

# อุตสาหกรรมยานยนต์ไทยพร้อมหรือยัง สำหรับการเปลี่ยนผ่านสู่เทคโนโลยียานยนต์สมัยใหม่



***Presented by Mr. Suphot Sukphisarn***

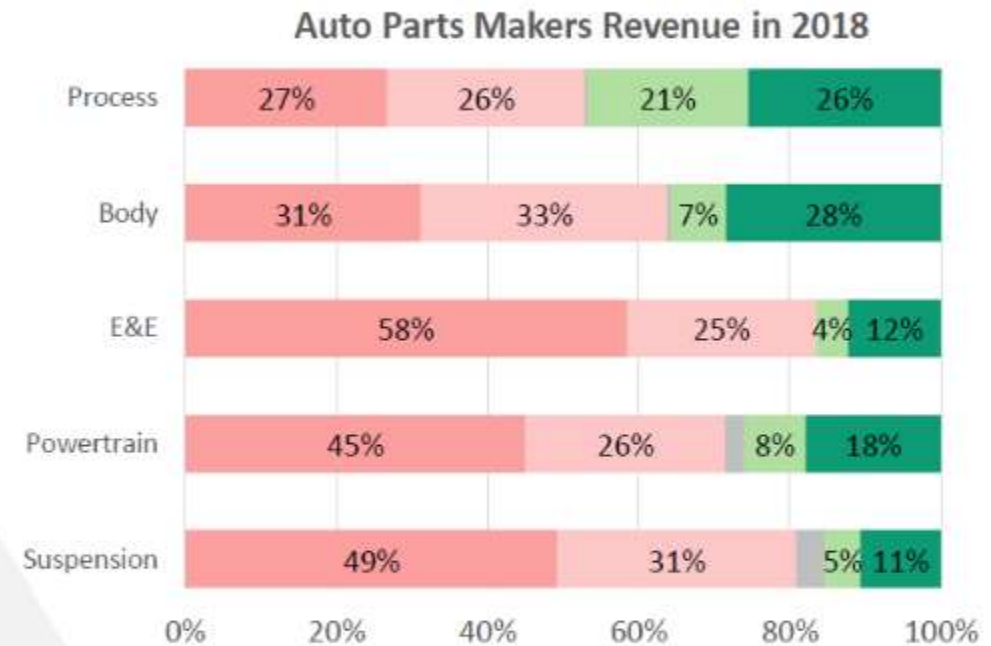
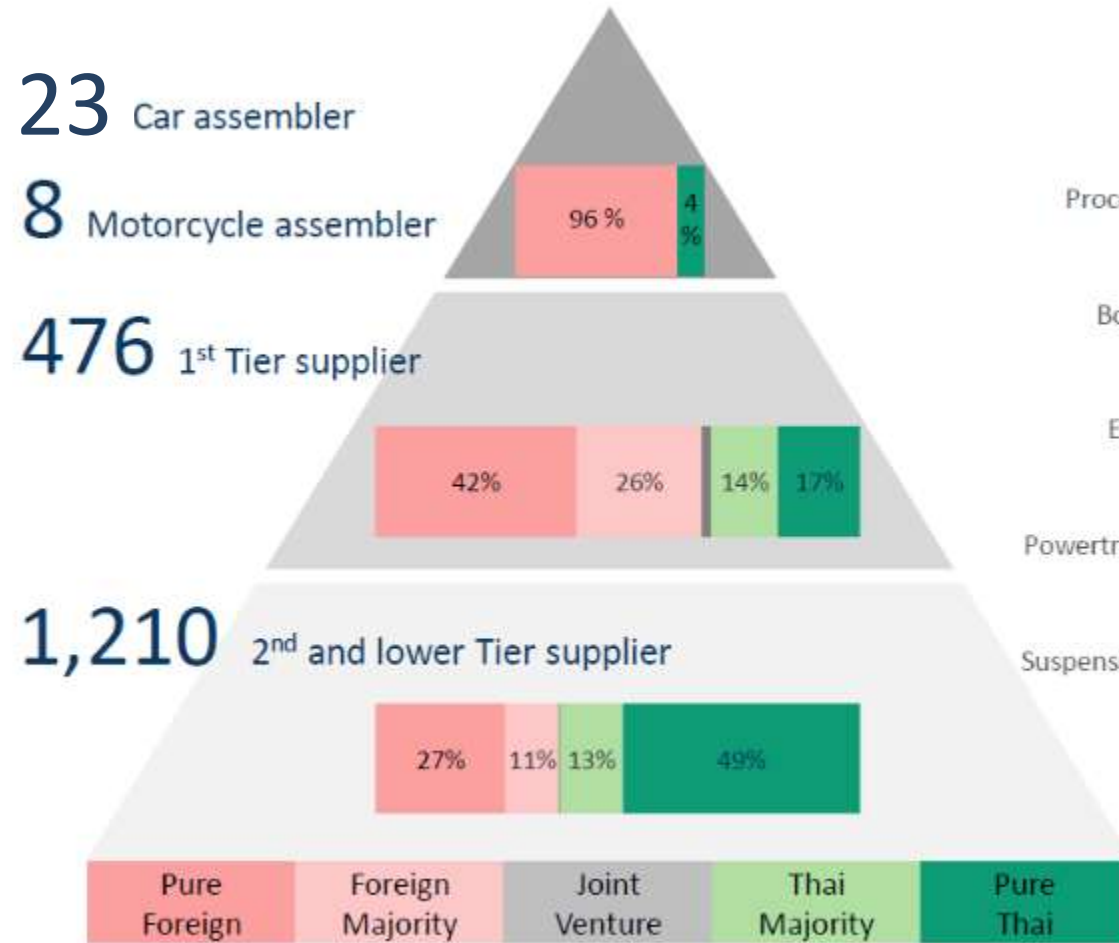
*Chairman of Auto-parts Industry Club (APIC), The Federation of Thai Industry (FTI)  
Deputy Secretary General of Thai Auto Parts Manufacturers Association (TAPMA)*

4 December 2023

Society of Automotive Engineers-Thailand (TSAE)

# Thailand Automotive Industry Structure

## Assemblers, Tier 1 and Tier 2 companies in Thailand



# Thailand Automotive Industry Structure

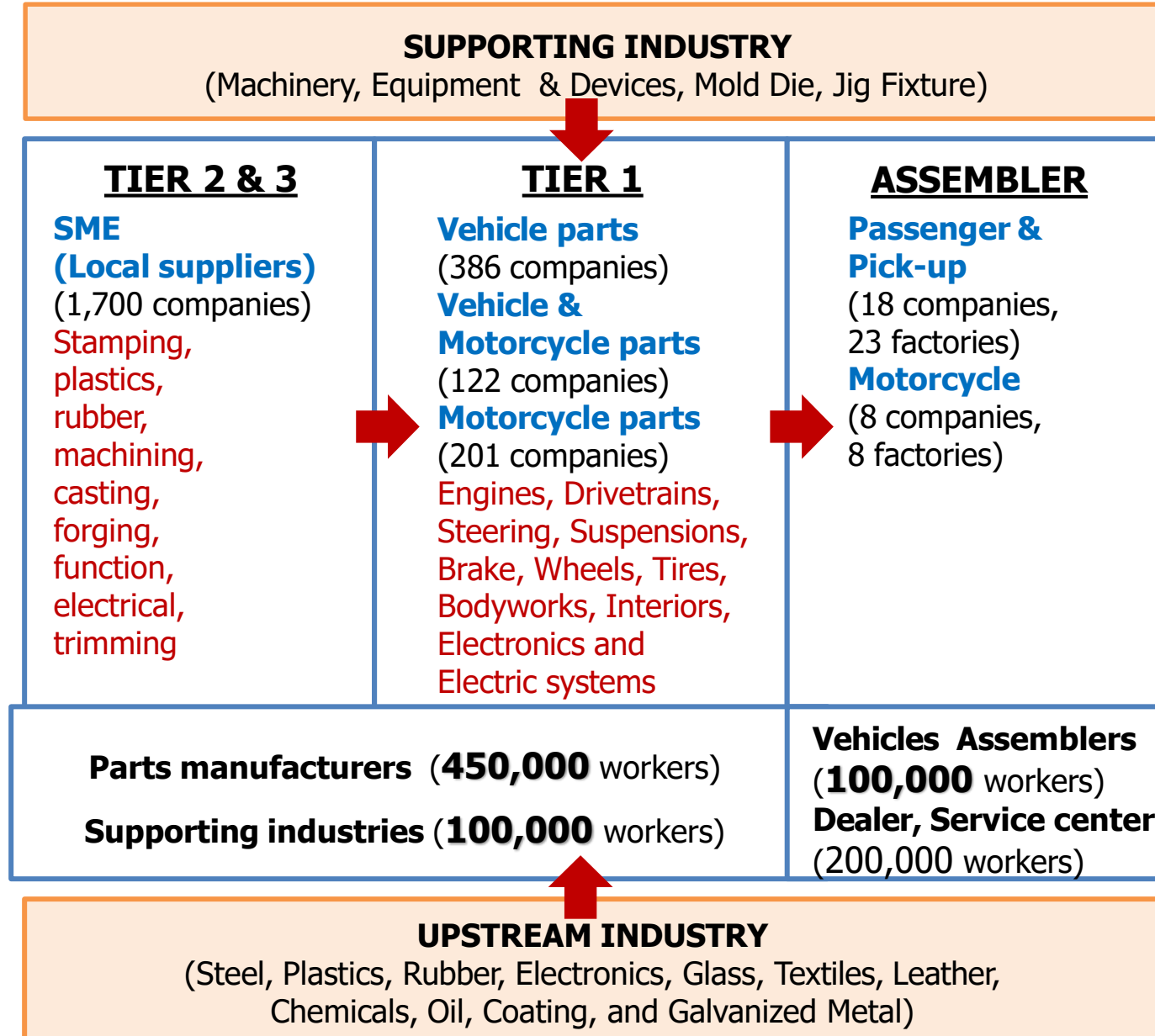
## Strong Cluster & Supply Chain Structure

