Autofacts®
Trends & Challenges of the Automotive Industry

Automotive Logistics Europe
16 March 2016
2016 Global CEO Survey: Redefining Business Success In A Changing World

Global business leaders see a more divergent and multi-polar world where technology is transforming the expectations of customers and other stakeholders.

Corporate Success
T&L-CEOs

Mood Barometer
T&L-CEOs

Focus on 3 Core Capabilities
Result of CEO-Survey

Most T&L-CEOs agree that business success in the 21st century will be redefined by more than financial profit.

Source: PwC 19th Global CEO Survey: Transportation and logistics industry key findings
Global Issue #1: Oil Prices

While production soars and demand drops, the price outlook for oil remains depressed, with 12-month guidance generally under $50/bbl and 24-month guidance under $55/bbl.

Europe Brent Spot Price FOB*
January 2004 – January 2016 ($ per barrel)

Source: US Energy Information Administration (www.eia.gov), International Energy Agency (www.iea.org)  
*bbl = per oil barrel  
**YoY = Year-Over-Year

January 2016

$29.10 / bbl*

41% YoY**

Lowest monthly average since November 2003 ($28.75/bbl)
**Global Issue #2: Uncertainty In China**

While China failed to meet their initial 2015 GDP projections, the outlook remains positive thanks to growing demand and a number of aggressive measures taken by the Central Government to stimulate economic growth.

**China GDP Growth**

**China Light Vehicle Assembly**

2015 – 2020 (millions)

**Light Vehicle Assembly**

Market Share Brands by Origin (in %)

Source: Oxford Economics, Autofacts 2016 Q1 Forecast Release
Change of Dynamics – or not?
**Global Topline**

Light vehicle assembly is expected to reach 88.2m units in 2015, representing a 2.1% YoY (year-over-year) increase. Autofacts is forecasting 2022 light vehicle assembly to reach 110.7m units, equating to a 3.6% CAGR* from 2015 – 2021.

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**Light Vehicle Assembly**

2014 – 2022 (millions)

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**Regional Contribution to Growth**

2015 – 2022 (percentage share)

- **Americas**
  - North America: 13.6%
  - South America: 4.9%

- **Europe, Middle East & Africa (EMEA)**
  - European Union: 5.5%
  - Eastern Europe: 8.1%
  - Middle East & Africa: 5.0%

- **Asia-Pacific**
  - Developing Asia-Pacific: 65.2%
  - Developed Asia-Pacific: (2.3%)

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**Regional Topline Comparison & Volume Change**

2015 vs. 2022

- Americas: +3.0m
- Europe, Middle East & Africa (EMEA): +1.2m
- Asia-Pacific: +14.5m

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Source: Autofacts 2016 Q1 Forecast Release  
*CAGR = Compound Annual Growth Rate  **Region size not to scale  ***CTG = Contribution to Growth
**Comparison: Sales vs. Assembly 2015**

Global vehicle production and sales are distributed unevenly and create major trade flows and interconnection between market regions.

**Regional Sales and Manufacturing Footprint**

2015 (units in millions)

- **NAFTA**: 17.8m (Sales), 20.6m (Assembly)
- **EU-27**: 18.3m (Sales), 15.8m (Assembly)
- **Germany**: 6.2m (Sales), 3.4m (Assembly)
- **China**: 23.3m (Sales), 23.4m (Assembly)
- **South Korea**: 4.4m (Sales), 1.8m (Assembly)
- **Japan**: 8.6m (Sales), 4.9m (Assembly)
- **ROW**: 10.2m (Sales), 18.5m (Assembly)

Source: Autofacts Analysis, Autofacts 2016 Q1 Forecast Release
**Forecast 2022**

Global net trade flows will become much more balanced between major regions – but net importers will be increasingly disparate and hard to compensate with other freight.

