Key trends until 2025

Ricardo BACELLAR
KPMG Brazil Head of Automotive
Key trends until 2025

1. Fuel cell electric vehicles (FCEVs) - 52%
2. Connectivity and digitalization - 50%
3. Battery electric vehicles (BEVs) - 49%
4. Hybrid electric vehicles (HEVs) - 47%
5. Market growth in emerging markets - 47%
6. Creating value out of big data - 44%
7. Mobility-as-a-service/Car sharing - 43%
8. Autonomous and self-driving cars - 41%
9. Platform strategies and standardization of modules - 40%
10. Downsizing of internal combustion engines (ICEs) - 35%
11. Rationalization of production in Western Europe - 31%

Source: KPMG’s Global Automotive Executive Survey 2017
Key trends until 2025

<table>
<thead>
<tr>
<th>#</th>
<th>2016</th>
<th>2017</th>
<th>Percentage of executives rating a trend as extremely important</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>#1</td>
<td>#1</td>
<td>Connectivity and digitalization</td>
</tr>
<tr>
<td>#2</td>
<td>#2</td>
<td>#2</td>
<td>Mobility-as-a-service/Car sharing</td>
</tr>
<tr>
<td>#3</td>
<td>#3</td>
<td>#3</td>
<td>Fuel cell electric vehicles (FCEVs)</td>
</tr>
<tr>
<td>#4</td>
<td>#4</td>
<td>#4</td>
<td>Market growth in emerging markets</td>
</tr>
<tr>
<td>#5</td>
<td>#5</td>
<td>#5</td>
<td>Creating value out of big data</td>
</tr>
<tr>
<td>#6</td>
<td>#6</td>
<td>#6</td>
<td>Autonomous and self-driving cars</td>
</tr>
<tr>
<td>#7</td>
<td>#7</td>
<td>#7</td>
<td>Battery electric vehicles (BEVs)</td>
</tr>
<tr>
<td>#8</td>
<td>#8</td>
<td>#8</td>
<td>Platform strategies and standardization of modules</td>
</tr>
<tr>
<td>#9</td>
<td>#9</td>
<td>#9</td>
<td>Hybrid electric vehicles (HEVs)</td>
</tr>
<tr>
<td>#10</td>
<td>#10</td>
<td>#10</td>
<td>Rationalization of production in Western Europe</td>
</tr>
<tr>
<td>#11</td>
<td>#11</td>
<td>#11</td>
<td>Downsizing of internal combustion engine (ICE)</td>
</tr>
</tbody>
</table>

Source: KPMG’s Global Automotive Executive Survey 2017

Note: Percentages may not add up to 100% due to rounding. | Source: KPMG’s Global Automotive Executive Survey 2017
Key trends until 2025

Total market capitalization (in $bn)

2010

2017

Source: KPMG’s Global Automotive Executive Survey 2017
Key trends until 2025

Total cash position (in $bn)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Cash Position (in $bn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>$300.0bn Top 25 (46% of total)</td>
</tr>
<tr>
<td>2017</td>
<td>Source: KPMG’s Global Automotive Executive Survey 2017</td>
</tr>
</tbody>
</table>

Note: Percentages may not add up to 100% due to rounding | Source: KPMG’s Global Automotive Executive Survey 2017
Powertrain technologies

Ricardo BACELLAR
KPMG Brazil Head of Automotive
Dieter Becker
KPMG Global
Head of Automotive
Executive opinion

**(BEVs) Battery Electric Vehicles**
will fail due to infrastructure challenges.

- Absolutely agree: 22%
- Partly agree: 40%
- Neutral: 20%
- Partly disagree: 12%
- Absolutely disagree: 6%

**(FCEVs) Fuel Cell Electric Vehicles**
will be the real breakthrough for electric mobility.

- Absolutely agree: 33%
- Partly agree: 45%
- Neutral: 16%
- Partly disagree: 5%
- Absolutely disagree: 1%
**Consumers opinion**

**Battery Electric Vehicles (BEVs)**

- Absolutely agree: 23%
- Partly agree: 41%
- Neutral: 20%
- Partly disagree: 12%
- Absolutely disagree: 6%

**Fuel Cell Electric Vehicles (FCEVs)**

- Absolutely agree: 36%
- Partly agree: 43%
- Neutral: 16%
- Partly disagree: 4%
- Absolutely disagree: 1%

Note: Percentages may not add up to 100% due to rounding | Source: KPMG’s Global Automotive Executive Survey 2017
Brazilian executives opinion

(BEVs) Battery Electric Vehicles
will fail due to infrastructure challenges.

<table>
<thead>
<tr>
<th>Absolutely agree</th>
<th>Partly agree</th>
<th>Neutral</th>
<th>Partly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>22% 23%</td>
<td>31%</td>
<td>23%</td>
<td>12% 12%</td>
</tr>
</tbody>
</table>

(FCEVs) Fuel Cell Electric Vehicles
will be the real breakthrough for electric mobility.