### SERVICE INDUSTRY

- Distribution
- Finance
- Testing
- Consulting
- Logistics
- Banking/ Leasing

### POLICY & SUPPORTING BODY

- Government
- Associations/ Institutes
- Universities/ Technical Colleges

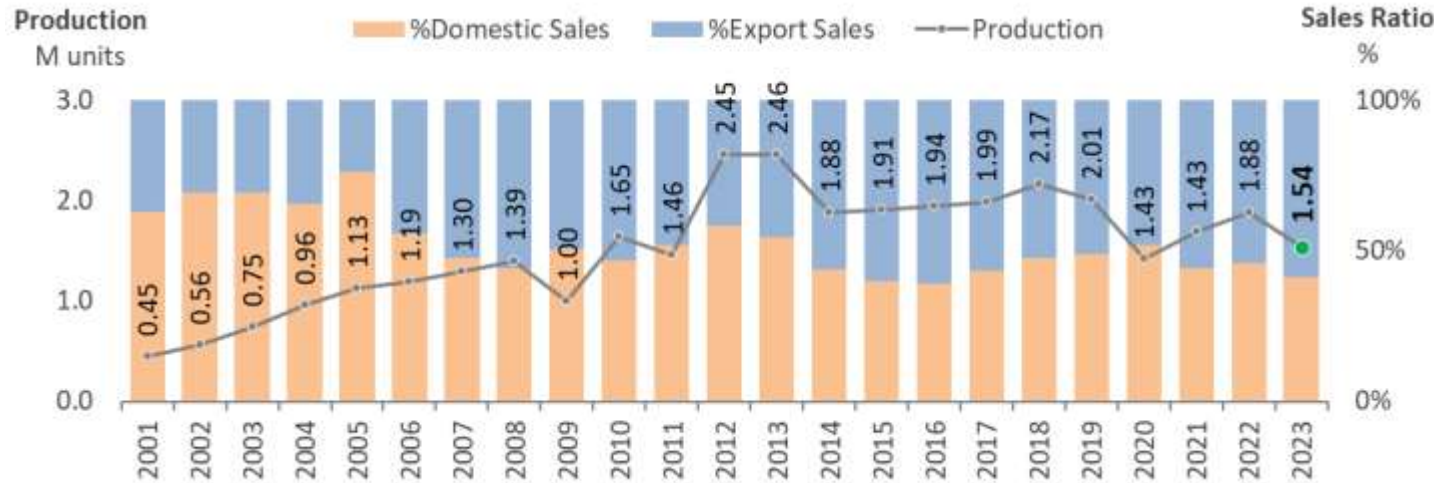
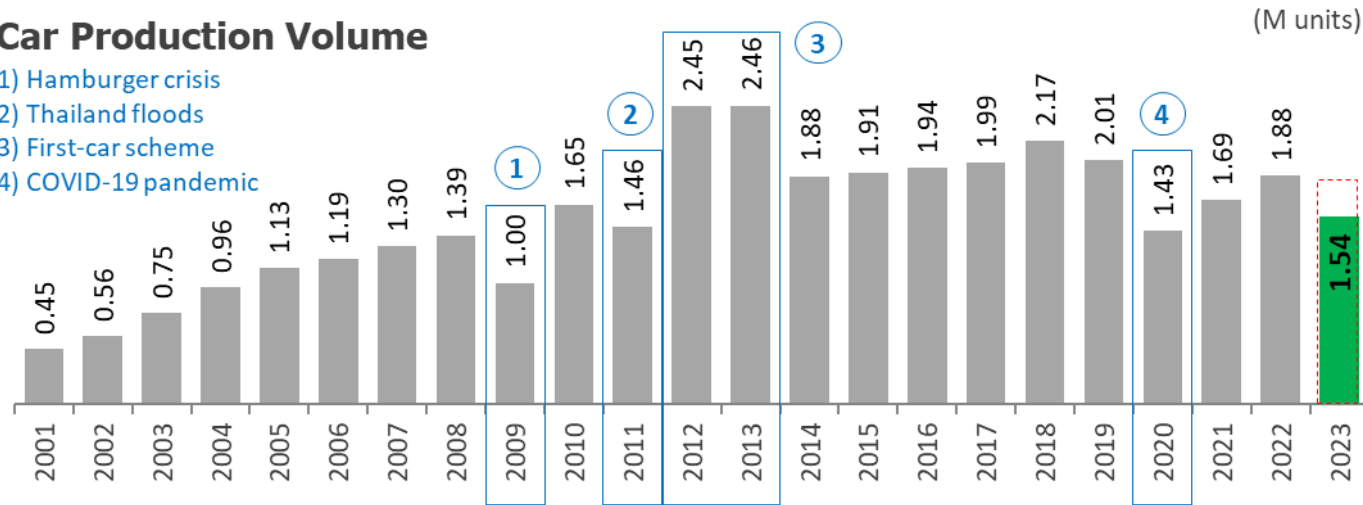


# Thailand Car Performance



## Car Production Volume

- 1) Hamburger crisis
- 2) Thailand floods
- 3) First-car scheme
- 4) COVID-19 pandemic



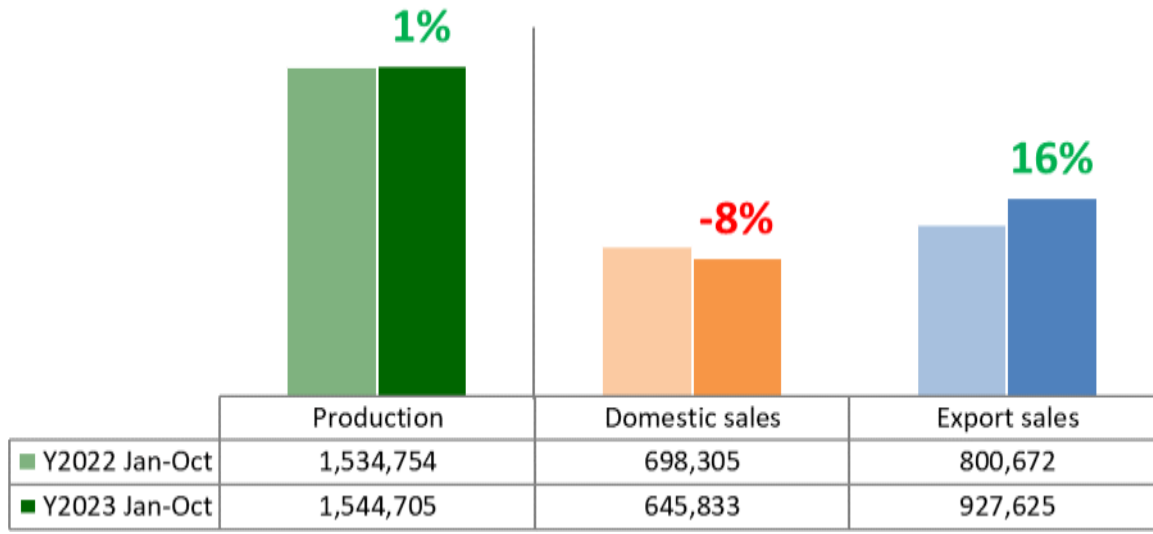
## Forecast Y.2023

October 2023, The Federation of Thai Industries (FTI) adjusted the production target 2023 from 1.90 M units to **1.85 M** units, a decrease of **1.8%** from the previous year. There are 0.8 M units for domestic sales and 1.05 M units for export.

- **Production volume** of January-October 2023 was **1,544,705** units, **83%** as of forecast.

- **Sales volume** of January-October 2023 for domestic sales and exports contributed **645,833** units (**41%**) and **927,625** units (**59%**) respectively.

# Thailand Car Performance



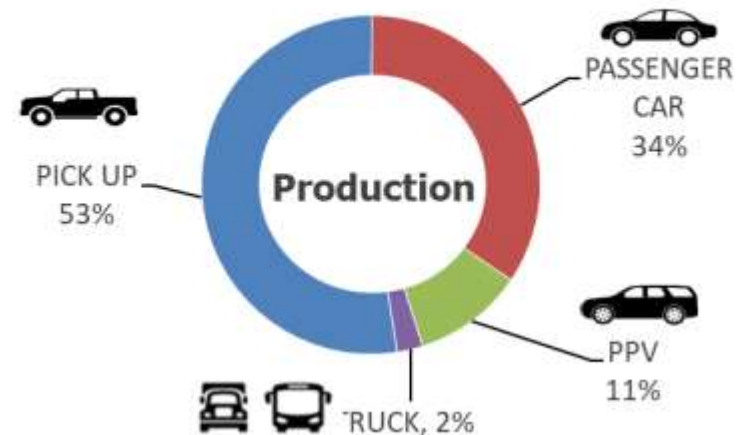
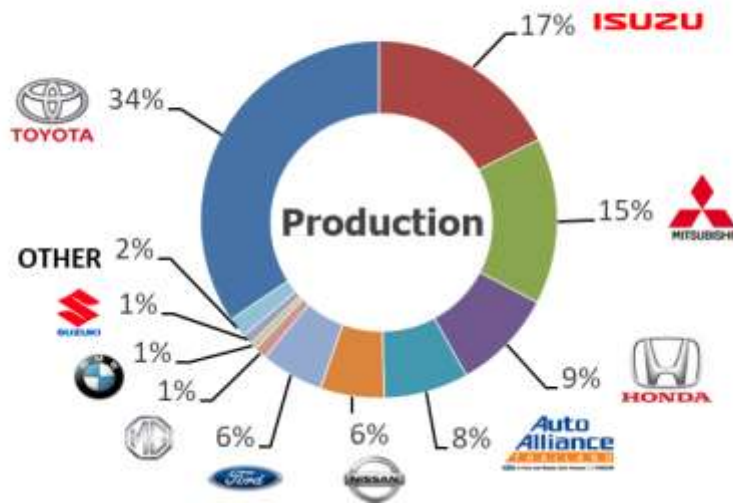
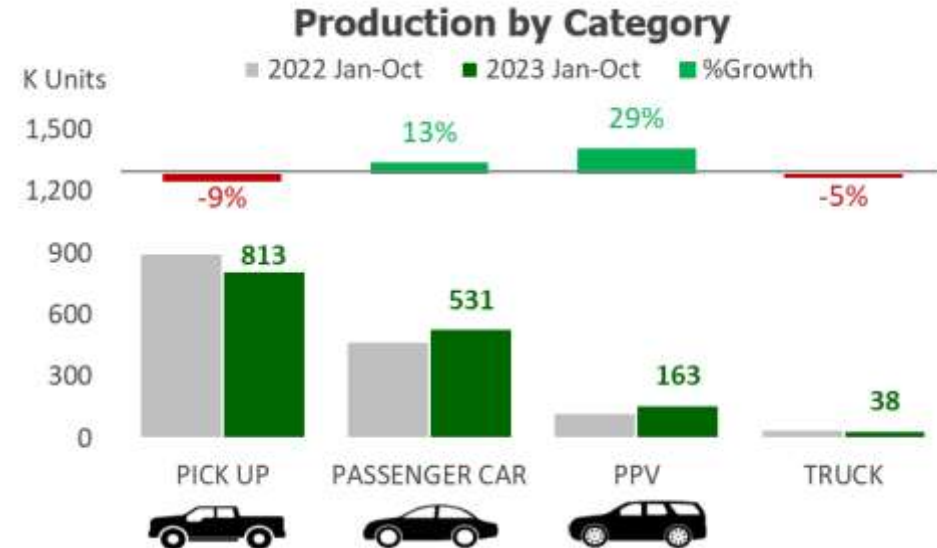
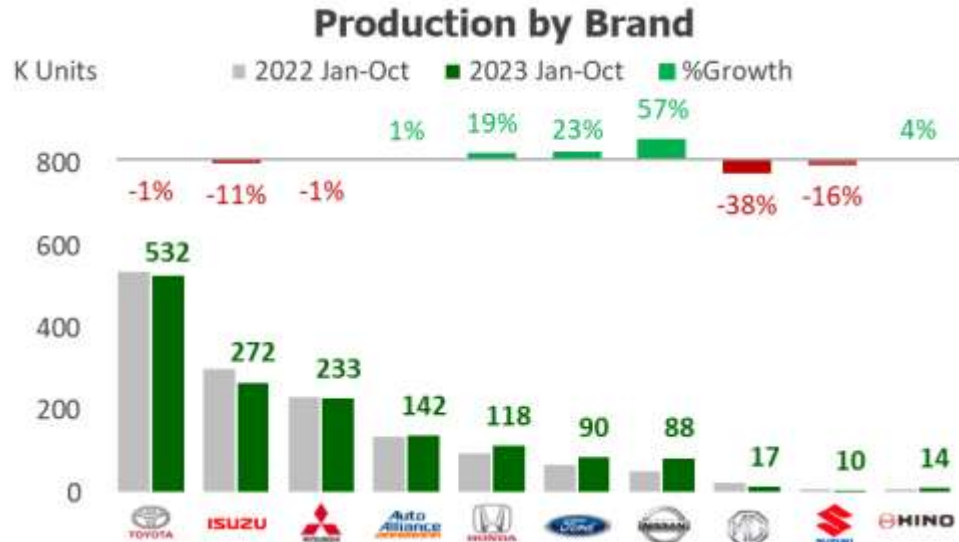
Production volume of January-October 2023 increased by **1%** from the previous year.

