Industry Performance Update and NAP 2014: Towards a Sustainable Automotive Industry

Purpose: Information
Submitted by: Malaysia
INDUSTRY PERFORMANCE UPDATE
MALAYSIA: TIV 2010 TO 2015

MALAYSIA: TIV BY TYPES OF VEHICLE (2010-2015)
### MALAYSIA: TIV BY TYPES OF VEHICLE

<table>
<thead>
<tr>
<th>SEGMENT</th>
<th>YEAR-TO-DATE APRIL</th>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2016</td>
<td>2015</td>
<td>Variance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>units</td>
<td></td>
<td></td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Total Industry Volume (TIV)</td>
<td>173,432</td>
<td>213,566</td>
<td>(40,134)</td>
<td>(18.8)</td>
<td></td>
</tr>
<tr>
<td>Passenger Vehicles:</td>
<td>155,254</td>
<td>190,040</td>
<td>(34,786)</td>
<td>(18.3)</td>
<td></td>
</tr>
<tr>
<td>PC (Passenger Cars)</td>
<td>117,499</td>
<td>149,382</td>
<td>(31,883)</td>
<td>(21.3)</td>
<td></td>
</tr>
<tr>
<td>WV (Window Vans)</td>
<td>1,453</td>
<td>1,510</td>
<td>(57)</td>
<td>(3.8)</td>
<td></td>
</tr>
<tr>
<td>MPV (Multi-Purpose Vehicles)</td>
<td>15,818</td>
<td>22,786</td>
<td>(6,968)</td>
<td>(30.6)</td>
<td></td>
</tr>
<tr>
<td>4x4/SUV (Four Wheel Drive / Sports Utility Vehicles)</td>
<td>20,484</td>
<td>16,362</td>
<td>4,122</td>
<td>25.2</td>
<td></td>
</tr>
<tr>
<td>Commercial Vehicles:</td>
<td>18,178</td>
<td>23,526</td>
<td>(5,348)</td>
<td>(22.7)</td>
<td></td>
</tr>
<tr>
<td>PV (Panel Vans)</td>
<td>612</td>
<td>1,063</td>
<td>(451)</td>
<td>(42.4)</td>
<td></td>
</tr>
<tr>
<td>PU (Pick Ups)</td>
<td>12,310</td>
<td>16,548</td>
<td>(4,238)</td>
<td>(25.6)</td>
<td></td>
</tr>
<tr>
<td>Trucks</td>
<td>4,647</td>
<td>5,014</td>
<td>(367)</td>
<td>(7.3)</td>
<td></td>
</tr>
<tr>
<td>PM (Prime Movers)</td>
<td>375</td>
<td>564</td>
<td>(189)</td>
<td>(33.5)</td>
<td></td>
</tr>
<tr>
<td>Bus</td>
<td>234</td>
<td>337</td>
<td>(103)</td>
<td>(30.6)</td>
<td></td>
</tr>
</tbody>
</table>