**Regional Sales and Manufacturing Footprint**

2022 (units in millions)

<table>
<thead>
<tr>
<th>Region</th>
<th>Forecast 2022</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAFTA</td>
<td>20.6m</td>
<td>21.0m</td>
</tr>
<tr>
<td>EU-27</td>
<td>19.5m</td>
<td>18.8m</td>
</tr>
<tr>
<td>ROW</td>
<td>19.6m</td>
<td>25.5m</td>
</tr>
<tr>
<td>Germany</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.1m</td>
<td>3.8m</td>
</tr>
<tr>
<td>China</td>
<td>32.3m</td>
<td>31.8m</td>
</tr>
<tr>
<td>South Korea</td>
<td>4.3m</td>
<td>2.1m*</td>
</tr>
<tr>
<td>Japan</td>
<td>8.3m</td>
<td>5.0m</td>
</tr>
</tbody>
</table>

*Source: Autofacts Analysis, Autofacts 2016 Q1 Forecast Release  *estimate
Growth of EU Market
**Europe: The Recovery Journey Continues**

The European fiscal crisis, though still far from resolved, has faded out of public attention and has currently no impact on consumer and industry sentiment. New challenges: especially the refugee crisis, a potential Brexit and volatility of global economies.

**Overview: EU Development**

- Of the 31 EU+EFTA countries, 29 had a positive growth of car sales in 2015. Ireland (29.9%), Portugal (24.9%) and Spain (20.9%) are among the top performers.

- The growth of the Eurozone has continued with YoY GDP growth of 1.6%. This positive development has been driven by increasing private consumption as well as favorable monetary policies.

- A mix of risks and opportunities influences the European economy: Ongoing fiscal struggles, refugee crises and instability of global economies on the one hand, while on the other hand strengthened demand across Europe, lower inflation rates and dropping oil prices

- Based on the ongoing onslaught of new vehicle and technology launches, a generally positive economic outlook and significant pent-up demand, we expect a positive sales development over the next years.

- A bright spot of electric car building in Europe is the German firm StreetScooter. It was founded in 2010. Deutsche Post integrated and acquired the entire entity in 2014, including technology and production facilities. Annual production volume is expected to reach 5,000 units, with 20,000 earmarked to renew DHL’s delivery fleet.

- Audi is expected to start producing its Q6 e-tron quattro in Belgium at the beginning of 2018.

- Additionally, VW is likely to relaunch its upper class sedan, Phaeton, as pure electric vehicle at the end of the decade.

Source: Autofacts 2016 Q1 Forecast Release
EU – 16.6 Million New Light Vehicles Forecasted For 2016

Backed by various supportive factors such as low fuel prices and improving employment expectations, new car sales in the EU are forecasted to grow by 3.7% in 2016, reaching 16.6 million units.

Key Messages

- Europe continues on its recovery journey: Stimulating increased private consumption and spending are improving employment rates and growing disposable income in most European markets.
- Economic Sentiment continued to improve on a broad base, with the overall Euro Area sentiment crossing the 106-point mark.
- Other factors also remain supportive: generally low credit and financing rates, still decreasing fuel prices, improving employment expectations and an ongoing onslaught of new and attractive products.
- Given that a number of potentially limiting factors, including inflation, unemployment, market saturation, have yet to come to fruition and are being combatted with proactive sales tactics, this growth is expected to continue.
- Additionally, new products in expanding segments like compact SUVs will also help to lure vehicle buyers into the new car market.
- Backed by an even more dynamic LCV market growth of 9.1%, light vehicle sales have reached 16.0m units in 2015, and are expected to reach 16.6m in 2016, driven by further growth of 3.7% of the car sector, and 7.5% of the LCV segment.
“Brexit”
The UK As An Important Automobile Country

The UK follows Germany, Spain and France as the 4th biggest Assembler of passenger cars and light commercial vehicles in Europe. In 2015, 1,66 million units has been produced in the UK. The biggest assembler is Nissan with 602k units.