Production for export increased because of the low base in 2022 and the intense semiconductor shortage problem was resolved.

Production for domestic sales decreased due to the more strictness in the auto loan approval process of financial institutions, and the increase in the market share of imported electric cars for sale.

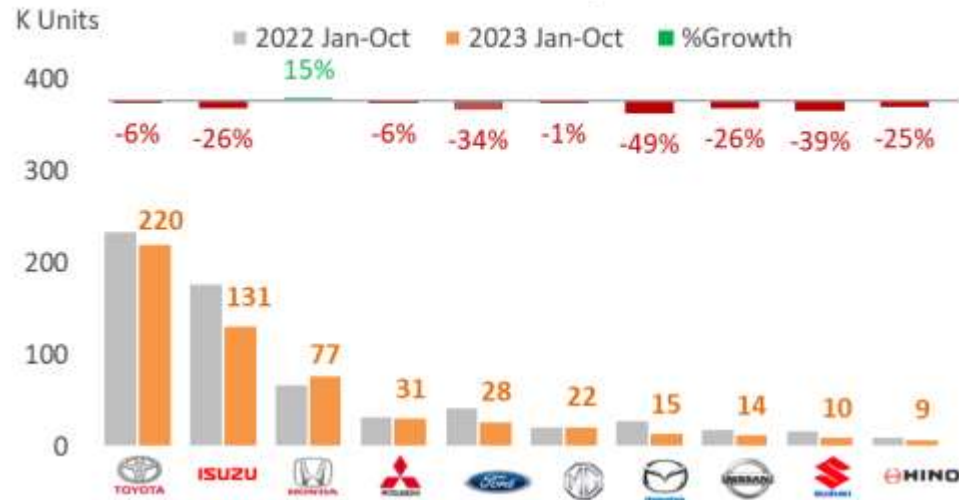


# Thailand Car Performance

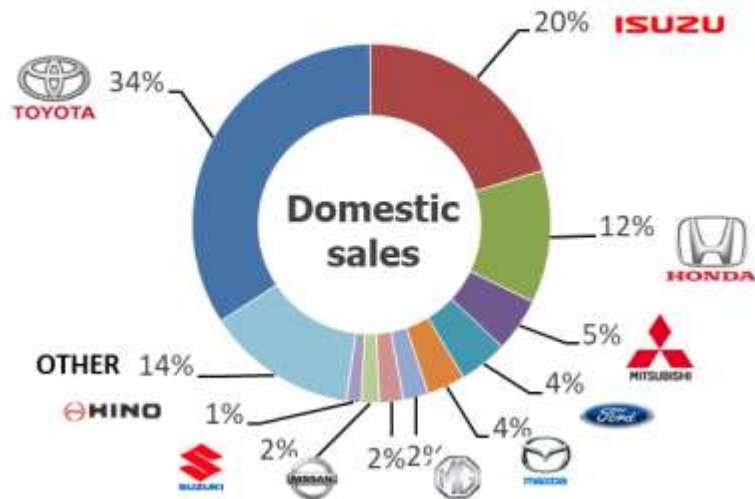
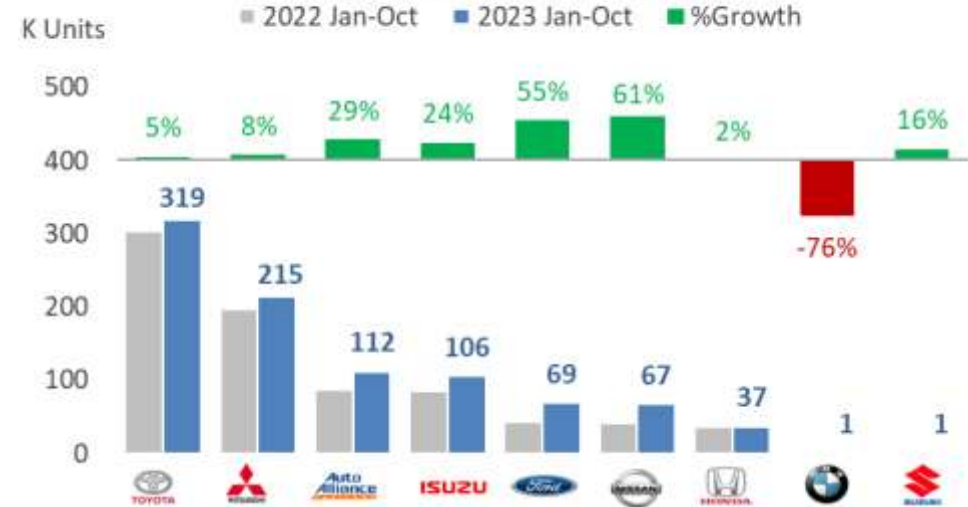


# Thailand Car Performance

## Domestic Sales by Brand



## Export Sales by Brand

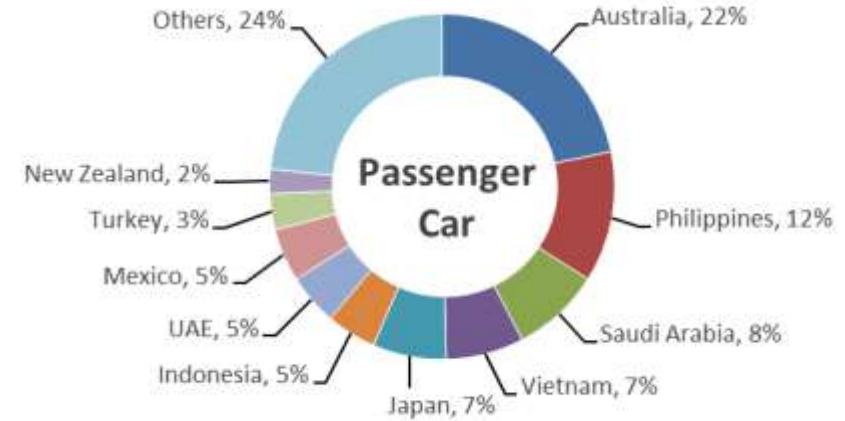


# Thailand Car Performance

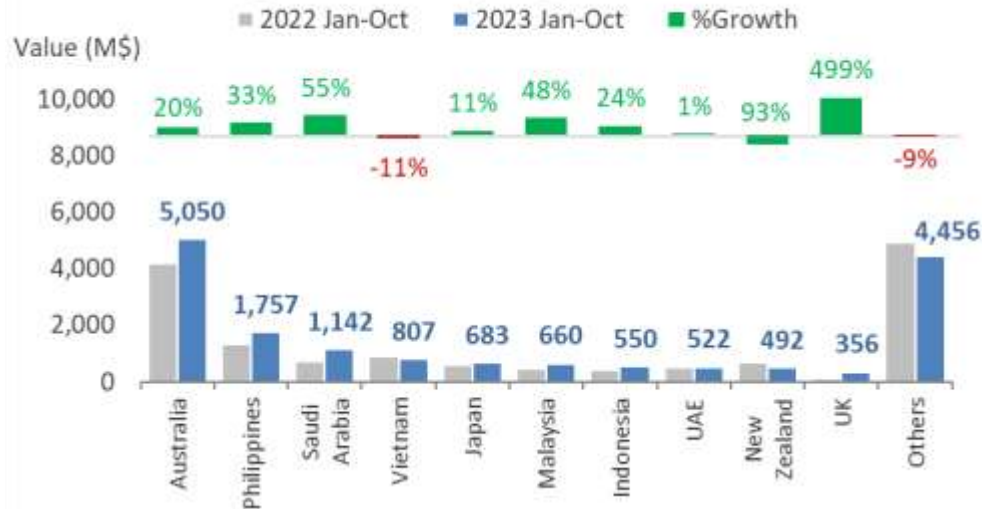
### Export Sales by Region



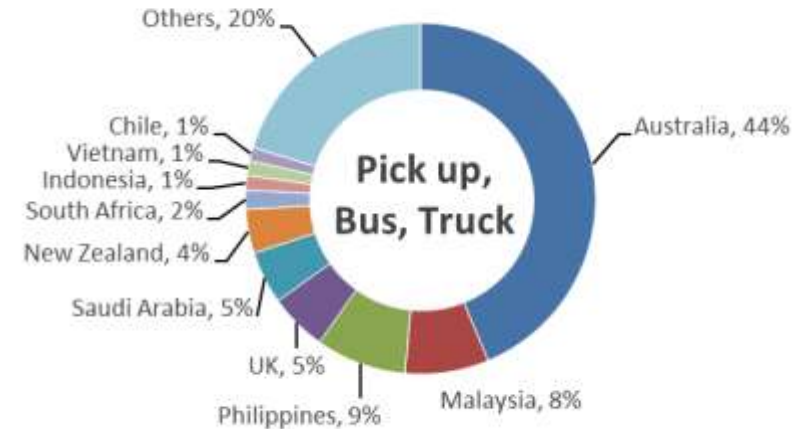
### Export Sales by Top 10 Countries



### Export Sales by Top 10 Countries



### Export Sales by Top 10 Countries





# Thailand Motorcycle Performance

Motorcycle Production Volume



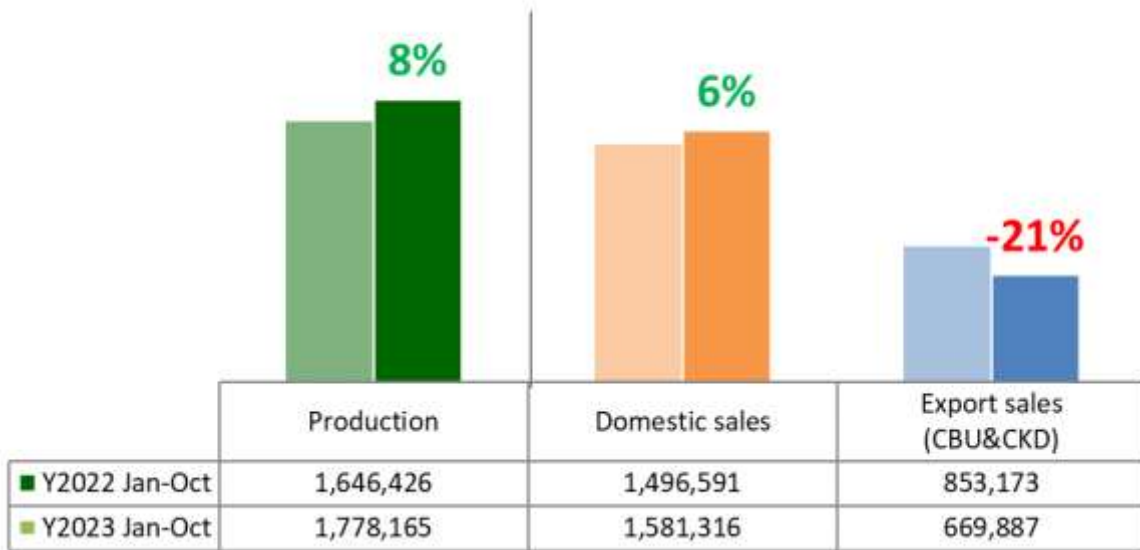
- **Forecast Y.2023**

Production volume are **2.1 M\*** units, an increase of **4.2%** from the previous year. There are 1.75 M units for domestic sales and 0.35 M units for export.

