Drivetrain Forum
Future Powertrain Concepts – Magna Powertrain’s Perspectives

Jake Hirsch

... “in control of the powertrain” ...
The World is changing ...

GLOBAL MEGATRENDS
... and so is the automotive industry

- Highly Integrated Systems
- Hybrid Systems
- Mechatronic Modules
- Mechanical Modules
- Numerous Components
Key powertrain market drivers

- CO₂ – regulations
- New Powertrain Architectures
- Global Platforms
- Autonomous driving (V2X)
Looking forward to 2025 …

<table>
<thead>
<tr>
<th><strong>CO₂ G/KM</strong></th>
<th><strong>DIFFERENT HYBRID &amp; ELECTRIC VEHICLE ARCHITECTURES</strong></th>
<th><strong>PERCENT OF LV PRODUCTION WITH PLATFORMS &gt;1M</strong></th>
<th><strong>VEHICLES SOLD WITH DRIVERLESS &amp; SELFDRIVING FEATURES</strong></th>
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<td><strong>75</strong></td>
<td></td>
<td><strong>54</strong></td>
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Source: ICCT (indicative Number), IHS, MPT and ZVEI

October 20, 2016

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Challenging CO₂ emission targets drive new powertrain technologies

*Phase-in: 95% in 2020, 100% in 2021; US includes light-commercial vehicles

Source: Magna Analysis
Looking forward to 2025 …

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Increased complexity in powertrain architectures

**ICE incl. Stop / Start**
- Industry Standard today
- #6

**Mild Hybrids**
- 12% - 30% industry 2025
- #21

**HEV / PHEV**
- 11% up to 22% industry 2025
- #17

**BEV**
- >> 3% industry 2025
- #4

Source: MPT internally
Looking forward to 2025 …

- CO₂ g/km: 75
- Different Hybrid & Electric Vehicle Architectures: 42
- Percent of LV Production with Platforms >1M: 54
- Vehicles Sold with Driverless & Selfdriving Features: 600K

Source: ICCT (indicative Number), IHS, MPT and ZVEI

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### Increase in global platforms

<table>
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<th>Year</th>
<th>Regional</th>
<th>Global &lt; 1 Million</th>
<th>Global &gt; 1 Million</th>
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<td>2016</td>
<td>39%</td>
<td>36.1</td>
<td>91</td>
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<tr>
<td>2025</td>
<td>36.1</td>
<td>60.1</td>
<td>110</td>
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- **CAGR 2.1%**
- **54%**

- **39%** includes all platforms between 0.2M to 0.99M vehicles in at least two production regions.

*Source: IHS Automotive 09.2016*

### Key Points
- **Optimal scale and synergy effects**
- In 2025, ~54% of total vehicle production will be based on 26 global platforms with volumes >1 million units per year.
- **Global presence in the supply chain is required**
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Automated driving behavior opens opportunities for powertrain

Autonomous Cars will drive reasonably well and will be focused on

- Best safety
- Best efficiency
- Best comfort
Supporting the transformation of the automotive industry

E-Drive & Hybrid Transmission Systems
Efficient 4X4 Systems
Mechatronic Systems & Modules
Lightweight Components

Transformation of the Industry

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Thank you