Trends Affecting the Canadian Auto Industry

Presented by:

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Principal

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Canadian Vehicle Assemblies

Thousands


Chrysler  Ford  GM  Transplant
Canada-Built Engines and Transmissions

Ford: Large V8s
GM: 3.6 V6, A6 and A9, some from Warren, MI
Toyota: 1.8 I4 for Corolla
# Canadian-Built Vehicles

<table>
<thead>
<tr>
<th>Vehicle model assembled in Canada</th>
<th>Location of assembly plant in Canada</th>
<th>Assembled only in Canada?</th>
<th>Vehicle type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chrysler 300</td>
<td>Brampton</td>
<td>Yes</td>
<td>Luxury car</td>
</tr>
<tr>
<td>Dodge Challenger</td>
<td>Brampton</td>
<td>Yes</td>
<td>Muscle car</td>
</tr>
<tr>
<td>Dodge Charger</td>
<td>Brampton</td>
<td>Yes</td>
<td>Muscle car</td>
</tr>
<tr>
<td>Chrysler Pacifica</td>
<td>Windsor</td>
<td>Yes</td>
<td>Minivan</td>
</tr>
<tr>
<td>Ford Edge</td>
<td>Oakville</td>
<td>Yes</td>
<td>Crossover</td>
</tr>
<tr>
<td>Lincoln Nautilus</td>
<td>Oakville</td>
<td>Yes</td>
<td>Crossover</td>
</tr>
<tr>
<td>Chevrolet Equinox</td>
<td>Ingersoll</td>
<td>No</td>
<td>Crossover</td>
</tr>
<tr>
<td>Toyota Corolla</td>
<td>Cambridge</td>
<td>No</td>
<td>Small car</td>
</tr>
<tr>
<td>Honda Civic</td>
<td>Alliston</td>
<td>No</td>
<td>Small car</td>
</tr>
<tr>
<td>Honda CR-V</td>
<td>Alliston</td>
<td>No</td>
<td>Crossover</td>
</tr>
<tr>
<td>Toyota RAV 4</td>
<td>Woodstock</td>
<td>No</td>
<td>Crossover</td>
</tr>
<tr>
<td>Lexus RX350</td>
<td>Cambridge</td>
<td>Yes</td>
<td>Crossover</td>
</tr>
</tbody>
</table>
Volume and Fuel Economy of Canada-Built Vehicles

GM, Ford, FCA: 686,000 vehicles produced in Canada and sold in the U.S.

Units sold in the U.S.

Estimated miles per gallon*

Toyota, Honda, Lexus: 1,129,000 vehicles produced in Canada and sold in the U.S.

* STICKER fuel economy values taken from www.fueleconomy.gov
US-Mexico-Canada Trade (Agreement?)

- The US, Canada, and Mexico have just negotiated the end of steel and aluminum tariffs, setting the stage for ratification of the USMCA.

- The USMCA (or NAFTA 1.1, per Dustin Walsh of *Crain’s Detroit Business*) looks to have modest impacts on the auto industry. Many automakers do not seem happy with the agreement, but are publicly supporting it based on the view that any agreement is better than none. However, the USMCA will have significant compliance costs (true for larger suppliers as well, although “roll-up” provisions overstate domestic content and reduce complexity). Even those makers with high US content will be subject to penalties on some vehicles. The agreement is based on individual vehicles rather than on a company fleet average, and exports are not credited.

- The 2.5% non-compliance tariff is too small to change behavior.

- “Side letters” eliminate much of the incentive to move truck production and some part production from Mexico, and may already be in effect.

- The outlook for ratification is not good; the likely result could be the current NAFTA remains in force unless underlying legislation passed in the 1990s is undone.
Views of Automakers and Suppliers on Fuel Economy

- OEMs clearly want relief and uniformity.
- Views of OEMs on ZEV regulations (even GM) are absolutely clear.
- GM is good cop/bad cop on fuel economy and EVs.
- OEMs are getting more from Trump Administration than they bargained for.
- Oil industry sought and received favor from EPA on the regulation revision.
- Several trade associations are speaking for suppliers, who have been mostly silent as individual companies.
Passenger car miles per gallon, normalized to CAFE

* Note that Japan has already met its 2020 statutory target as of 2013

Details at www.theicct.org/chart-library-passenger-vehicle-fuel-economy

Updated April 2018
Vehicle Types

- Micro and Mild Hybrids Including 48V
- Regular Hybrids
- Plug In Hybrids
- Full Electrics
- Fuel Cells

“Electrified” vs. “Electric” is not understood by many
Forecast is conservative based on products where vehicle characteristics are confirmed.