- **Production volume** of January-October 2023 was **1,778,165** units, **85%** as of forecast.

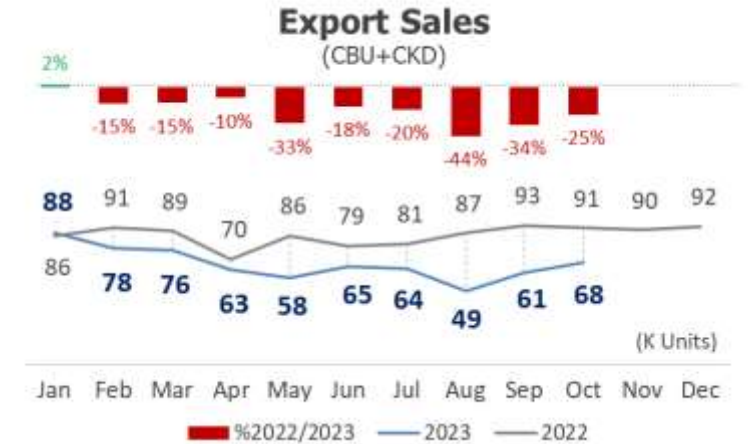
- **Sales volume** of January-October 2023 was divided into **1,581,316\*** units, **70%** for domestic sales and **669,887** units (387,154 units of CBU and 282,733 units of CKD), **30%** for exports.  
\*Volume of CBU only

# Thailand Motorcycle Performance



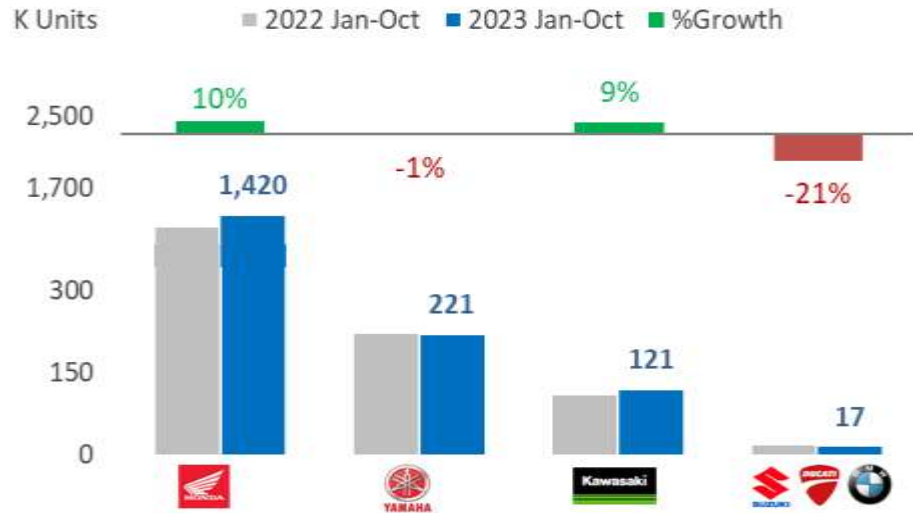
Production volume of January-October 2023 increased by **8%** from the previous year, because production for domestic sales growth, driven by the family/scooter segment, due to the resurging demand for individual mobility and four-wheel vehicles having a high price.

Production for export decreased, especially in CKD, resulted from the construction of new CKD motorcycle factories in countries that previously imported CKD motorbikes from Thailand.

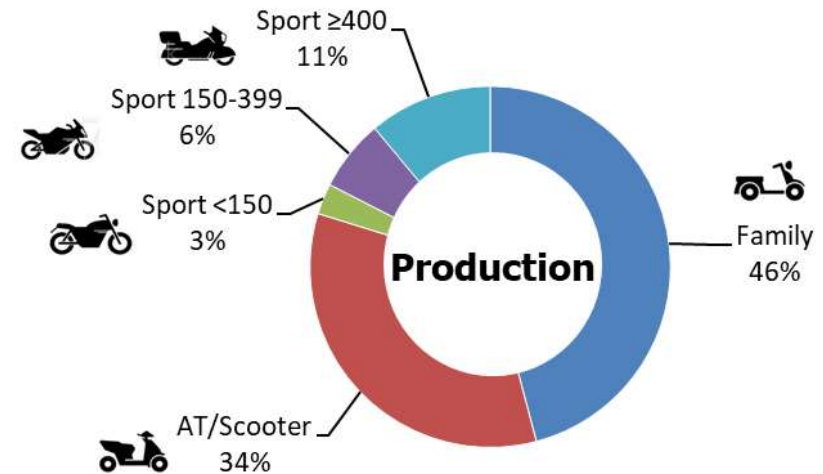
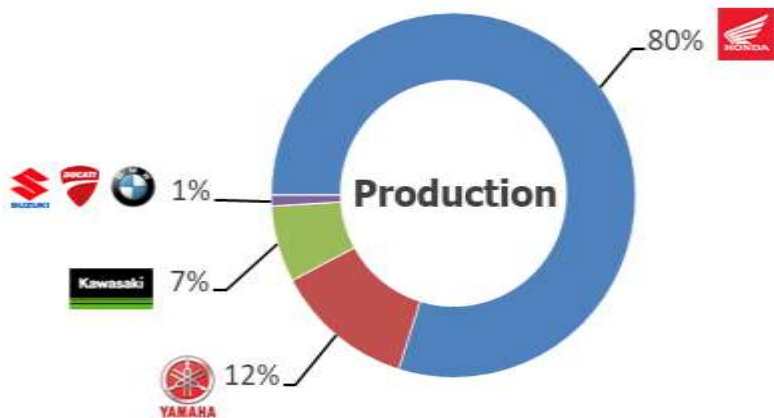
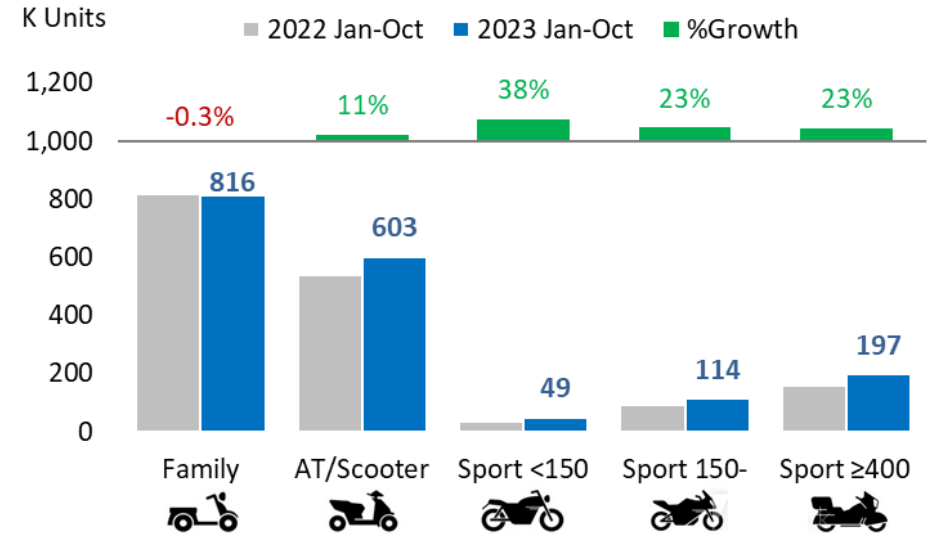


# Thailand Motorcycle Performance

### Production by Brand



### Production by Category



# Thailand Auto-Parts Performance



- Auto-parts export value of January-October 2023 were at **13,744 M** USD from the same period in 2022. (Tyres are excluded)
- Top five exporting counties were (1) USA, (2) Japan, (3) Malaysia, (4) South Africa, and (5) Indonesia, approximately **50%** of total value.
- The highest export value recorded in Y.2018 and Y.2021 was about 17,000 M USD. (550,000 MB if 32 THB/USD)



# Part Manufactured in Thailand

- **Engines**

- Diesels, Motorcycles

- **Engine Components**

- Pumps, Filters, Hoses, Gears, Flywheel

- **Transmissions**

- Gears, Rear Axles, Drive Shafts, Propeller Shafts

- **Brake Systems**

- Master Cylinders, Drums, Discs, Pads, Linings

- **Steering Systems**

- Steering Wheels, Gears, Columns, Pumps, Linkages

- **Electrical/ Electronics**

- Alternators, Starters, Speedometers, Lamps, Motors, Flasher Relays

- **Suspensions**

- Shock absorber, Coils, Ball joint

- **Body parts**

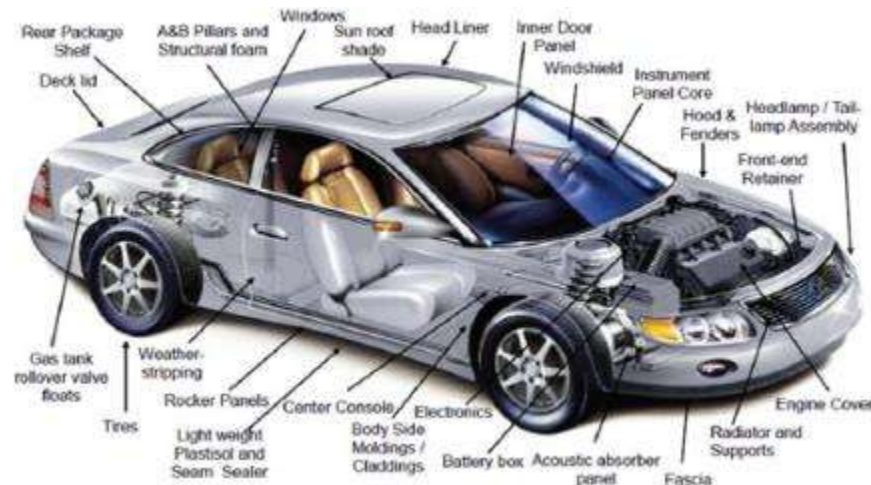
- Chassis, Bumpers, Fenders, Hoods, Door panels

