At a Plateau?

Strategies For An Industry Facing Revolutionary Shifts

SAA Automotive Outlook Conference– January 8th, 2017

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Industries We Serve

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**INFORMATION**  
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**Expertise**  
Deep, detailed, in-market intelligence

**Analytics**  
Providing scalable insight on what really matters
Contents

• Light Vehicle Outlook
• New Considerations – Strategy Amidst Many Moving Parts
• Summary
IHS Markit is supporting clients in these uncertain times by examining 3 possible scenarios that may emerge from the Trump Administration.

**Scenario- 1** assumes President keeps his word with his "Contract with the American Voter" (CAV)

**Scenario- 2** assumes President moderates his view and adopts a more traditional GOP approach to the issues

**Scenario- 3** assumes Business as Usual (BAU) and anticipates continued political gridlock
Global growth is expected to rise modestly in 2017 as US/EU economies strengthen and Brazil/Russia start a slow recovery.

**World Economic Growth Rates**

*LOW INFLATION ECONOMY*

Weak demand + abundant supply driving commodity prices lower, impacting trade.

Source: IHS Markit

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Crude Oil and Natural Gas Prices

- Crude oil, WTI (Left scale)
- Natural gas, Henry Hub (Right scale)

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## Global LV Production Outlook

Over 70% of Total Growth From Emerging Asia

<table>
<thead>
<tr>
<th>Region</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2023</th>
<th>CTG 2016-23</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>24.0</td>
<td>27.1</td>
<td>27.1</td>
<td>27.8</td>
<td>32.5</td>
<td>39%</td>
<td>• Tier 3 &amp; 4 city growth</td>
</tr>
<tr>
<td>Europe</td>
<td>20.9</td>
<td>21.5</td>
<td>21.9</td>
<td>22.1</td>
<td>23.2</td>
<td>12%</td>
<td>• Slow rebound of Russia and shift from West EU</td>
</tr>
<tr>
<td>NA</td>
<td>17.5</td>
<td>17.8</td>
<td>17.6</td>
<td>18.0</td>
<td>18.5</td>
<td>5%</td>
<td>• New capacity (Mex), D3 re-alignment</td>
</tr>
<tr>
<td>South Asia</td>
<td>8.0</td>
<td>8.3</td>
<td>8.6</td>
<td>9.2</td>
<td>12.5</td>
<td>31%</td>
<td>• India domestic &amp; export, ASEAN rise</td>
</tr>
<tr>
<td>Japan/Korea</td>
<td>13.3</td>
<td>12.8</td>
<td>13.2</td>
<td>12.9</td>
<td>12.2</td>
<td>-3%</td>
<td>• Slow domestic mkts, production co-location</td>
</tr>
<tr>
<td>South America</td>
<td>3.1</td>
<td>2.7</td>
<td>2.8</td>
<td>2.8</td>
<td>4.0</td>
<td>9%</td>
<td>• Well below 2013 record of 4.5 mil</td>
</tr>
<tr>
<td>Middle East/Africa</td>
<td>2.0</td>
<td>2.3</td>
<td>2.4</td>
<td>2.7</td>
<td>3.2</td>
<td>7%</td>
<td>• Focus of more attention by OEMs</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>88.7</td>
<td>92.7</td>
<td>93.5</td>
<td>95.6</td>
<td>106.4</td>
<td>CTG – Contribution to Growth</td>
<td></td>
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</tbody>
</table>
Market peaks in mid-2017 – weaker buying conditions, slower job creation, rising oil prices start next cycle. Some return to ‘cars’ likely next decade.

Pre-Crash 40 year trend: +140k annually

Car – sales flatten - rises with as affordability declines

Light Truck – peaks in 2018, weaker housing, higher fuel & regulations force decline

<table>
<thead>
<tr>
<th>Model Count</th>
<th>2010</th>
<th>2016</th>
<th>2023</th>
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</thead>
<tbody>
<tr>
<td>Count</td>
<td>335</td>
<td>371</td>
<td>409</td>
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</table>

Source: IHS Markit Automotive, current light vehicles sales forecast

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Divergent Trajectories – NA LV Production
Detroit Three Volume Leveled in 2016

<table>
<thead>
<tr>
<th>Year</th>
<th>Detroit 3</th>
<th>All Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>8.2</td>
<td>9.3</td>
</tr>
<tr>
<td>2016</td>
<td>9.2</td>
<td>8.7</td>
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<tr>
<td>2017</td>
<td>8.7</td>
<td>9.0</td>
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<tr>
<td>2019</td>
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<td>9.3</td>
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<tr>
<td>2021</td>
<td>8.8</td>
<td>9.7</td>
</tr>
<tr>
<td>2023</td>
<td>8.6</td>
<td>10.1</td>
</tr>
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NHTSA CAFE History - We’ve Only Just Begun ..... 