<table>
<thead>
<tr>
<th>Absolutely agree</th>
<th>Partly agree</th>
<th>Neutral</th>
<th>Partly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>36% 33%</td>
<td>42%</td>
<td>16%</td>
<td>5% 4%</td>
</tr>
</tbody>
</table>

Note: Percentages may not add up to 100% due to rounding. | Source: KPMG’s Global Automotive Executive Survey 2017
Future of combustion

Internal combustion engines (ICE) will still be more important than electric drivetrains for a very long time.

© 2018 KPMG International Cooperative (“KPMG International”). KPMG International provides no client services and is a Swiss entity with which the independent member firms of the KPMG network are affiliated.

Note: Percentages may not add up to 100 % due to rounding | Source: KPMG’s Global Automotive Executive Survey 2017
Future of combustion

Which powertrain technology would you choose if you were to buy a car over the next 5 years?

- **49%** HYB
- **21%** ICE
- **20%** BEV
- **9%** FCEV

© 2018 KPMG International Cooperative (“KPMG International”). KPMG International provides no client services and is a Swiss entity with which the independent member firms of the KPMG network are affiliated.

Note: Percentages may not add up to 100% due to rounding | Source: KPMG’s Global Automotive Executive Survey 2017
Electric readiness

The one thing that really keeps me away from considering a fully electric car is:

**GLOBAL**

- **Price / Cost**: 35%
- **Charging experience**: 28%
- **Range**: 12%
- **Uncertainty about future tech developments**: 11%
- **Suitability for daily use**: 10%
- **Image**: 3%

**BRAZIL**

- **Price / Cost**: 52%
- **Charging experience**: 19%
- **Range**: 8%
- **Uncertainty about future tech developments**: 12%
- **Suitability for daily use**: 10%

Source: KPMG's Global Automotive Executive Survey 2017
Electric readiness

Pure battery electric vehicles (BEV) will fail due to the challenges related to setting up the required infrastructure.

© 2018 KPMG International Cooperative (“KPMG International”). KPMG International provides no client services and is a Swiss entity with which the independent member firms of the KPMG network are affiliated.

Note: Percentages may not add up to 100% due to rounding. | Source: KPMG’s Global Automotive Executive Survey 2017
Electric readiness

If I buy an electric vehicle I expect the manufacturer of the car to take care of all matters around charging.

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolutely agree</td>
<td>45%</td>
</tr>
<tr>
<td>Partly agree</td>
<td>35%</td>
</tr>
<tr>
<td>Undecided</td>
<td>14%</td>
</tr>
<tr>
<td>Absolutely disagree</td>
<td>4%</td>
</tr>
<tr>
<td>Partly disagree</td>
<td>2%</td>
</tr>
<tr>
<td>Absolutely disagree</td>
<td>0%</td>
</tr>
</tbody>
</table>
Electric readiness

OEMs strategies with regard to charging will be...

- **81%**
  - OEMs create their own charging ecosystem with proprietary technology and services

- **19%**
  - OEMs will not need to take care of the charging infrastructure

- **77%**
  - OEMs create their own charging ecosystem with proprietary technology and services

- **23%**
  - OEMs will not need to take care of the charging infrastructure
### Future of combustion

What is your opinion on the share between ICE, Hybrids, BEV & FCEV in 2030 and 2040?

<table>
<thead>
<tr>
<th></th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICE</td>
<td>90%  (4M)</td>
<td>30%  (37M)</td>
<td>25%  (35M)</td>
</tr>
<tr>
<td>Hybrids</td>
<td>24%  (29M)</td>
<td>24%  (34M)</td>
<td>24%  (30M)</td>
</tr>
<tr>
<td>BEV</td>
<td>21%  (26M)</td>
<td>26%  (37M)</td>
<td>26%  (35M)</td>
</tr>
<tr>
<td>FCEV</td>
<td>140.48M</td>
<td>122.66M</td>
<td>101.58M</td>
</tr>
</tbody>
</table>

#### South America

<table>
<thead>
<tr>
<th></th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICE</td>
<td>90%  (4M)</td>
<td>36%  (2M)</td>
<td>25%  (35M)</td>
</tr>
<tr>
<td>Hybrids</td>
<td>24%  (1M)</td>
<td>24%  (1M)</td>
<td>24%  (2M)</td>
</tr>
<tr>
<td>BEV</td>
<td>21%  (1M)</td>
<td>19%  (1M)</td>
<td>19%  (2M)</td>
</tr>
<tr>
<td>FCEV</td>
<td>4.36M</td>
<td>5.90M</td>
<td>6.94M</td>
</tr>
</tbody>
</table>

Note: Percentages may not add up to 100% due to rounding. | Source: KPMG’s Global Automotive Executive Survey 2017

© 2018 KPMG International Cooperative (“KPMG International”). KPMG International provides no client services and is a Swiss entity with which the independent member firms of the KPMG network are affiliated.
Thank you

Ricardo BACELLAR
Head of Automotive
KPMG in Brazil
rbacellar@kpmg.com.br
(21) 98833-3000
https://br.linkedin.com/in/bacellar