- **Interiors/Exteriors**

- Seats, Mats, Weather Strips, Console Boxes

- **Others**

- Fuel System, Exhaust System, Air Conditioning System



**Main auto-part component of ICE**

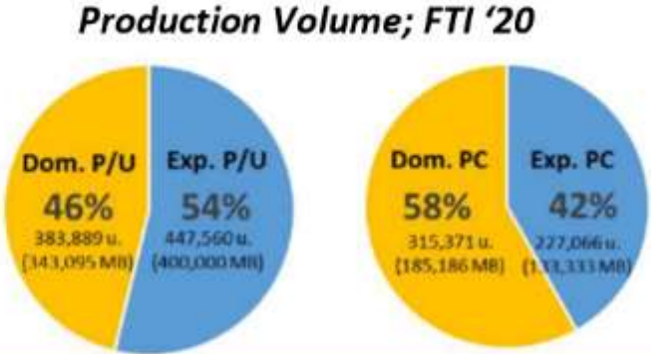
**30,000 pcs/unit**

Ref: <http://www.nap.edu/read/21744/chapter/8#211>

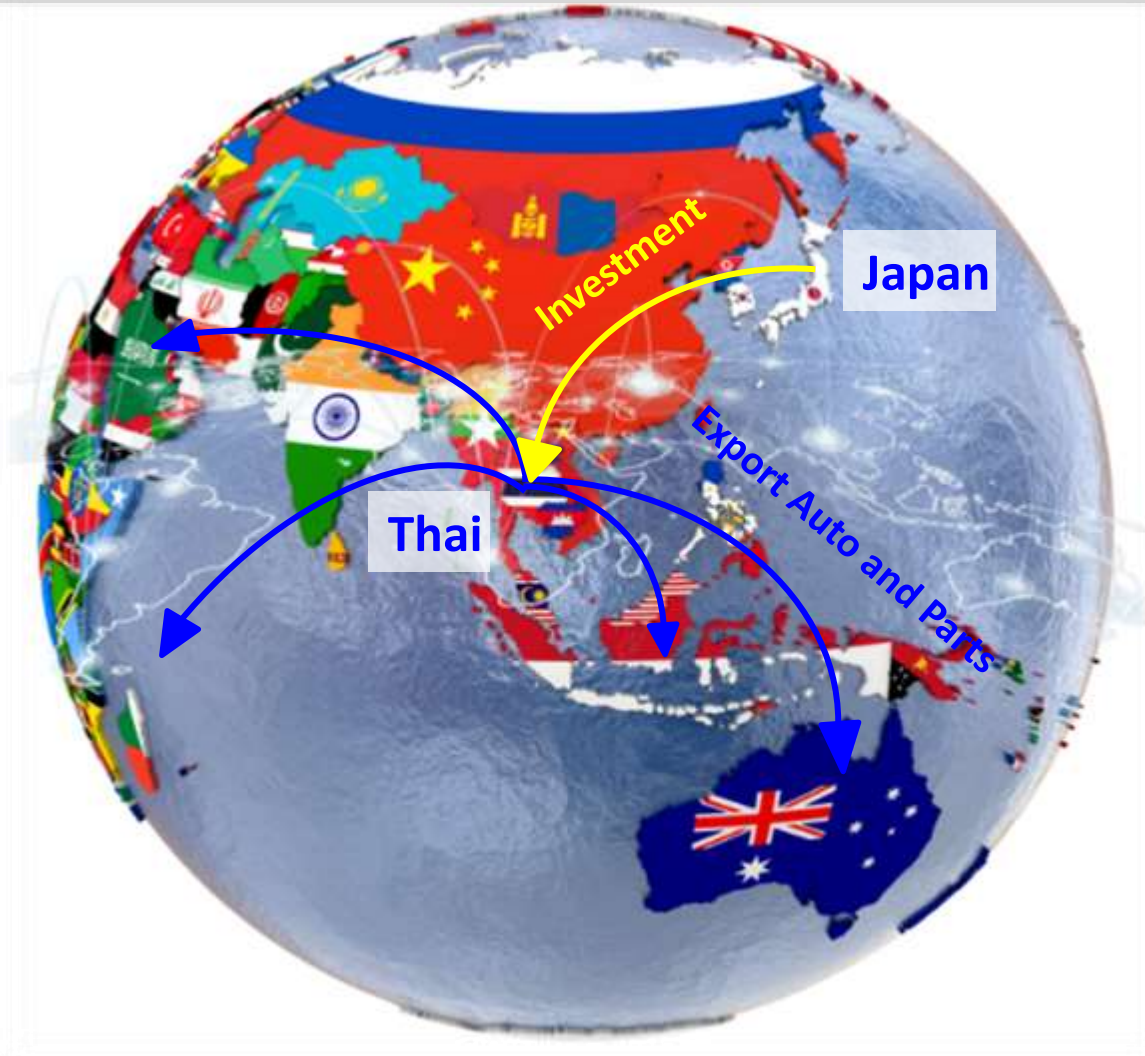
# Production and Export ICE, xEV of Auto Maker and Auto Parts

## Current Model

- Japan uses Thailand for Production and Export Car, Auto-Part to global.
- Export base respective of Product Champion : Pick-up (2<sup>nd</sup> export of world) and Eco Car.
- Current Thailand has cost produce pick-up less than Vietnam 30% because Thailand has Economies of scale.



**Without ICE production volume for domestic will impact to economy of scale (cost competitiveness) for export production [40-60% volume decrease: Domestic (ZEV) and export (non ZEV)]**



# Technological Trends of the Automotive Industry (C-A-S-E)

## Sharing service

1

Emerging new service platforms of transportation are customized and convenient for people in daily life.



## Autonomous/ self-driving vehicle

2

Driverless system must be relied on safety and convenient in driving including effectively connecting with other vehicles.

## Green mobility (E)

3

Car emission would be reduced with electrification system both vehicle technologies PHEV/BEV) and traffic management in urban areas.

## Digitalization of automotive products Through **Connectivity**

4

Connectivity in supply chain by digital system and application in mobile will come into play. Infrastructure and transportation should support digital driving system.

# The Automotive for The Future



## **Key Technology Components**

1. Lithium Battery
2. Motor Drive
3. Control Unit/Drive Control Unit (DCU)
4. Inverter

## **Key Concerned Factors**

1. Domestic and global vehicle demand
2. Sufficient electric charging stations
3. Energy for peak time hour
4. Adequate energy sources
5. Recycling waste management
6. Inconsistent previous government policies



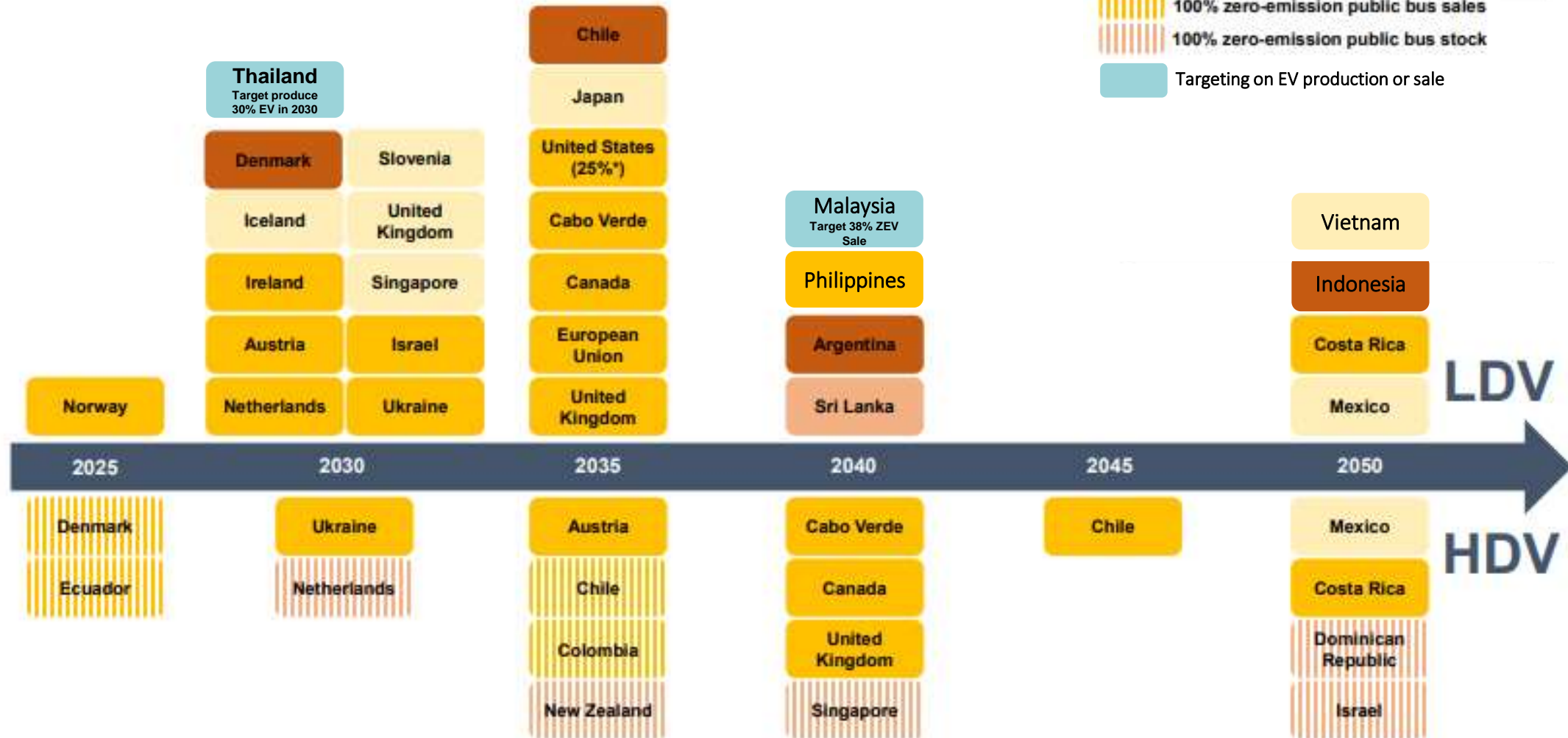


**GLOBAL ZERO-EMISSION VEHICLE MANDATES  
AND ICE-REDUCTION OR BANS**

# Global Zero-Emission Vehicle Mandates and Internal Combustion Engine Reduction or Bans

Legend:







- 100% electrified sales
- 100% ZEV sales
- 100% electrified stock
- ICE ban
- 100% zero-emission public bus sales
- 100% zero-emission public bus stock
- Targeting on EV production or sale





**THAILAND AUTOMOTIVE INDUSTRY**  
**POLICY: 30@30**

# EV Promotional Policies

Country	Target	Cash subsidy	Import duty	Commodity tax	Registration tax
 <b>THA</b>	<ul style="list-style-type: none"> <li>Plans to have EVs account for 30% of domestic automobile production by 2030.</li> </ul>	✓	✓	✓	✓
 <b>IDN</b>	<ul style="list-style-type: none"> <li>The goal is to have 30% of domestic vehicle production be low carbon emission vehicles (BEVs, PHEVs, HEVs, FCEVs) by 2035.</li> </ul>	✓	✓	✓	
 <b>MYS</b>	<ul style="list-style-type: none"> <li>By 2030, 15% of vehicle sales will be electrified vehicles (including HVs). In addition, the ratio of EVs to total vehicle sales will be increased to 38% by 2040.</li> </ul>		✓	✓	✓
 <b>PHL</b>	<ul style="list-style-type: none"> <li>The plan is to establish a "Comprehensive Roadmap for the EV Industry" in 2023, including the practical end of internal combustion engine vehicle sales in the Philippines by 2040.</li> </ul>		✓		
 <b>VNM</b>	<ul style="list-style-type: none"> <li>Banning the import and production of internal combustion engine vehicles from 2040.</li> </ul>			✓	✓
 <b>SGP</b>	<ul style="list-style-type: none"> <li>Plans to phase out internal combustion engine vehicles by 2040 and switch to eco-friendly vehicles such as EVs.</li> </ul>				✓

Thai Government will keep on the policy to achieve **Carbon Neutrality** to make Thailand become the leadership of carbon reduction in ASEAN. Government will promote the manufacturing of '**Zero Emission Vehicle**' and targeting to produce EV at 30% of total within 2030

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*Srettha Thavisin (October 16<sup>th</sup>, 2023)*



# 30@30 Thailand EV Policy

30% of all vehicles made in Thailand will be electric by 2030, according to a three-phase development plan for electric vehicle (EV) industry.