- Two key milestones for the future are the 2016 requirement and then the more difficult 2022-2025 requirement

- Congress establishes CAFE 1978-1985
- DOT sets truck standard to max feasible 1979-1996
- DOT relaxes car standard 1986-1989
- DOT sets car standard to 27.5 mpg 1990-2010
- Congress freezes truck standards at 20.7 1997-2001
- Bush Administration sets new truck targets 2005-2007
- EISA changes CAFE to new footprint standard 2008- present
- Obama Administration sets new car & truck standards 2012-2016
- Obama Administration sets new car & truck standards 2017-2025
Full and Mild Hybrids will become a significant compliance strategy for all OEMs beyond 2018.
As a result of legislation, vehicle technology is changing quickly!

- US engines are reducing engine displacement and the number of cylinders, while adding boosting, Start/Stop, direct injection, and hybrid technologies, light weighting, material changes and more…….

- Average engine displacement drops more than -500cc by 2024
- Alternative propulsion technology is increasing from 4% today to 13.5% in 2024
- Plug-in hybrids and pure electric vehicles grows to capture just under 750K units per year in 2024
- Total stop/start market potential of nearly 11M units by 2024
- 3 cylinder engines re-enter the market and grow to 1.5M or 10% of the market by 2024
- 4 cylinder engines grow to 10M units per year or 60% of the market by 2024

…..other initiatives will be required!
Material Forecast Analysis
Total NA LV Industry Material Consumption by Pounds

Total BIW declines despite growth in CUVs and rising NA output
Automated Driving Expectations

LEVEL OF AUTOMATION  

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<tr>
<td>L5</td>
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**L2**
- Wide variety of systems bordering L2
- Many incremental and evolutionary steps within Level 2

**L3**
- "Autonomous by 2020" announcements

**L4**
- Limited drive via remote driver control
- Details or timeline unclear

**L5**
- IHS Level 4: Fully autonomous with driver controls
- IHS Level 5: Fully autonomous without driver controls
- "Autonomous by 2020" announcements
A Looming Cost Cliff Alters The Market
OEMs, Suppliers, Regulators and Customers Are All Impacted

Success in a Rising Cost Environment

- Understand your costs, markets & risk profile
- Diversify customers, segments and cadence
- Hedge technologies
- Smart vertical integration
- Proactive engagement
- Today’s differentiators are not tomorrow’s

Today

- ADAS & Connectivity Content Rises, Warranty Costs
- Down Displacement, Multi-speed Trans & S/S
- BIW & Chassis System Lightweighting Begins

~2020

- L3 Autonomy, More ADAS Content, Warranty Visibility
- Mild Hybrid Rise Starts in Larger Segments, 48V
- Mass Reduction Shifts Beyond The ‘Edge Segments’

~2025

- L3/4 Autonomy, Global influences, System Profit Pools Shift
- Full Hybrid, BEV and Alternative Drive Formats Rise
- Integration of ‘Non-Standard Materials’ & Joining Methods
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Summary

At A Plateau ....

• Volumes plateauing in several markets and segments
  > China and SE Asia = 70% CTG - Japan/Korea, North America and Europe grow below global trend

• Risk is rising – Planning is critical – Understand your markets
  > Risk abatement/mitigation, Plausible scenarios and Competitive actions
  > Visioning: What is your market in 5 years, 10 years?

• Changes in mix alter the landscape
  > OEMs feeling the pressure of increased incentives – enhanced productivity requests
  > Existing suppliers begin to cannibalize as new suppliers enter the market

• The New Differentiators
  > Ability to anticipate and benefit from major shifts – electrification, automated driving, lightweighting, logistics, packaging efficiency, performance and the hard/soft part shift
Thank You

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