PwC Autofacts®

The turning of the tide – impacts of the automotive transformation on the value chain

Research results on how the automotive transformation will impact value add
October 2018
The automotive transformation will bring more vehicle sales, more value per car, and more business for the automotive value chain – still, there are challenges for OEMs and suppliers.

**Technological Changes**

**More Sales**

- New forms of vehicle capabilities change the existing mobility structure, leading to an increase of demand for new types of mobility.
- Due to new usage patterns, new vehicle demand will increase structurally.

**More Value**

- Social and political impulses drive market demand for alternative powertrain technologies.
- Vehicle component and system costs will shift due to new technologies.

**Increase of Value Add**

- Reorientation of existing manufacturing processes.
- Re-alignment of value-add between OEMs and suppliers.
As mobility is local by nature, so is the expected adaptation of new technologies and mobility patterns between Europe, the US, and China due to political, cultural and technical differences

- Autonomous technologies may not be marketable before 2025, therefore mobility patterns are not expected to change notably until 2030
- Regulatory hurdles and consumer inertia due to large legacy vehicle parc may lead to delayed market adaption
- Electric vehicle penetration increases due to legislative demands after 2020, and receives a significant boost as new mobility forms become established after 2025
- Once available, autonomous technology will have strongest growth by attracting former public-transport users with low prices and high convenience
- Autonomous Robotaxis with limited capabilities from 2025 on, wide-spread level 4/5 adoption after 2028
- Electric vehicle penetration with significant lift due to legislative incentives
The introduction of autonomous driving capabilities will trigger the transformation of individual mobility which will create new ways of using vehicles and increase overall mobility.

Autonomous technology is expected to create **new markets for individual mobility types**, driven by strong mobility demand.

Autonomous vehicles will be **used much more intensely** than conventional cars, **reducing** the duration of their lifecycle and creating **higher replacement demand** in spite of **shrinking overall vehicle fleet**.

<table>
<thead>
<tr>
<th>Person-km per Year</th>
<th>Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

**Self-driven …**

<table>
<thead>
<tr>
<th>Year</th>
<th>Trillions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>208,000</td>
</tr>
<tr>
<td>2020</td>
<td>60,000</td>
</tr>
<tr>
<td>2025</td>
<td>252,000</td>
</tr>
<tr>
<td>2030</td>
<td>286,000</td>
</tr>
</tbody>
</table>

**Autonomous …**

<table>
<thead>
<tr>
<th>Year</th>
<th>Trillions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>13,500</td>
</tr>
<tr>
<td>2020</td>
<td>59,500</td>
</tr>
<tr>
<td>2025</td>
<td>42,000</td>
</tr>
<tr>
<td>2030</td>
<td>93,000</td>
</tr>
</tbody>
</table>

**Lifecycle Mileage | Annual Mileage | Usage Years**

Forecast for 2030 – DE Normal Scenario
The transformation of mobility will all but decrease vehicle sales, while vehicle parc will shrink and new mobility sub-markets will accelerate demand for alternative emission-free drivetrains.

- More intense use of autonomous and shared vehicles
- Quicker replacement creates additional new vehicle demand
- Tech will allow level 4/5 adoption from 2028 on
- Robotaxis with limited use from 2025 on
- Strong legislative push from 2020 on
- Sufficient public charging infrastructure ~2025
- Cost-of-operations tipping point differs by segment and use pattern
As vehicle sales and value per car increase, the total value add of new vehicles will grow accordingly – creating significant overall growth opportunities for the automotive value chain.

The acceleration of market dynamics in the new mobility segments increase volume. Added content for autonomous driving and connectivity create new volume and cost dynamics in new and conventional technologies.

Main growth areas are in E/E, interior and chassis components, as sensing and actuation become more important in all areas of the vehicle. Over the mid-term, electric powertrains create on-top growth opportunities.
While conventional powertrains remain dominant in the mid-term, alternative drivetrains increase total powertrain value add requiring new skills and additional investment.

BEV and PHEV costs are currently elevated by small-scale production but will decrease as volumes grow. As average battery capacity of BEV is assumed to rise – plus autonomous technology – value per car remains higher than pure ICE.

The value add of total powertrain technologies is calculated on the basis of ongoing cost reductions of conventional components, while electric drivetrain components for BEV and hybrid powertrains create significant additional opportunities.
Stricter global CO₂ emission standards require new powertrain technologies. The combustion engine needs significant innovations, especially exhaust system, to reach the new emission requirements.

Even assuming aggressive cost reduction potential, the fast rise of electric drivetrain demand creates significant business opportunities, requiring fast decisions even today – but a long-term strategy and large financial resources.
The foreseeable changes of the automotive value chain will come in several different ways: while evolutionary change is fairly benign, transformational change requires strategic realignments.

The automotive industry has been handling technological progress continuously for over 130 years – mostly as technology leader.

Upcoming changes may require the adaptation of non-automotive technologies and skills – through cooperation, co-opetition or the creation of new business cultures.

Process
Evolutionary developments require suppliers to further develop existing business models in order to remain profitable.
Fully integrated business models of product, technology and machinery allow for seamless adaption to evolutionary changes.

Technology
Transformative influences require action as today’s business models will be strongly modified (disruptive) or replaced (substitutive) in the future.
Substitutional Transformation can lead to obsolescence of entire production areas and competencies of suppliers.
DON’T PANIC: The anticipation of the automotive transformation already influences the interactions between automotive stakeholders over the entire value chain and determines long-term strategies.

Quelle: PwC Autofacts 2018

Big players such as OEMs and large suppliers are creating new markets on top of managing value shifts in existing operations.

Especially family-owned smaller companies can leverage new opportunities for pivotal shifts of business model.

Specialized suppliers are striving to establish dominating positions in critical market segments to elongate business.

Basic technologies will continue to be in demand but fall under increasing per-unit price pressure, requiring permanent adaption.

Stakeholder Map

Transformation (Expectation of ...)

Financial institutions

OEMs

Market development

Suppliers

Business strategy types

Portfolio Realignment

Strategic Pivot

Last Man Standing

Business as Usual

Quelle: PwC Autofacts 2018
The information contained in this report represents the culmination of proprietary research conducted by Autofacts, an analytical group within the PwC Research & Analysis Organisation. All material contained in this report was developed independently of any PwC client relationship and does not represent the firm's view as an auditor to any legal business entity. While every effort has been made to ensure the quality of information provided, no representation or warranty of any kind (whether expressed or implied) is given by PwC as to the accuracy, completeness or fitness for any purpose of this document. As such, this document does not constitute the giving of investment advice, nor a part of any advice on investment decisions. Accordingly, regardless of the form of action, whether in contract, tort or otherwise, and to the extent permitted by applicable law, PwC accepts no liability of any kind and disclaims all responsibility for the consequences of any person acting or refraining from acting in reliance on this document.

© 2018 PwC. All rights reserved. “PwC” refers to PricewaterhouseCoopers LLP (a Delaware limited liability partnership) or, as the context requires, other member firms of PricewaterhouseCoopers International Ltd., each of which is a separate and independent legal entity.