## Phase I: 2021-2022

- The government will promote electric motorcycles and support infrastructure nationwide.



## Phase II: 2023-2025

- The EV industry will be developed to produce:
  - 225,000 cars and pick-up trucks,
  - 360,000 motorcycles
  - 18,000 buses/trucks
- By 2025, including the production of batteries.
- This first milestone is designed to deliver cost advantages via economies of scale.

## Phase III: 2026-2030

- This phase is driven by the “**30/30 policy**” to produce:
  - 725,000 EV cars and pick-ups
  - 675,000 EV motorcycles.
- This will account for 30% of all auto production in 2030 and includes domestic manufacture of batteries.

# Thailand EV policy

สรุปประเด็นสำคัญจากการประชุมคณะกรรมการนโยบายยานยนต์ไฟฟ้าแห่งชาติ ครั้งที่ 2/2564 วันที่ 12 พ.ค.64

1

เห็นชอบเป้าหมายการผลิต และการใช้ ZEV ทุกประเภท โดยเฉพาะเป้าหมายฯ ปี 2025 และ 2030 (30@30) เพื่อต้องการให้เกิดการดึงดูดการลงทุนในปี 2022 และเริ่มปิดหมุดการลงทุนในปี 2023 เท่านั้น (รับทราบเป้าหมายฯ ปี 2035)

## การใช้



## การผลิต



ประเภทยานยนต์	ปี 2025	ปี 2030	ปี 2035
รถยนต์นั่ง/รถกระบะ	225,000 (30%)	440,000 (50%)	1,154,000 (100%)
รถจักรยานยนต์	360,000 (20%)	650,000 (40%)	1,800,000 (100%)
รถบัส/รถบรรทุก	18,000 (20%)	33,000 (35%)	83,000 (100%)
สามล้อ	500 (85%)	2,200 (100%)	2,800 (100%)
เรือโดยสาร	130 (12%)	480 (35%)	1,800 (100%)
รถไร้ระบบราง	620 (70%)	850 (85%)	1,170 (100%)
รถยนต์นั่ง/รถกระบะ	225,000 (10%)	725,000 (30%)	1,350,000 (50%)
รถจักรยานยนต์	360,000 (20%)	675,000 (30%)	1,850,000 (70%)
รถบัส/รถบรรทุก	18,000 (35%)	34,000 (50%)	84,000 (85%)
สามล้อ	500 (85%)	2,200 (100%)	2,800 (100%)
เรือโดยสาร	130 (12%)	480 (35%)	1,800 (100%)
รถไร้ระบบราง	620 (100%)	850 (100%)	1,170 (100%)

Thai National EV board will focus on 30/30 BEV production at medium term target. (ข้อมูลประกอบการยื่นขอ BOI)

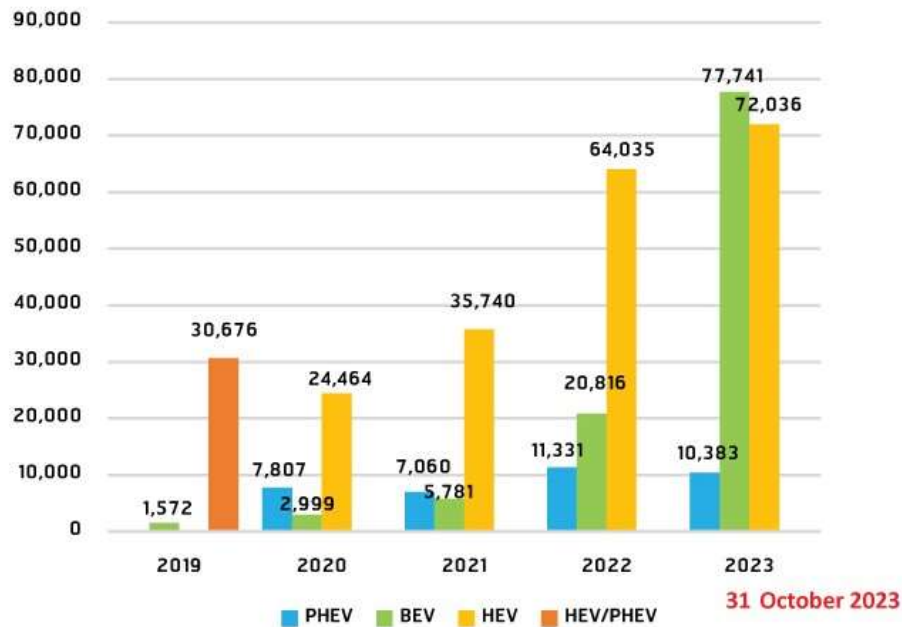
# Status of xEV Accumulated Registration in Thailand.



## New Number of xEV Registration จำนวนยานยนต์ไฟฟ้าที่จดทะเบียนใหม่

Between 2019-2023  
ระหว่างปี 2562 - 2566

### จำนวนยานยนต์ไฟฟ้าที่จดทะเบียนใหม่



## New Number of xEV Registration in 2023 จำนวนยานยนต์ไฟฟ้าที่จดทะเบียนใหม่

1 January - 31 October 2023  
1 ม.ค. - 31 ต.ค. 2566

PHEV

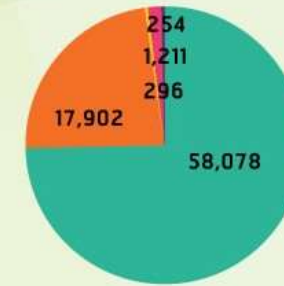
10,383



- Car (10,383) รถยนต์
- Motorcycle (0) รถจักรยานยนต์
- Tuk Tuk (0) รถสามล้อ
- Bus (0) รถโดยสาร
- Truck (0) รถบรรทุก

BEV

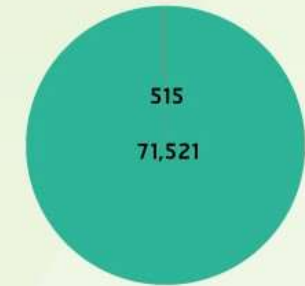
77,741



- Car (58,078) รถยนต์
- Motorcycle (17,902) รถจักรยานยนต์
- Tuk Tuk (296) รถสามล้อ
- Bus (1,211) รถโดยสาร
- Truck (254) รถบรรทุก

HEV

72,036



- Car (71,521) รถยนต์
- Motorcycle (515) รถจักรยานยนต์
- Tuk Tuk (0) รถสามล้อ
- Bus (0) รถโดยสาร
- Truck (0) รถบรรทุก



# EV vs. Supply Chain

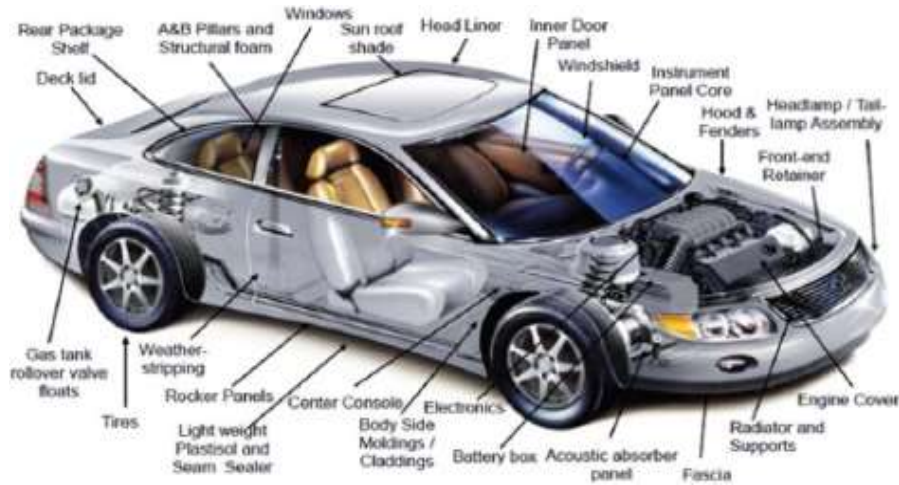
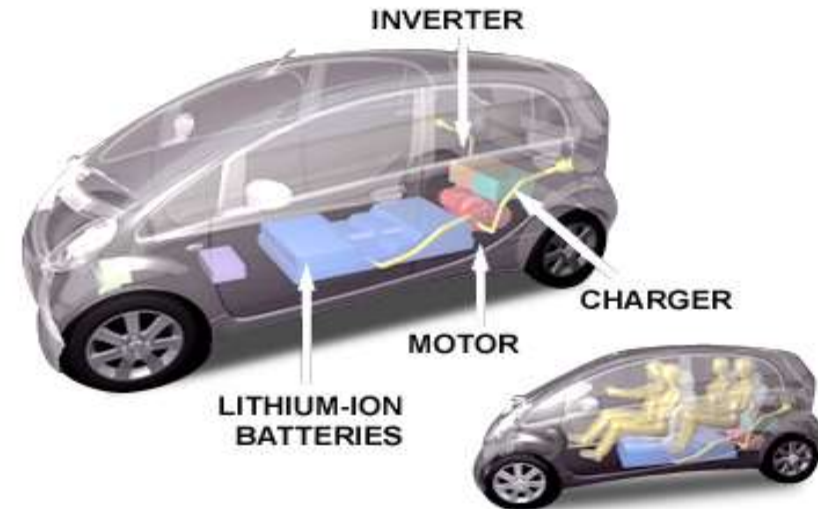


