Inside China: Understanding China’s Current and Future Automotive Industry

UMTRI Automotive Futures Group
“Focus on the Future”
UM Automotive Research Conferences

WELCOME!

Bruce M. Belzowskki
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Transportation Research Institute
Managing Director-Automotive Futures
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Automotive Futures
Affiliate Program

Affiliate Members

Argonne National Labs
BorgWarner Inc.
Bosch Corporation
Delphi Corporation
Denso Corporation
FCA LLC
Ford Motor Company
Valeo Corporation
Automotive Futures
Research Partners

**IT Organizations**
- HP
- IBM
- Oracle Corporation
- Siemens-PLM

**OEMs**
- FCA LLC
- Ford Motor Company
- General Motors
- Nissan Tech Center
- Toyota Tech Center

**Government/NGOs**
- Argonne National Labs
- CALSTART
- CARB
- Energy Foundation
- Federal Motor Carrier
- The Hewlett Foundation
- ICCT
- NRDC
- Michigan DOT
- NREL
- NSF

**Government/NGOs**
- Union of Concerned Scientists
- US Army-TARDEC
- US DOT
- US EPA
- US DOE
Automotive Futures
Research Partners

**Suppliers**
- BASF
- BorgWarner
- Bosch
- Chevron
- Continental
- Denso
- Dana
- Delphi
- Dow
- Eaton
- JATCO

**Suppliers**
- JCI
- Lear
- Magna
- Means
- Michelin
- Peterson Spring
- TRW
- Yazaki
- Visteon
- Valeo

**Consultants**
- AT Kearney
- AVL
- FEV
- McKinsey
- Ricardo
- Roland Berger
Automotive Futures
Current Research Programs

• Powertrains
  • 2016-2017 Powertrain Strategies for the 21st Century Survey
    (A collaboration with SAE)
  • Survey results have been distributed to Affiliates

• Total Cost of Ownership: Comparing Diesel and Gas Vehicles (Bosch)
  • Based on resale value of 30K vehicles sold through Mannheim auctions in 2012 / 2013
  • Report available
Automotive Futures
Current Research Programs

• **ITS**
  • The Future of Automotive Safety Sensors (Sponsor: NHTSA)
    • In Progress
  • Comprehensive V2X Retrofit Study of Heavy Trucks (Sponsor: NHTSA)
    • In Progress

• Integrated Mobile Observations: Micro-level weather reporting using cell phones in MDOT vehicles (Sponsor: MDOT and FHWA)
  • Report available.
Automotive Futures
Current Research Programs

• ITS
  • Stuck in Traffic: Analyzing Real Time Traffic Capabilities of Personal Navigation Devices and Traffic Phone Applications
    • Final report available
  • Roadway Evaluation Project: Measuring road roughness via accelerometers in cell phones mounted in MDOT vehicles
    • Final report available
Automotive Futures
Current Research Programs

• ITS

• Deploying Safety Technologies in Commercial Vehicles
  • Familiarity and penetration currently and in the future of: Forward Collision Warning / Lane Departure Warning / Blind Spot Detection / ESC / Vehicle Communications
  • Final report available (Sponsor: ITS America)
Automotive Futures
Researchers

• Student Researchers:
  • **Alexa Kershenheiter**: Senior, Mechanical Engineering
    • Working on study of the effects of autonomous vehicles on society, the economy, and the individual study
  • **Camille Cu**, Senior, Economics
    • Chinese electric vehicle industry: subsidies
  • **Aaron Dalal**, Sophomore, Business
    • UM Automotive Industry Student Survey
  • **Michael Ross**, Sophomore, Aerospace Engineering
    • UM Powertrain Strategies for the 21st Century Survey
  • **Brian Roche**, Freshman, Political Science
    • UMTRI Automotive Futures Focus on the Future Conferences
Upcoming UMTRI-AF Conferences

February 14, 2018: Marketing New Powertrain Technologies. This conference will review what manufacturers have done to promote new powertrain technologies over the past 10 years, and also look at what will be the future trends for marketing these technologies over the next decade.

April 18, 2018: New Mobility Conference. Our 4th annual New Mobility conference will investigate mobility as a service transportation business models that support sustainability as well as transport.