**UK: Market Overview**

<table>
<thead>
<tr>
<th></th>
<th>Rank</th>
<th>Country</th>
<th>2014</th>
<th>2015</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assembly - Global top 15 countries</td>
<td>1</td>
<td>China</td>
<td>22,158,911</td>
<td>23,282,662</td>
<td>5.07%</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>USA</td>
<td>11,540,536</td>
<td>11,917,035</td>
<td>3.26%</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Japan</td>
<td>8,945,003</td>
<td>8,621,330</td>
<td>-3.62%</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Germany</td>
<td>5,838,574</td>
<td>6,170,394</td>
<td>5.69%</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>South Korea</td>
<td>4,317,064</td>
<td>4,359,599</td>
<td>0.99%</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>India</td>
<td>3,585,630</td>
<td>3,789,506</td>
<td>5.69%</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Mexico</td>
<td>3,211,980</td>
<td>3,370,460</td>
<td>4.93%</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Spain</td>
<td>2,338,396</td>
<td>2,717,948</td>
<td>16.23%</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Brazil</td>
<td>2,927,307</td>
<td>2,368,581</td>
<td>-19.09%</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Canada</td>
<td>2,378,983</td>
<td>2,241,073</td>
<td>-5.80%</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>France</td>
<td>1,830,068</td>
<td>2,002,030</td>
<td>9.40%</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Thailand</td>
<td>1,898,139</td>
<td>1,949,215</td>
<td>2.69%</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>United Kingdom</td>
<td>1,583,892</td>
<td>1,664,568</td>
<td>5.09%</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>Czech Republic</td>
<td>1,156,550</td>
<td>1,319,522</td>
<td>14.09%</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>Russia</td>
<td>1,766,043</td>
<td>1,287,365</td>
<td>-27.10%</td>
</tr>
</tbody>
</table>

Source: SMMT

PwC Autofacts ©
Hypothesis: A “Brexit” Could Take Place in different Shapes and Forms

The EU contract does not include an exit of a member nation – the referendum in Great Britain could lead to a pro-forma withdrawal of the EU.

Possible scenarios of “Brexit”

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>EU institutions</th>
<th>EU law/regulations</th>
<th>Monetary union</th>
<th>Banking union</th>
<th>Schengen agreement</th>
<th>EC Treaties</th>
<th>Influence on automotive industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full member</td>
<td>Participation</td>
<td>Automatic conversion</td>
<td>Euro zone</td>
<td>Common Banking Supervision</td>
<td>No visa requirements</td>
<td>4 freedoms</td>
<td>Optimal scenario</td>
</tr>
<tr>
<td>GB today</td>
<td>Participation</td>
<td>Automatic conversion</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>3 freedoms</td>
<td>Restricted optimal</td>
</tr>
<tr>
<td>“Norway scenario”</td>
<td>Observer status</td>
<td>Automatic conversion</td>
<td>X</td>
<td>X</td>
<td>No visa requirements</td>
<td>4 freedoms</td>
<td>Low (positive) effects</td>
</tr>
<tr>
<td>“Switzerland scenario”</td>
<td>Observer status</td>
<td>“Autonomous implementation”</td>
<td>X</td>
<td>X</td>
<td>Restricted</td>
<td>EFTA</td>
<td>Low effects</td>
</tr>
<tr>
<td>“Turkey scenario”</td>
<td>In negotiations</td>
<td>Selective implementation</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Bilateral treaties</td>
<td>Noticeable effects</td>
</tr>
<tr>
<td>“Splendid Isolation-Scenario”</td>
<td>No participation</td>
<td>No implementation</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Significant effects</td>
</tr>
</tbody>
</table>

Source: PwC Autofacts Research

PwC Autofacts ©
Middle East & Iran
**Market Overview – High Potential Goes Hand In Hand With High Volatility**

The final conclusion of the Iran nuclear talks after thirteen years could not only be regarded as a victory for diplomacy but could also support sustainable growth and increasing participation for the Iranian people and the wider region.

**Corporate Success**

- **Positive regional outlook**
  - After two consecutive years of decline, light vehicle assembly in the ME&A region is back in positive territory in 2015 up 13.8% to 2.1m units over 2014.
  - For 2016, Autofacts forecasts a further increase in light vehicle assembly by approximately 7.4% to almost 2.3m units. By 2022, the regional assembly volume is forecasted to reach 3.2 million units.

