2017

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Head of Corporate Communications & Investor Relations

Dr. Kerstin Dodel, CFA  
Head of Investor Relations

Office phone       +49 2941 38 - 1349  
Facsimile            +49 2941 38 - 471349  
Mobile phone      +49 174 3343454  
E-Mail                  kerstin.dodel@hella.com  
Internet                www.hella.com