July 18, 2018: Powertrain Strategies for the 21st Century: Our 10th annual conference that focuses on major issues related to the future powertrains. This conference is also the place to see the results of our annual Powertrain Strategies for the 21st Century expert survey that estimates powertrain technology penetration for 2020 and 2025.
9am  

**Bruce Belzowsky**, Managing Director, Automotive Futures, UM Transportation Research Institute

- **Ken DeWoskin**, Senior Advisor, Chinese Services Group, Deloitte Consulting
  - Ken DeWoskin Q&A
- **Jun Ma**, Vice Dean for the Automotive College at Tongji University
  - Jun Ma Q&A

Break (20 minutes)  
Changan CS55 on display outside
Conference Presenters/Schedule

- **Bruce Belzowski**, Managing Director, UMTRI Automotive Futures
- **Michael Andrews**, HMI Team Lead, Intelligent and Connected Vehicle Group, Changan US R&D Center
- **Bruce Belzowski**, Managing Director, UMTRI Automotive Futures
- **Harold Sun**, Technical Director, Fitech
- **Conference Q&A**

1:30pm Lunch
2:00pm Adjourn
Post Conference Mailing

Attendees:
- Link to presentations

Affiliates:
- Link to presentations sent to all company representatives in our database
- Document and link to a review of highlights from the conference
Housekeeping

- Restrooms
- Wireless
- Cell Phones: Silent
- Speaker Bios
- Question Cards
Conference Questions

• Which companies are the leaders in sales?
• How are the independent Chinese manufacturers faring?
• What can the multinational auto industry expect from China after the recent National Party Congress?
• Is there any possibility of allowing multinationals to exit their joint venture relationships?
• How is China preparing for autonomous vehicles?
Conference Questions

• What kind of infrastructure projects are focused on autonomous vehicles?
• How have China’s NEV policies changed? How have the changes affected sales?
• How are multinational companies responding to the aggressive goals set for NEVs?
• What are Chinese manufacturers doing to meet the challenges of autonomy?
Conference Questions

• How quickly can China’s manufacturers come to the US with competitive vehicles?
• How have China’s vehicles emissions goals changed?
• How far along are the companies in meeting the China VI emissions goals?
China’s Auto Industry By the Numbers
China Total Sales of New Vehicles

Sources: OICA Sales Statistics and MarkLines Automotive Industry Portal

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales (Units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>9,390,000</td>
</tr>
<tr>
<td>2009</td>
<td>13,640,000</td>
</tr>
<tr>
<td>2010</td>
<td>18,061,936</td>
</tr>
<tr>
<td>2011</td>
<td>18,505,114</td>
</tr>
<tr>
<td>2012</td>
<td>19,306,435</td>
</tr>
<tr>
<td>2013</td>
<td>21,984,079</td>
</tr>
<tr>
<td>2014</td>
<td>23,499,001</td>
</tr>
<tr>
<td>2015</td>
<td>24,597,583</td>
</tr>
<tr>
<td>2016</td>
<td>28,028,175</td>
</tr>
<tr>
<td>2017</td>
<td>20,224,500</td>
</tr>
</tbody>
</table>
Total China Passenger Car and Light Truck Vehicle Production

Sources: 2016 Ward’s Automotive Yearbook and MarkLines Automotive Industry Portal
2016 Top Ten Vehicle Production

Source: 2017 Ward's Automotive Yearbook
2014 through 2016 Comparison of Top Ten Vehicle Production

Source: 2016/2017 Ward’s Automotive Yearbooks
2016 Top Foreign Joint Venture Production

Source: 2017 Ward’s Automotive Yearbook
2014 to 2016 Comparison of Foreign Top Joint Venture Production

Source: 2016/2017 Ward's Automotive Yearbook
2016 Chinese Own Brands Production
(Not including Joint Ventures)

<table>
<thead>
<tr>
<th>Brand</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changan</td>
<td>1,445,395</td>
</tr>
<tr>
<td>Dongfeng</td>
<td>960,561</td>
</tr>
<tr>
<td>Beijing AIC</td>
<td>838,984</td>
</tr>
<tr>
<td>Guangzhou AC</td>
<td>468,464</td>
</tr>
<tr>
<td>FAW</td>
<td>304,766</td>
</tr>
<tr>
<td>Shanghai AIC</td>
<td>207,257</td>
</tr>
</tbody>
</table>