Figure 2:  
**Main auto-part component of BEV**  
**3,000 pcs/unit (16 Module)**

Ref: <https://infograph.venngage.com/p/94610/technology-in-cars>

Figure 1:  
**Main auto-part component of ICE**  
**30,000 pcs/unit**

Ref: <http://www.nap.edu/read/21744/chapter/8#211>



# EV vs. Supply Chain

## ▪ ~~Engines~~

- Diesels, Motorcycles

## ▪ ~~Engine Components~~

- Pumps, Filters, Hoses, Gears, Flywheel

## ▪ ~~Transmissions~~

- Gears, Rear Axles, Drive Shafts, Propeller Shafts

## ▪ Brake Systems

- Master Cylinders, Drums, Discs, Pads, Linings

## ▪ Steering Systems

- Steering Wheels, Gears, Columns, Pumps, Linkages

## ▪ Electrical/ Electronics

- ~~Alternators, Starters, Speedometers,~~  
Lamps, Motors, Flasher Relays

## ▪ Suspensions

- Shock absorber, Coils, Ball joint

## ▪ Body parts

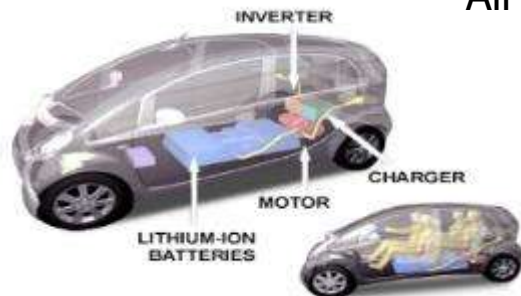
- Chassis, Bumpers, Fenders, Hoods, Door panels

## ▪ Interiors/Exteriors

- Seats, Mats, Weather Strips, Console Boxes

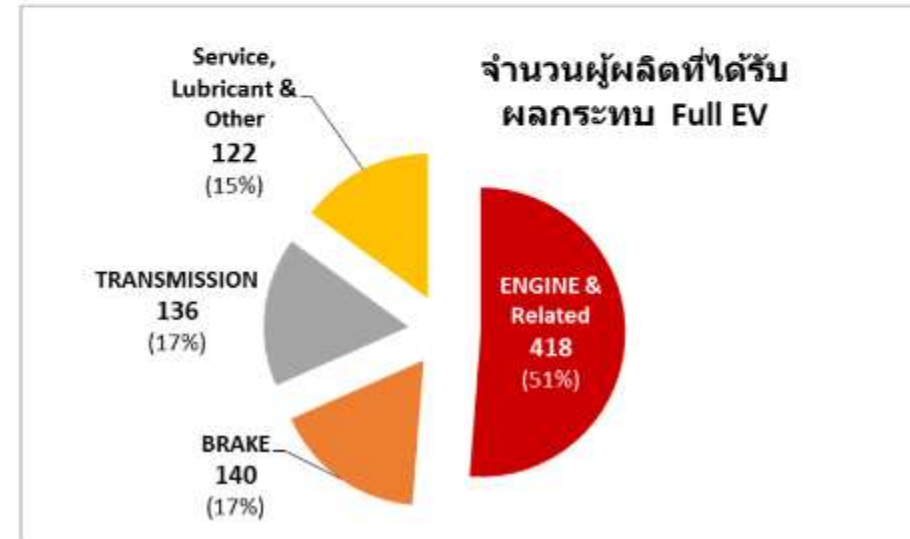
## ▪ Others

- ~~Fuel System, Exhaust System,~~  
Air Conditioning System



## กรณี เปลี่ยนเป็น BEV 100%

- ผู้ผลิตชิ้นส่วนที่ได้รับผลกระทบทั้งสิ้น  
**49** รายการ = **816** บริษัท  
แรงงาน **326,400** คน
- อุตสาหกรรมสนับสนุน  
แม่พิมพ์ **JIGS & FIXTURES**  
ได้รับผลกระทบจำนวน **183** บริษัท



# ZEV Part

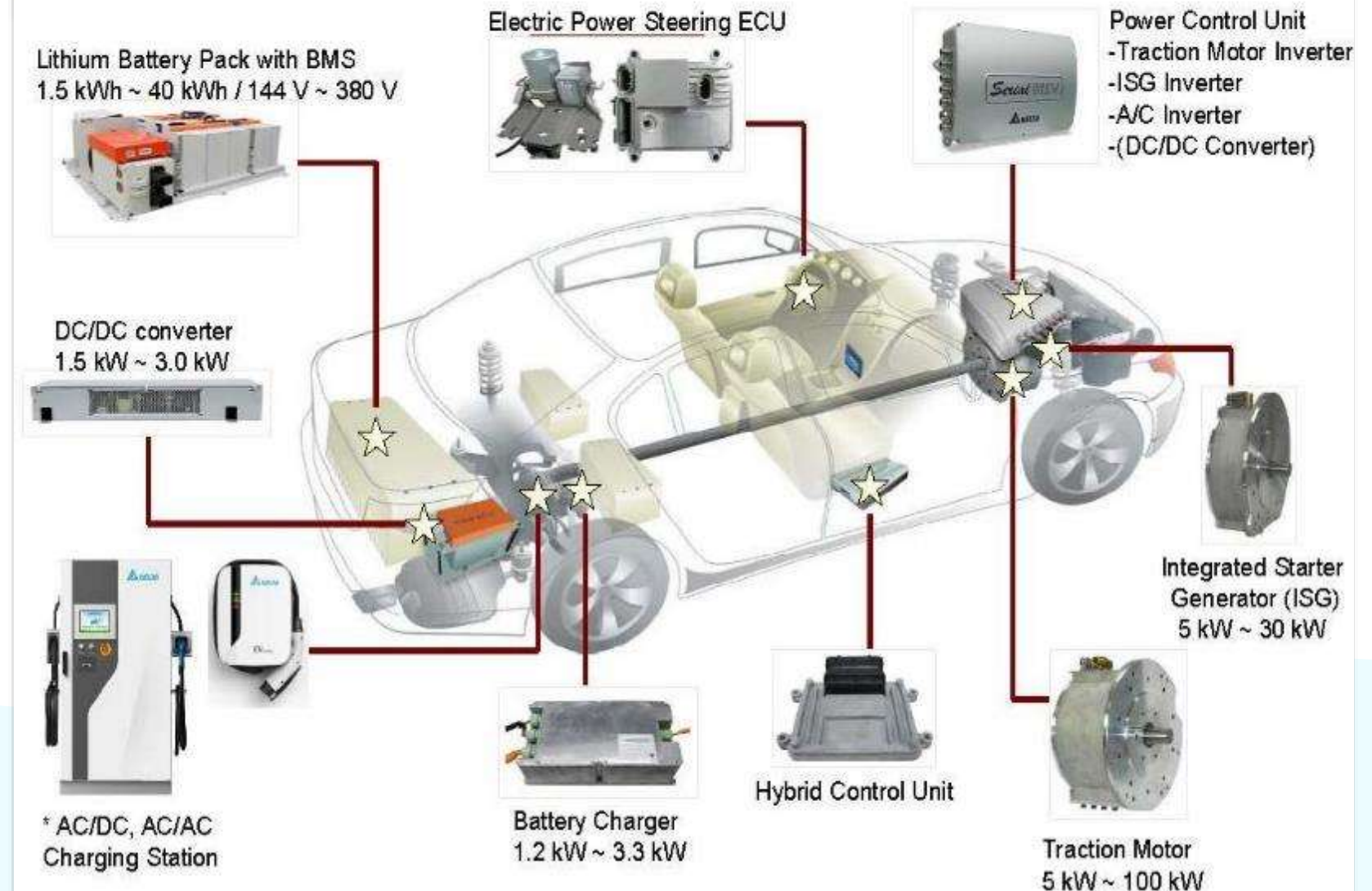
## Core EV Parts

- Battery
- Traction Motor
- BMS
- DCU

## Additional EV Parts

- Air Conditioning System/Part
- DC/DC Converter
- Front/Rear Axle for EV bus
- Electrical Circuit Breaker
- Portable EV Charger
- Smart Charging System
- On-Board Charger
- Inverter
- EV Connector (Plug & Socket)
- HV Harness
- Reduction Gear
- Battery Cooling System
- Regenerative Braking System

## HEV/EV Passenger Car Powertrain Solution



# EV promoted project

(ที่มา: ฐานข้อมูล สกท. ณ วันที่ 13 มีนาคม 2566)

Project			Approved project	Granted document	Manufactured & Commercialized
86,854.1 ลบ. (ไม่รวมค่าที่ดินและเงินทุนหมุนเวียน)	26 โครงการ (17 บริษัท) *	860,195 คัน	26	17	11
HEV (38,623.9 ล้านบาท)	7 โครงการ (7 บริษัท)	440,955 คัน			
PHEV (11,619.7 ล้านบาท)	8 โครงการ (8 บริษัท)	137,600 คัน			
BEV (34,436.7 ล้านบาท)	15 โครงการ (14 บริษัท)	277,640 คัน			
Battery Electric Bus (2,173.8 ล้านบาท)	2 โครงการ (2 บริษัท)	4,000 คัน			



หมายเหตุ \* โครงการ หมายถึง ข้อเสนอแผนการลงทุนเพื่อผลิตรถยนต์ไฟฟ้าใน 1 บัตรส่งเสริมการลงทุน โดยใน 1 โครงการอาจจะผลิตรถยนต์ไฟฟ้ามากกว่า 1 ชนิด และบางบริษัทฯ ได้รับส่งเสริมการลงทุนมากกว่า 1 โครงการ

# Auto-parts for EV promoted project



EV parts	16 projects (14 company)	Invest ** 5,120 MB	promoted companies
Traction Motor	7 โครงการ (7 บริษัท)	2,586.0 MB	กราฟีนแบตเตอรี่ อักพลิ่ง
Air Conditioning System	2 โครงการ (1 บริษัท)	557.3 MB	
Battery Management System	3 โครงการ (3 บริษัท)	237.6 MB	กราฟีนแบตเตอรี่
Driving Control Unit	2 โครงการ (2 บริษัท)	107.5 MB	กราฟีนแบตเตอรี่
On - board Charger	2 โครงการ (2 บริษัท)	644.0 MB	กราฟีนแบตเตอรี่
Charging Devices	2 โครงการ (2 บริษัท)	157.0 MB	
DC/DC Converter	1 โครงการ (1 บริษัท)	309.4 MB	
Inverter	1 โครงการ (1 บริษัท)	309.4 MB	
High - voltage Harness	3 โครงการ (3 บริษัท)	118.2 MB	
Battery Cooling System	1 โครงการ (1 บริษัท)	93.7 MB	

หมายเหตุ \* 1 บริษัทสามารถได้รับการส่งเสริมมากกว่า 1 โครงการ หรือ 1 ผลิตภัณฑ์  
 \*\* เงินลงทุนโดยไม่รวมค่าที่ดินและเงินทุนหมุนเวียน  
 \*\*\* บริษัท Delta และกราฟีนแบตเตอรี่ ใน 1 โครงการผลิตมากกว่า 1 ผลิตภัณฑ์ มูลค่าการลงทุนจึงประมาณการด้วยวิธี Product Allocation



