Outlook

Global Auto Outlook
Industry at Crossroads?

Jeff Schuster, President Global Vehicle Forecasts
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Global short-term external risk factors

- After 2018 contraction, slower global momentum may start to negatively impact individual markets
- China, US and WE could may not be strong enough to support positive global volume growth and are ones to watch
- Global LV sales expected to return to positive growth but momentum risk is high.

- Tariffs and a trade war remain a significant concern for autos.
- USMCA, South Korea deals all but done, while China, EU, and Japan talks linger as a next steps.
- EU premium groups remain at greatest risk if not settled. 25% tariff on EU imported vehicles, could lower US sales by 200k.
- Brexit concern is back in focus after WLTP rolls out (CO2 emission test). Hard Brexit probability has increased to 40%.
  - Could add £1.8bn to the cost of exports and £2.7bn to the cost imports, annually.
  - UK LV market could shrink by nearly 15% and threaten domestic and continental plants while undermining JIT business models.
- EPA proposed freezing CAFE standard at 2020 level. States led by California suing EPA.
  - EU CO2 emissions increased in 2017, putting 2021 target in Jeopardy.
  - China NEV credit starts in 2019 (modified version of ZEV).
  - Many moving parts but likely enables EV growth...if consumers buy.
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2019 outlook is clouded after decline in 2018

- World 2019 forecast: 95.4 mn, Up 750k units from 2018.

- North America: -2% in 2019 (2017: -2%, 2018: 0%)
- Western Europe: 3% in 2019 (2017: 1%, 2018: 0%)
- C&E Europe: 8% in 2019 (2017: 2%, 2018: 2%)
- China: 2% in 2019 (2017: 2%, 2018: -4%)
- Asia Pacific minus China: 5% in 2019 (2017: 4%, 2018: 1%)

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Global Segments – Trucks grow in 2019

**SUV** sales forecast to drive industry growth across sizes and markets

**Car** segment under pressure after 5% decline in 2018, continuing decline

Pickups with Ranger and HD growth in NA + PSA/Renault LCV gains drive increase in **trucks**

Aging Hongguang and other Chinese MPVs pull down **MPV** segment offset by some stable FCA volume

Decline in NA Sporty drives global pullback as models age

Total Premium recovery continues globally, as SUVs grow by 9% (46% share) Cars contract by 3%
Broad-based 2019 LV production growth to 95.6mn

- Global volume growth is 1% or up 1mn units from 2018, after weak 2H18
Global BEV sales cross 1mn in 2018 to 1.2mn, up 55% from 2017.
Global xHEV sales were up 20% to 3.3mn in 2018.
Japan is by far the leader in electrification at 25% in 2018, almost all full hybrid.
World: China Dominates BEV Sales

BEV Sales, Global PV and US Light Truck Market

- NEV subsidies continue to keep China on top with 61% of BEVs.
- Many more brands will take to the China BEV stage, but many will fail or be consolidated into larger groups/
- With tougher FE standards and (generally) better incentives, Europe is moving to BEV fast, but Tesla pre-orders kept US higher last year.
- Europe greatly exceeds USA in total electrified technologies, including conventional FHEV with nearly 1mn units, 250k more than the US.
Global CAGR 2.6% from 2018-2025, with all growth concentrated in emerging markets – 61% of demand by 2025.

Mature markets expected to be flat with CAGR at 0.2%

Emerging is the growth and the risk with CAGR 4.4% - India and Russia outperform.
US LV demand at crossroads

Baseline – Flat post peak
- CAGR ‘17-25 of -0.3%.
- + and – variable offset.
- + = economy, replacement, new households.
- - = used car prices, interest rates, tighter credit, trade policy uncertainty.
- Trade has marginal impact.

Negative – Mild auto recession
- Vol. down -11% from base – CAGR -0.6%.
- Economic slowdown and could turn negative.
- Negative trade impact or trade war.
- Used car substitution severe, .
- Recovery hampered by lower density growth.