Source: Baum and Associates US Electric Vehicle Forecast
## Automaker EV Strategies

<table>
<thead>
<tr>
<th>Technology Type</th>
<th>Ford</th>
<th>FCA</th>
<th>GM</th>
<th>NISSAN</th>
<th>FCA</th>
<th>mahza</th>
<th>BMW</th>
<th>Volkswagen</th>
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</thead>
<tbody>
<tr>
<td>Micro Hybrids</td>
<td>Toyota</td>
<td>Ford</td>
<td>Hyundai</td>
<td>Honda</td>
<td>Subaru</td>
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<tr>
<td>Regular Hybrids</td>
<td>Volkswagen</td>
<td>Toyota</td>
<td>Via</td>
<td>BMW</td>
<td>FCA</td>
<td>Fiat Chrysler Automobiles</td>
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<tr>
<td>Plug In Hybrids</td>
<td>Tesla</td>
<td>Nissan</td>
<td>GM</td>
<td>BMW</td>
<td>Ford</td>
<td>Toyota</td>
<td>Hyundai</td>
<td></td>
</tr>
<tr>
<td>Battery Electrics</td>
<td>Toyota</td>
<td>Honda</td>
<td>GM</td>
<td>Mercedes</td>
<td>Hyundai</td>
<td>Ford</td>
<td></td>
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<tr>
<td>Fuel Cell Vehicles</td>
<td>Toyota</td>
<td>Honda</td>
<td>GM</td>
<td>Mercedes</td>
<td>Hyundai</td>
<td>Ford</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Baum and Associates Electric Vehicle Forecast
STATE OF THE ART BATTERY ARCHITECTURE

BOLT BATTERY  ALL NEW BATTERY SYSTEM  SIGNIFICANT IMPROVEMENTS

Cell Cost $145/kWhr  Cell Cost $<100/kWhr

>30% cost reduction  Larger footprint, lower height

Higher energy density  Flexible, modular design

Improved DC Fast Charge

ALL NEW BATTERY PLATFORM PROVIDES FLEXIBLE PACK CONFIGURATIONS AT LOWER COST
GM says it will introduce 20 battery electrics by 2023, with many of these vehicles aimed at China where regulations are driving automaker intentions. Marry Barra says GM will sell 1 million EVs globally by 2026.

Ford has committed to 16 BEVs in five years.

Investment in plug-ins and BEVs over the next several years is expected to be at least $90 billion, with German automakers leading the way at $52 billion, with $19 billion for the Detroit Three.

Daimler, like many automakers, is making bold statements about electrification. It wants all of its vehicles to have electric motors by 2022.

BMW seeks to bring out twelve BEVs by 2025.

VW is spending $7 billion on MEB platform for electric vehicles, which is a derivative of its MQB architecture.

VW to spend $800 million to build EV plant next to Chattanooga plant for 2022.
Japanese OEM Plans

• Honda recommitting to electrification, particularly for its smaller vehicles.

• Toyota is the technology leader in hybrids and is now expanding its commitment to electric vehicles, given issues with fuel cells.

• Toyota is interested in solid state batteries with longer range and no liquid cooling.

• Its TNGA platform is designed to accommodate electric vehicles.

• Nissan got in early and is moving forward.
Uncertainty Ahead

• Regulatory uncertainty in US and Canada (?)
• Fuel prices low ... for how long?
• ICE remains dominant, but at what costs?
• Electrification is broadly defined
• Battery development (including 48V) and charging technology improving
• Will BEVs find their market?
• Product, product, product is coming, but will it sell?
• OEMs and dealers need to market products appropriately.
Thanks, Dan!

Dan Luria