- **Iran has reached historic agreement**
  - While light vehicle assembly in Iran dropped by 55% from 1.6m units to roughly 730k units from 2011 to 2013, while Iran was again in positive territory with sales assembly growing in the first semester of 2015, it has slightly decreased by 8.0% to 981k units through November 2015.
  - For 2016, Autofacts expects light vehicle assembly to grow by 9.2%, and to almost reach 1.2m mark. Until 2022 assembly volume is assumed to increase further to more than 1.8m units.

- **South Africa, the second largest market after Iran in regards to assembly and light vehicle sales, has shown a mixed performance in recent months.**
  - While new light vehicle and especially car sales are down 4.2% in 2015 with 587k units, light vehicle assembly is up 10.0% to 583k units in the same period driven by increasing vehicle exports (+20.5%), which continue to gain momentum.
  - For 2016, Autofacts expects assembly to grow again by 2.6% to 598k units and assembly volume is assumed to increase further to above 672k units by 2022.

**Light Vehicle Sales by Country**

<table>
<thead>
<tr>
<th>YTD Nov 2014 vs. YTD Nov 2015 (thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>YTD Nov 2014</td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td>Morocco</td>
</tr>
<tr>
<td>-</td>
</tr>
</tbody>
</table>

**Diverse situation in South Africa**

- (5%)
- (10%)
- (15%)
- (20%)
- (25%)
- (30%)
- (35%)
- (40%)
- (45%)
- (50%)
- (55%)
- (60%)
- (65%)
- (70%)
- (75%)
- (80%)
- (85%)
- (90%)
- (95%)
- (100%)

**Corporate Success**

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Implementation of the JCPOA Marks the Beginning of a New Phase for Iran’s Economy

After the lifting of sanctions, Iran offers fundamental growth potential, but needs significant investments.

Overview: Iran

**General**
- Huge population of around 80 million people
- Young population with 55% under the age of 30
- Sanctions reduced after implementation day in January 2016

**Economic**
- High inflation rate of currently 13.8%
- High interest rate of over 20%
- High unemployment rate of 11%

**Automotive**
- Low car density of about 200 vehicles per 1,000 inhabitants
- Median age of vehicles on the road in Iran is over 20 years
- LV assembly could be above 2.2m units by 2021

• The implementation of the Joint Comprehensive Plan of Action (JCPOA) on 16th January 2016 marked the beginning of a new phase in relation between Iran and the IAEA. Thus, the lifting of sanctions against Iran was announced.

• Parliamentary elections in 2016 and presidential elections in 2017 mark important miles in the turnaround of Iran’s economic development

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• For 2016, Autofacts expects light vehicle assembly to grow by 9.2%, and to almost reach 1.2m mark. Until 2022 assembly volume is assumed to increase further to more than 1.8m units.

• Despite the expected increase of the Iran market, the market growth is forecasted not to be booming extremely:
  - Automotive retail and service structures of Western OEMs virtually inexistent or outdated since 1979
  - Low oil prices continue to weigh heavy on government finances
  - Existing, complex economic system will continue
  - Development of financial sector under structural insecurity
**Comparison: Iran vs. Germany**

Although the size of population is nearly commensurate, the German and Iran economics and landscape show wide differences. The current economic situation in Iran is basically depending on the development of the crude oil price.