### MALAYSIA: TPV BY TYPES OF VEHICLE

<table>
<thead>
<tr>
<th>SEGMENT</th>
<th>YEAR-TO-DATE APRIL</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2016</td>
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<td>Variance</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>units</td>
<td></td>
<td></td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Total Industry Production (TIP)</td>
<td>174,385</td>
<td>225,331</td>
<td>(50,946)</td>
<td>(22.6)</td>
<td></td>
</tr>
<tr>
<td>Passenger Vehicles:</td>
<td>163,055</td>
<td>208,338</td>
<td>(45,283)</td>
<td>(21.7)</td>
<td></td>
</tr>
<tr>
<td>PC (Passenger Cars)</td>
<td>122,629</td>
<td>164,138</td>
<td>(41,509)</td>
<td>(25.3)</td>
<td></td>
</tr>
<tr>
<td>WV (Window Vans)</td>
<td>2,031</td>
<td>1,758</td>
<td>273</td>
<td>15.5</td>
<td></td>
</tr>
<tr>
<td>MPV (Multi-Purpose Vehicles)</td>
<td>14,628</td>
<td>24,354</td>
<td>(9,726)</td>
<td>(39.9)</td>
<td></td>
</tr>
<tr>
<td>4x4/SUV (Four Wheel Drive / Sports Utility Vehicles)</td>
<td>23,767</td>
<td>18,088</td>
<td>5,679</td>
<td>31.4</td>
<td></td>
</tr>
<tr>
<td>Commercial Vehicles:</td>
<td>11,330</td>
<td>16,993</td>
<td>(5,663)</td>
<td>(33.3)</td>
<td></td>
</tr>
<tr>
<td>PV (Panel Vans)</td>
<td>559</td>
<td>897</td>
<td>(338)</td>
<td>(37.7)</td>
<td></td>
</tr>
<tr>
<td>PU (Pick Ups)</td>
<td>6,238</td>
<td>11,322</td>
<td>(5,084)</td>
<td>(44.9)</td>
<td></td>
</tr>
<tr>
<td>Trucks</td>
<td>4,184</td>
<td>5,014</td>
<td>(830)</td>
<td>(16.6)</td>
<td></td>
</tr>
<tr>
<td>PM (Prime Movers)</td>
<td>187</td>
<td>392</td>
<td>(205)</td>
<td>(52.3)</td>
<td></td>
</tr>
<tr>
<td>Bus</td>
<td>162</td>
<td>152</td>
<td>10</td>
<td>6.6</td>
<td></td>
</tr>
</tbody>
</table>
### MALAYSIA: TIV BY TYPES OF VEHICLE

<table>
<thead>
<tr>
<th></th>
<th>2015 ACTUAL</th>
<th>2016 FORECAST</th>
<th>Projected Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Industry Volume (TIV)</td>
<td>666,674</td>
<td>575,250</td>
<td>(2.7%)</td>
</tr>
<tr>
<td>Passenger Vehicles (PV)</td>
<td>591,298</td>
<td>74,750</td>
<td>(0.8%)</td>
</tr>
<tr>
<td>Commercial Vehicles (CV)</td>
<td>75,376</td>
<td>650,000</td>
<td>(2.5%)</td>
</tr>
</tbody>
</table>

### MALAYSIA: MOTORCYCLE SALES (2010 – 2015)

<table>
<thead>
<tr>
<th>Year</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>468,175</td>
</tr>
<tr>
<td>2011</td>
<td>494,586</td>
</tr>
<tr>
<td>2012</td>
<td>537,753</td>
</tr>
<tr>
<td>2013</td>
<td>546,719</td>
</tr>
<tr>
<td>2014</td>
<td>442,749</td>
</tr>
<tr>
<td>2015</td>
<td>380,802</td>
</tr>
</tbody>
</table>

% growth:
- 2010: 8.2%
- 2011: 5.6%
- 2012: 8.7%
- 2013: 1.7%
- 2014: -19%
- 2015: -14%
THE rapid transformation of automotive mobility — from fossil fuel to hybrid and fully electric vehicles — is attributed to the creativity and innovativeness of the global automotive industrial community.

NAP 2014 vision and strategy is to prepare Malaysian Automotive vendor, businesses and entrepreneurs better for a game changing of automotive global digital technology and equip them with the knowledge and skills needed to compete and thrive.

Understand
- How new information technology developments are transforming the automotive global business landscape
- The new way of doing business in the Digital Age of Experience

Competitive ASEAN Automotive Industry
- Various existing schemes to boost Digital Entrepreneurship, such as public policies, private initiatives and public-private partnerships
- Notably in some developed and emerging economies with very active "digital and entrepreneurial policies" in place

Shape the Malaysian vision and strategy
- Supporting digital entrepreneurship
- Offering Malaysian SMEs new business opportunities and a leading place in the modern digital economy

Organisations within the local automotive industry at all levels, from parts and components manufacturing to aftermarket services, research and development (R&D) and marketing, also need to attain creative and innovative ability within their workforce to remain competitive on the global scene.
DRIVING INNOVATION IN THE AGE OF EXPERIENCE

Background  Focus  Perspective  Concept

The Malaysia Automotive Institute (MAI) is an agency of the Ministry of International Trade and Industry (MITI)

• We are a think tank, tasked with strengthening the Malaysian Automotive Industry