Source: 2017 Ward’s Automotive Yearbook
2016 Top Chinese Independent Manufacturer Production (Non-Joint Venture Companies)

- Great Wall: 1,094,360
- Geely: 811,084
- Chery: 666,215
- Jianghuai: 576,683
- BYD: 497,285
- JMC: 321,488

Source: 2017 Ward’s Automotive Yearbook
2014 to 2016 Comparison of Top Chinese Independent Manufacturer Production (Non-Joint Venture Companies)

Source: 2016/2017 Ward’s Automotive Yearbook
2016 Number of Models by Company
(Chinese Own Brands Not Including Joint Ventures)

Source: ChinaAutoWeb

<table>
<thead>
<tr>
<th>Company</th>
<th>Sedans, Hatchbacks</th>
<th>SUVs, MPVs, Microvans, Pickups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changan</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>Dongfeng</td>
<td>12</td>
<td>29</td>
</tr>
<tr>
<td>Beijing AIC</td>
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<td>23</td>
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<td>FAW</td>
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<td>Guangzhou AC</td>
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<td>Shanghai AIC</td>
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<td>18</td>
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</tbody>
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Source: ChinaAutoWeb
2016 Number of Models by Company (Independent Companies)

Source: ChinaAutoWeb

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<td>Great Wall</td>
<td>8</td>
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<td>Geely</td>
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<td>35</td>
</tr>
<tr>
<td>Jianghuai</td>
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<td>10</td>
</tr>
<tr>
<td>Chery</td>
<td>29</td>
<td>20</td>
</tr>
<tr>
<td>BYD</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>JMC</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Foton</td>
<td>0</td>
<td>11</td>
</tr>
</tbody>
</table>

Source: ChinaAutoWeb
2016 Production By Company
(Chinese Own Brands Not Including Joint Ventures)

Source: 2017 Ward’s Automotive Yearbook
2016 Production By Company (Independent Companies)

Source: 2017 Ward's Automotive Yearbook
Traditional sources of information about cars have become less popular, and more consumers are using digital media.

Consumers who use channel to obtain information when buying a car (%)

- Newspapers and magazines: 61% (2011), 15% (2016)
- Family, friends, and colleagues: 65% (2011), 54% (2016)
- Professionally-run websites and discussion forums: 42% (2011), 58% (2016)
- Social networks and online communities: 7% (2011), 22% (2016)
- Automakers' official websites: 25% (2011), 33% (2016)
- Online advertisements: 13% (2011), 21% (2016)

Consumers increasingly see used cars as a good alternative to new cars

Exhibit 4

Consumers' approach to used cars during last car purchase:
- 2011: 18%
- 2016: 47%

Consumers' reasons for considering used cars:
- To get a lower price on a given car: 39% (2011), 56% (2016)
- To get a better car for the same price: 12% (2011), 37% (2016)
- As a temporary solution: 59% (2011), 28% (2016)

Consumers' reasons for not considering used cars:
- Unsure that documents are valid: 56% (2011), 46% (2016)
- Unsure about previous owner's trustworthiness: 24% (2011), 24% (2016)

1 For 2011, n = 2,035; for 2016, n = 3,071.
2 For 2011, n = 366; for 2016, n = 1,071.

Consumer Preferences in China: Ownership Trends

Exhibit 2

Owning a car is not seen as important as in the past, and consumers are open to renting, leasing, or co-owning cars instead of buying them.

Consumers' opinions on owning cars (n = 3,571, %)
- 60% in contrast to before, owning a car is no longer a status symbol
- 42% owning a car is less appealing due to high car maintenance costs and worsening traffic congestion
- 37% nowadays with more means of transport available, it does not seem as important to own a car

Consumers' opinions on alternatives to owning cars (n = 3,571, %)
- 40% I can live without a car and I can rent when I need a car
- 34% If the cost of long-term leasing is roughly the same as buying a car, I would prefer leasing
- 26% I do not mind co-owning and sharing a car with others

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The Link to Presentations Will Be Emailed This Weekend