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Iran (IR)</th>
<th>Germany (DE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population 2015</td>
<td>78.5m</td>
<td>81.5m</td>
</tr>
<tr>
<td>Unemployment Rate 2015</td>
<td>11%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Real GDP Growth 2015</td>
<td>2.2%</td>
<td>1.7%</td>
</tr>
<tr>
<td>New light vehicle sales** 2013 vs. 2014</td>
<td>+32.8%</td>
<td>+3.2%</td>
</tr>
<tr>
<td>Population under 30 y. 2015</td>
<td>&gt;50%</td>
<td>30%</td>
</tr>
<tr>
<td>Internet users 2015</td>
<td>35.3</td>
<td>77.6</td>
</tr>
<tr>
<td>Inflation Rate 2015</td>
<td>13.8%</td>
<td>0.3%</td>
</tr>
<tr>
<td>LV Production Volume 2014 vs. 2015</td>
<td>+14%</td>
<td>+6%</td>
</tr>
<tr>
<td>LV Assembly Capacity Utilisation 2015</td>
<td>56%</td>
<td>93%</td>
</tr>
<tr>
<td>Mobile phone users 2015</td>
<td>86.2</td>
<td>&gt;85</td>
</tr>
<tr>
<td>Base Interest Rate 2015</td>
<td>21%</td>
<td>0.05%</td>
</tr>
</tbody>
</table>
High Potential Automotive Market Growth Dampered By Structural Rigidities

Iran is the Middle East’s largest car producer. The country is significant as sales market and production base for its domestic market, but also the wider Middle East.

Iran: Assembly Plants

Total operational capacity ~ 2,150k

Source: Autofacts 2016 Q1 Forecast Release

*Zagross Khodro, Diar Automobile, Morattab Khodro
Russia & Turkey – Risk Profile
**Market Overview – Russia And Turkey**

Eastern Europe – The region’s biggest market, Russia, decreased by -35.7% for the full year 2015. Turkey, as the region's second biggest market, experienced a turn for the better in 2015 reflecting a sales development of YTD of 26.1%.

- **Regional outlook diverse**
  - New vehicle sales and registrations within the Eastern European region showed diverse developments during the whole year 2015. Per December, the Russian market declined 35.7%, while the Turkish market expanded by 26.1%.

- **Russia & Turkey**
  - Key drivers of the country’s weak economy are low exports, consumer uncertainty, weakness of middle-class demand, and a weak Ruble exchange rate combined with high inflation and excessive interest rates.
  - Additionally, the Russian decrease in sales is driven by the political conflicts regarding Ukraine which caused the EU embargo and a rising conflict between Turkey and Russia after Russian’s engagement in the Syrian crisis.

- **Demand in Russia collapsing**

- **Oil-price crisis**
  - At the beginning of January the oil-price slipped below $30 to new 12-year low. As Russia is still highly dependent on the energy sector, the oil-price crisis is reflecting an enormous downside risk for the future market development.

- **Boost in Turkish LV production and sales**
  - In Turkey, which is representing around a fourth of Eastern European assembly, the improving consumer sentiment and the connected pent-up demand in the course of a volatile political year led to a significant pick-up in 2015.
  - So the market shows a very positive development of YTD 26.1% in December. Until 2022 Turkey's production output is expected to account for more than 1.5m units.
Assembly Outlook – Measures Need To Be Taken, Especially In Russia

Russia, the dominating production country in the region, is facing political and economic challenges and therefore underutilized plants, excess capacity remains an issue throughout the Eastern European region.
Whither from here?
The Future Paths Of The Automotive Industry Environment: Customer Behaviour And Regulation

What is the scenario underlying your corporate plan? How fit are you for a change of coordinate? Can you serve several scenarios at the same time?

- Self driving accelerates
- Shared mobility
- Electric Chauffeurs
- Connectivity creates new champions
- Liberal regulatory environment
- Restrictive regulatory environment
- Private usage
- Local business models prevail

Source: Re-Inventing the Wheel
Thank you for your attention!

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**Autofacts – Methodology**

*Providing a complete and detailed industry outlook*

**Macroeconomic Metrics**
- Unemployment
- GDP
- Housing
- Consumer Confidence

**Industry Data**
- Sales
- Inventory
- Assembly History
- Incentives

**Market Intelligence**
- Sector Trends
- Industry Knowledge
- Competitive Landscape
- Product Planning

**Disruptive Events**
- Natural Disasters
- Product Recalls
- Mergers & Acquisitions
- Consumer Perception

Utilising proprietary forecasting methodology, Autofacts sales & assembly balancers track & weigh numerous industry variables.

The collective knowledge and experience of Autofacts is leveraged to finalize forecast assumptions that serve as a building block for our product & service offerings.
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