• An Intermediary between stakeholders in Malaysia’s automotive community

• We Formulate policies & perform research on the industry

• We also develop human capital & coordinate between public and private sectors

• Malaysia Government Driving Auto Industry Transformation

EEV PLAN TO DRIVE SECTOR’S COMPETITIVENESS

Background  Focus  Perspective  Concept

EEV is defined as vehicles that meet a set of define specification in terms of carbon emissions level (g/km) and fuel consumption (l/100km). EEV includes fuel efficient vehicles, hybrid, EV and alternatively fuelled vehicles e.g. CNG, LPG, Biodiesel, Ethanol, Hydrogen and Fuel Cell.
EEV PLAN TO DRIVE SECTOR'S COMPETITIVENESS

On the technological development front, EEV will open up a new frontier for local technocrats, academia, R&D organisations and players in the entire supply chain to design and develop products, processes and materials to fulfil the EEV manufacturing requirement.

Understanding how new information technology developments are transforming the Automotive global business landscape and the new way of doing business in the Age of Experience
EXPERIENCE & DIGITAL FORCE

Background | Focus | Perspective | Concept | Mobile

Cloud
- Infrastructure as a service
- Cloud accounting
- Virtualization
- Software as a service
- Hybrid clouds
- ...

Cyber
- Geo-location marketing
- Localization
- Internet of things
- Mobile payment
- Apps
- ...

Analytics

Cloud

Operating model
- Automation of processes
- Use of smart infrastructure
- Integration of physical goods into the digital world through embedded wireless devices
- Internal and external collaboration platforms
- Digital prototyping, testing, production and distribution
- Telecommuting or telework

Business model
- Virtual stores and companies
- Digital goods and services
- Smart cities
- Made-to-order, i.e. custom-made to the exact criteria and specifications of the customer

Customer & Business Insight
- Decisions through deeper analysis of increasing amounts of data
- Social virtualisation
- Digital marketing

TECHNOLOGY COLLABORATION

Background | Focus | Perspective | Concept | Concept | Concept

PROCESS
- Flexible Roll Forming
- Lightweight Glazing
- Composites Manufacturing towards 2030
- Battery Material Development towards 2030
- Mould Making optimisation
- Tool Wear Prediction
- Plastic Injection Optimisation

MATERIAL

MANUFACTURING
- 3DEXPERIENCE – Swy m; CATIA; DELMIA; APRISO
- Manufacturing Operation Management (MOM)
- Manufacturing Execution System (MES)
- 3Rs Recyclability, Reusability, Reusability

SYSTEM

AFTERMARKET
- Workshop Management System
- Total Automotive Parts Solution (TAPS)
- 4R1S

Lithium Ion Battery Manufacturing
- Electric Vehicles (EV)
TECHNOLOGY COLLABORATION

MITS:
MAI INTELLIGENT TECHNOLOGY SYSTEMS

15 Projects ++

<table>
<thead>
<tr>
<th>Code</th>
<th>Research Program</th>
<th>Theme</th>
<th>Project Title</th>
<th>Project Description</th>
<th>Period (months)</th>
<th>Parties Involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-111</td>
<td>1 – Vehicle Electrification</td>
<td>1.1 – Breakthrough Battery</td>
<td>Development of Electrodes and Electrolyte for Lithium Ion Battery</td>
<td>A composite anode material with compatible binder and ionic liquid-based electrolyte</td>
<td>36 MAI</td>
<td>AutoCRC, UoW, UTS</td>
</tr>
<tr>
<td>1-112</td>
<td>1 – Vehicle Electrification</td>
<td>1.1 – Breakthrough Battery</td>
<td>Battery Charge, Mechanical and Thermal Management System Development</td>
<td>A battery charge, mechanical and thermal management system</td>
<td>36 MAI</td>
<td>AutoCRC, UoW, SUT</td>
</tr>
<tr>
<td>1-113</td>
<td>1 – Vehicle Electrification</td>
<td>1.1 – Breakthrough Battery</td>
<td>Lithium Ion Battery Module Packaging and Testing</td>
<td>A battery packaging that reliable for testing</td>
<td>36 MAI</td>
<td>AutoCRC, UoW, SUT</td>
</tr>
</tbody>
</table>
Collaboration Platform for Industry-Academia on the Cloud

- 3DEXPERIENCE for Academia, the most advanced software for product and learning innovation
- MAI Automotive Apps - Bringing Automotive Industry Solution.