Outperform – 2x boost
- CAGR still only +0.3%.
- Near-term boost from fiscal stimulus and lease maturities.
- Prolonged economic growth and wealth impact.
- Technology driven increase in mid-term as market transitions.
Long-term global production growth favors emerging also

- Asia CAGR 3% - Outpaces slightly – Sourcing balance shifts to China, but trade risk impacting some decisions
- Europe CAGR 2% - EE and CE drive growth; WE flat.
- NA CAGR 1% - Growth restarts post 2020 with investment.
- SA CAGR 4% - Region expected to recover from lows, but risk remains.
- MEA CAGR 6% - Growth to fill capacity but sanctions lowering expectations?
NA capacity utilization is a concern for some

<table>
<thead>
<tr>
<th>OEM</th>
<th>NA Plants</th>
<th>2018</th>
<th>2019</th>
</tr>
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<tbody>
<tr>
<td>GM</td>
<td>18</td>
<td>72%</td>
<td>76%</td>
</tr>
<tr>
<td>Ford</td>
<td>12</td>
<td>81%</td>
<td>75%</td>
</tr>
<tr>
<td>Toyota</td>
<td>12</td>
<td>95%</td>
<td>92%</td>
</tr>
<tr>
<td>FCA</td>
<td>11</td>
<td>92%</td>
<td>87%</td>
</tr>
<tr>
<td>Honda</td>
<td>9</td>
<td>89%</td>
<td>89%</td>
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<tr>
<td>RNM</td>
<td>6</td>
<td>79%</td>
<td>78%</td>
</tr>
<tr>
<td>Daimler</td>
<td>4</td>
<td>90%</td>
<td>96%</td>
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<tr>
<td>Hyundai-Kia</td>
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<tr>
<td>VW</td>
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<td>71%</td>
<td>76%</td>
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<tr>
<td>BMW</td>
<td>2</td>
<td>81%</td>
<td>81%</td>
</tr>
<tr>
<td>Subaru</td>
<td>2</td>
<td>91%</td>
<td>100%</td>
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</tbody>
</table>
New models drive production growth in North America

-1.8mn
+2.2mn
+0.8mn

2017-2025 Growth

Existing Entries  Localized  New Entries

2017-2025 Growth

Asian  Domestic  European

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Global BEV pipeline - model choice widens

We have to build them…consumers don’t have to buy?

- Acceleration of BEV launches is coming Recent years have not seen much BEV model activity, but this will change
- Significant jump 2019-21 as the next wave of BEVs arrives, many on platforms optimised for EV
World: China remains the biggest single BEV market

Global PV and US Light Truck market

2018 BEV Sales ('000s)
- China: 734
- Europe: 180
- USA: 1953
- Other: 89

2030 BEV Sales (millions)
- USA: (1.2)
- Other: (3.6)
- Europe: (6.1)
- China: (7.1)

In 2030:
- 18mn total BEV sales
- 17% of global market
- China: 39% of BEV total
- 48% total electrification
- 52mn total electrified units
Many things to be solved before shared AVs can work

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>External</th>
<th>Human</th>
<th>Commercial</th>
<th>Frameworks</th>
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<tbody>
<tr>
<td>Sensor Arrays</td>
<td>Legacy Vehicles</td>
<td>Acceptance (Safety)</td>
<td>Cost of Mobility by Distance</td>
<td>Industry Standards</td>
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<tr>
<td>Sensor Fusion</td>
<td>Connectivity</td>
<td>User Expectations</td>
<td>Infrastructure Investment Cost</td>
<td>Privacy</td>
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<td>3D Maps</td>
<td>Cyber Security</td>
<td>Meeting Peak Demand</td>
<td>Competing R&amp;D (with Electric)</td>
<td>Regulatory Standards</td>
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<tr>
<td>Localisation</td>
<td>Complexity of Cities</td>
<td>Human Driver Deterioration</td>
<td>Mobility Provider Business Model</td>
<td>Legal Liability Issues</td>
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<td>Decision Making</td>
<td>Bad Weather, Poor Conditions</td>
<td>AV 'bullying' or Gaming</td>
<td>Vehicle Cost</td>
<td>Insurance</td>
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<td>Ethics &amp; Morality</td>
<td>Blackspots: GPS and Mobile</td>
<td>Driver Intervention</td>
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<td>City Planning Policy</td>
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<tr>
<td>Battery Tech and Charging</td>
<td>Fleet Control Systems</td>
<td>Resistance to Change</td>
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<td>Transport Integration</td>
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<tr>
<td>Other Infrastructure</td>
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Central AV forecast through 2050

- L0-3 Still expected to account for 45% of global sales in 2050 – higher concentration in Emerging Markets.

- Overall impact on LVs not expected to by more than 10% drop.

![Graph showing Central AV forecast through 2050]
Concluding remarks

- The global outlook tipped negative for first time since Great Recession, but some recovery is expected in 2019.
- Increased level of uncertainty across the regions centered on trade, political risk and economic cycles.
- US long-term picture is stable but market expected to decline at topline.
- NA production growth expected to restart, but still capacity issues as new localization and entries launch.
- Evs will feed Avs as both technologies grow, but Avs for masses still much further out.
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Thank you

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