Provides a proven environment for deploying academia-industry digital labs involving realistic virtual 3D equipment coupled bi-directionally with real remote devices. By creating an Internet of Things across dispersed pool of experts, real industry development, learners, educators, devices and content, the platform opens new horizons for innovative industry & educational practices.

Achievement as at Dec 2015: Technology Development

- Total of 21 projects, RM120 Million in R&D.
- And 4 projects already commercialized.

### Reduce Cost
- Plastic VMould Design
- Flexible Roll Forming
- 3R System
- Lightweight Plastic Glazing

### Improve Quality
- ATM Diecasting
- Tool Wear Prediction
- Plastic VMould Process

### Enhance Productivity
- Bus Tracking System
- Modular E-Bus Driveline System
- Market Intelligence & Technology Assessment
- Li-Ion Manufacturing Scale Up

### Improve Efficiency
- Advanced Electrode and Electrolytes for Li-Ion Battery
- Battery Management System
- Li-Ion Battery Module Packing
- Automotive Composites

### Better Competitiveness
- Advanced Electrode and Electrolytes for Li-Ion Battery
- Battery Management System
- Li-Ion Battery Module Packing
- Automotive Composites
NAP 2014: Focus towards EEV

EEV

Lower fuel consumption (LFC)

Lower carbon emission (LCE)

ASEAN HUB

RIGHT HAND DRIVE

TECHNOLOGY DEVELOPMENT

Competitive ASEAN Automotive Industry ...

various existing schemes to boost Digital Entrepreneurship, such as public policies, private initiatives and public-private partnerships

MITS:
MAI INTELLIGENT TECHNOLOGY SYSTEMS
ASEAN POPULATION and LABOR FORCE BREAKDOWN

ASEAN is by far the biggest in terms of population against most of its trading partners (Japan and ANZ) and other major economies such as USA, EU and Russia.

Indonesia has the largest labour force of 117 million out of its 238 million population.

Source: IHS, ASEAN Fact Sheet
ASEAN ECONOMIC PARTNERSHIPS

Background Perspective Focus Concept

ASEAN is a strategic economic bloc for the automotive-related investment with growing economic partnerships bilaterally and multilaterally, creating business opportunities for automotive industries in various free trade areas.

ASEAN Economic Community (AEC) 2015

Background Perspective Focus Concept

AEC will further strengthen the automotive markets in ASEAN region and will provide a sustainable business environment in the longer term.

Objectives of AEC

- Complete Elimination of Tariffs Intra-ASEAN
- Mutual Recognition Agreement on Certification
- Harmonization of Automotive Technical Regulations
- Customs Procedures and Distribution Systems Rationalization
- Automotive-Supporting Industries and Human Resources Developments
- Promotion of Safety Precaution and Environmental Protection

Source: MITI

Source: Frost & Sullivan
### Competitive ASEAN Automotive Industry

<table>
<thead>
<tr>
<th>Background</th>
<th>Focus</th>
<th>Perspective</th>
<th>Concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFTA</td>
<td>TPPA</td>
<td>ASEAN</td>
<td>AEC</td>
</tr>
<tr>
<td>Skilled Labor</td>
<td></td>
<td>Economic Integration</td>
<td>Goods</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Services</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Investment</td>
</tr>
</tbody>
</table>

#### Competitive ASEAN Automotive Industry

1. **Economy of Scale**
2. **Higher Quality & Productivity**
3. **Innovation Driven**

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**Malaysian vision & strategy**...to support digital entrepreneurship and to offer Malaysian Automotive Vendors new business opportunities and a leading place in the modern digital economy

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**MITS:**
MAI INTELLIGENT TECHNOLOGY SYSTEMS
Three focus growth areas requiring Human Capital Development Programmes:

1. Future Automotive
   - Manufacturing, Assembly and Services
   - Technology Development
   - Design & Development
   - Testing
   - Production
   - Maintenance & quality
   - PPC & Logistic
   - Distribution & Aftersale
   - Engine Mfg
   - Transmission Mfg
   - Transmission design
   - Telematics
   - Vehicle electronics
   - Lean Technology
   - Connected vehicles
   - Green cars
   - Future Automotive Development

2. 1985 (IMP1) - Assembly Based Industry
   - Areas to be developed through enhancing R&D and Design capability
   - Current areas to be enhanced


NATIONAL AUTOMOTIVE POLICY (NAP) 2014
HUMAN CAPITAL DEVELOPMENT

NATIONAL AUTOMOTIVE POLICY (NAP) 2014
SUPPLY CHAIN DEVELOPMENT

- Lean Production System (LPS)
- Supplier Competitiveness Level (SCL)
- Automotive Supplier Enhancement Programme (ASEP)

Global Automotive Supplier Level

Level 1
- Component supplier / Tier 2
- Engineering services

Level 2
- Component supplier / Tier 2
- Engineering services

Level 3
- Module supplier / Tier 1

Level 4
- Module supplier / Tier 1

Level 5
- Original Design Manufacturer (ODM)

Malaysian Supplier Level

Gap to be improved
Digital technologies create many opportunities for growth and job creation. In some countries, however, doing business is 'easier' than in others.

Source: The World Bank (2012);
Ease of doing business rank 2012

ENERGY EFFICIENT VEHICLE (EEV)

- Low Fuel Consumption
- Low emissions
- High Efficiency

- Mono-Fuel
- Bi-Fuel
- Dual-Fuel
- CNG-DI
- Bio-Diesel B5
- Euro 4
ELECTRIC VEHICLE (EV)

EV Penetration Plan

- Passenger Car
  - EV Rental/Sharing/Leasing
  - EVs with temporary Gov’t Assistance
- Battery Manufacturing
  - Battery Packs for CVs, Power Storage
  - REEV part of solution to extend distance
- CV (Public Transportation)
  - Pilot (City/ Island)
  - Strategic Routing

DRIVING INNOVATION IN THE AGE OF EXPERIENCE

- PROCESS
- MATERIAL
- SYSTEM
- BUSINESS INTELLIGENCE (BI)
- AUTOMOTIVE I-Cloud Initiatives
- MANUFACTURING
- AFTERMARKET

Background  Focus  Perspective  Concept
DRIVING INNOVATION IN THE AGE OF EXPERIENCE

Background  |  Focus  |  Perspective  |  Concept
---|---|---|---

Social Enterprise Platform

MAI PORTAL 3.0

MAI

Automotive Application

MAI APPS

3DEXPERIENCE

- Intelligent information search-based technologies
- Social innovation capabilities
- Realistic 3D virtual experiences

MAI Automotive Apps - Bringing Automotive Industry Solution.

The 3DEXPERIENCE Platform - Harnessing the power of collaborative idea realization - to enable our clients to create delightful EXPERIENCES for their ultimate customers or consumers.

THE 4TH INDUSTRIAL REVOLUTION
- AUTOMOTIVE
CURRENT PROGRAMMES & INITIATIVES

VALIDATION PLAN:
MAI Intelligent Technology solution (MITS) – Smart Manufacturing (Industry 4.0)

2013 - 2014 H1
Objective: Deploy Operations Intelligence for Automotive suppliers in Malaysia for Industry 4.0 with quality improvement and waste reduction

OPERATION INTELLIGENCE (OI)

2014 H2 - 2015
Objective: Enable the adoption of relevant Industry 4.0 solutions to enable OEM and Suppliers in Malaysia to establish sustainable product development practices

3DEXPERIENCE Platform as the collaborative platform for Automotive industry in Malaysia

3D EXPERIENCE PLATFORM

2016 and beyond
Objective: Deploy 3DEXPERIENCE Platform & T&M Solution Experiences for sustainable development of Automotive industry in Malaysia

Objective: Enable Operations Intelligence for Automotive suppliers in Malaysia for Industry 4.0 with quality improvement and waste reduction

Operations Intelligence

T&M Solution Experiences to enable Automotive industry with best practices and guidelines for sustainable product development and manufacturing

Industry Solution Experiences for Transportation & Mobility (T&M)

3DEXPERIENCE PLATFORM

PROPOSED RECOMMENDATION/WAY FORWARD.

Reality of Manufacturing Operations Today

Computerized maintenance management system (CMMS)
Manufacturing Execution System (MES)
Quality Management System (QMS)
Warehouse Management System (WMS)

ERP

M A I N T E N A N C E
P R O D U C T I O N
L A B O R
Q U A L I T Y
I N V E N T O R Y