**ASEAN-China  
FTA**

**CHINA**



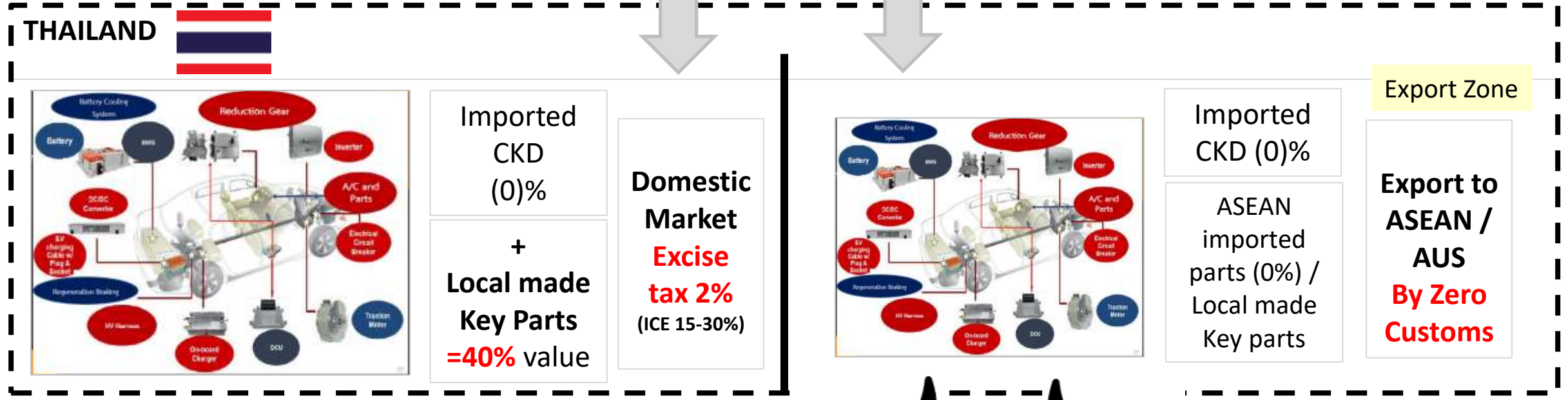








**CKD Customs 0%**



**FTA**

**FTA**

**ASEAN countries**








**AUSTRALIA / NZ**




# 10th

## GLOBAL PRODUCTION

Source : OICA

# 1st

## ASEAN PRODUCTION

# INDUSTRY TRANSFORMATION WITH STRONG GLOBAL PRODUCTION HUB

## 70@30

### FUTURE ICE

ICE : internal combustion engine  
HEV : HYBRID ELECTRIC VEHICLE  
PHEV : PLUG-IN HYBRID ELECTRIC VEHICLE  
REEV : RANGE-EXTENDER ELECTRIC VEHICLE

## 30@30

### ZEV

ZEV : ZERO EMISSION VEHICLE  
BEV : BATTERY ELECTRIC VEHICLE  
FCEV : FUEL CELL ELECTRIC VEHICLE

# 170

## EXPORTING COUNTRIES

# 1,400

## SUPPLIER

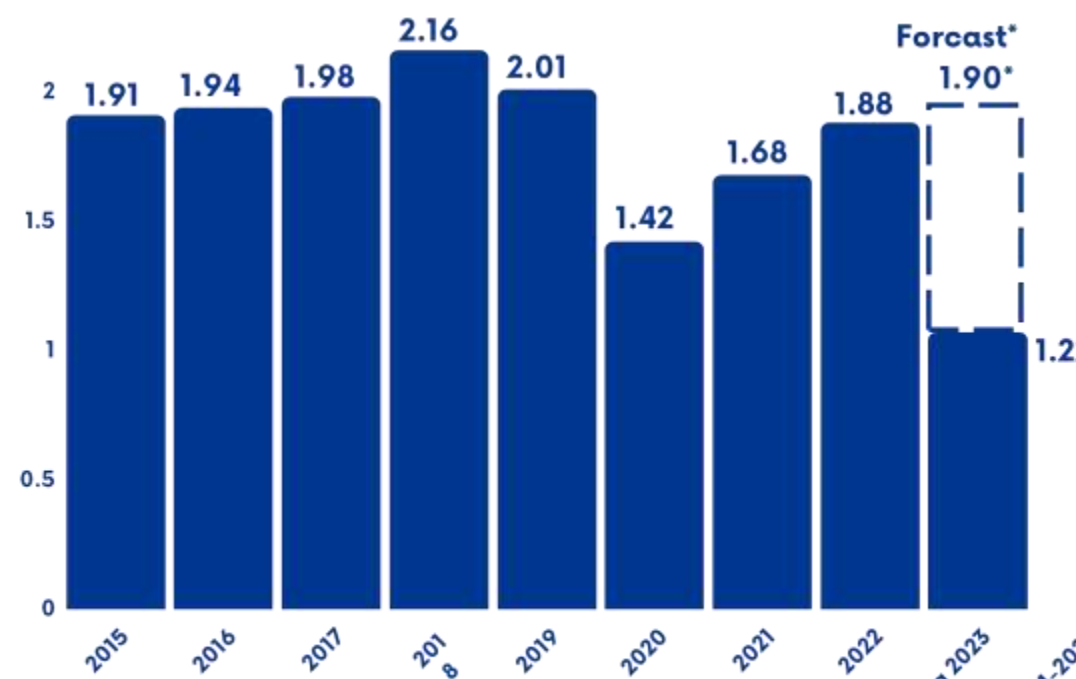
# 750,000

## LABORS

# 11%

## INDUSTRIAL GDP share

### Thailand Automotive Production



## 2030 THAILAND AUTOMOTIVE PRODUCTION TARGET 2,500,000



Export Future ICE & ZEV in Y2030 1,500,000

SOURCE : สำนักงานคณะกรรมการส่งเสริมการค้าระหว่างประเทศ

# How does Thai Auto-part maker cop with this situation ?



## Main process in Automotive and Auto-parts manufacturing

Car manufacturing process



Auto-parts

**Metal forming**

- Casting , Rolling
- Stamping
- Hot Forging , Cold forging

**Machining**

- Milling , Turning
- Lathe , Facing , CNC

**Surface finishing**

- Heat Treatment , Plating
- Surface Treatment , Paint

**Assembly**

- Design , Welding
- Soldering , Tighten
- Rivet , Fitting
- Brazing , Adhesive

**Automation & IoT**  
(supporting)

- Advanced PLC / SCADA
- Embedded command

**Automation Basic**

- PLC , Sequence control
- Sensor / Relay / Timer
- Pneumatic , การออกแบบหัวจับ



Powertrain

Hybrid Engine, Motor



Suspension

Light weight, Motor brake



Interior



Electrical & Electric

BMS, Invertor, DCU, LIDAR, RADAR, ADS, Camera, Laser Scanner, GNSS, , IMU, Actuator



Body and Chassis

**Light weight vehicle**



Energy Storage

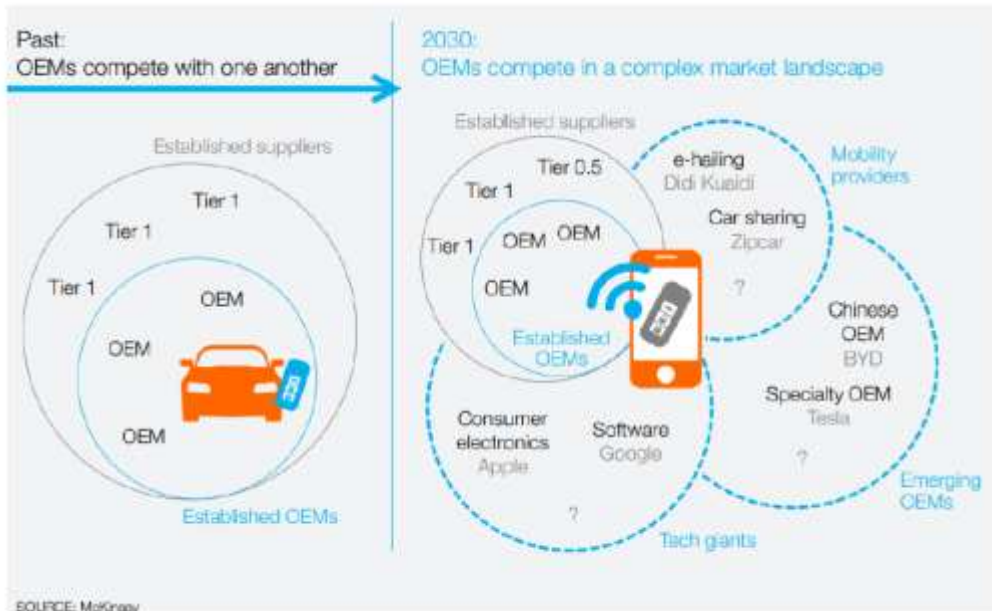
Electrical Air Conditioner





# How does Thai Auto-part maker penetrate into EV supply chain ?

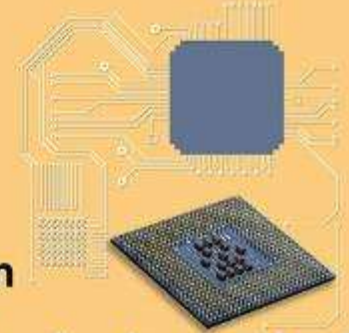
- **Mechanic +Electronics Integration**
- Semiconductor technology
- Start to supply CAV (Connected Autonomous Vehicle) first.
- Enter to Supply chain of Battery, Motor, ECU



BOI adds benefits for the upstream manufacturing of

## SEMICONDUCTOR

to cover the whole supply chain



### Group 1 Manufacture of Semiconductor

#### Front-end Semiconductor

- For example:
- ★ Electronics design
  - ★ Silicon Wafers
  - ★ Wafer FAB

**10-year**  
Corporate Income Tax  
Exemption

requiring advanced technology and innovation

#### Back-end Semiconductor

For example:

- ★ Wafer SORT
- ★ Assembly
- ★ Die Bank
- ★ IC Testing

**8-year**  
Corporate Income Tax  
Exemption

with machinery  
investment  
of at least  
1.5 billion baht

**5-year**  
Corporate Income Tax  
Exemption

with machinery  
investment  
of less than  
1.5 billion baht

### Group 3 Manufacture of Printed Circuit Board Assembly (PCBA)

For example:

- ★ Box build
- ★ Pack/Ship
- ★ Product Test

**5-year**  
Corporate Income Tax  
Exemption

with machinery  
investment  
of at least  
500 million baht

**3-year**  
Corporate Income Tax  
Exemption

with machinery  
investment  
of less than  
500 million baht

### Group 2 Manufacture of Advanced Printed Circuit Board (PCB), including flexible PCB or multi-layer PCB

For example:

- ★ PCB FAB
- ★ SMT
- ★ PCBA Test
- ★ FA Lab
- ★ PTH

**8-year**  
Corporate Income Tax  
Exemption

with machinery  
investment  
of at least  
1.5 billion baht

**5-year**  
Corporate Income Tax  
Exemption

with machinery  
investment  
of less than  
1.5 billion baht




**Merit-based Incentive**

Semiconductor projects with further investment in Research & Development (R&D) will be eligible to additional Corporate Income Tax Exemption for up to 5 years


\*The number of additional years of tax incentives depends on the amount of R&D investment



Tier 1




1



Tier 2 and 3

3




2



4



1

Main goal:  
อุตสาหกรรมยานยนต์สมัยใหม่

2

Main goal:  
อุตสาหกรรมยานยนต์เดิม  
หุ่นยนต์อุตสาหกรรม  
อุตสาหกรรมระบบราง

3

Main goal:  
อุตสาหกรรมยานยนต์สมัยใหม่

4

Main goal:  
หุ่นยนต์อุตสาหกรรม  
อุตสาหกรรมระบบราง

# แผนยุทธศาสตร์เพื่อการขับเคลื่อนอุตสาหกรรมชิ้นส่วนยานยนต์



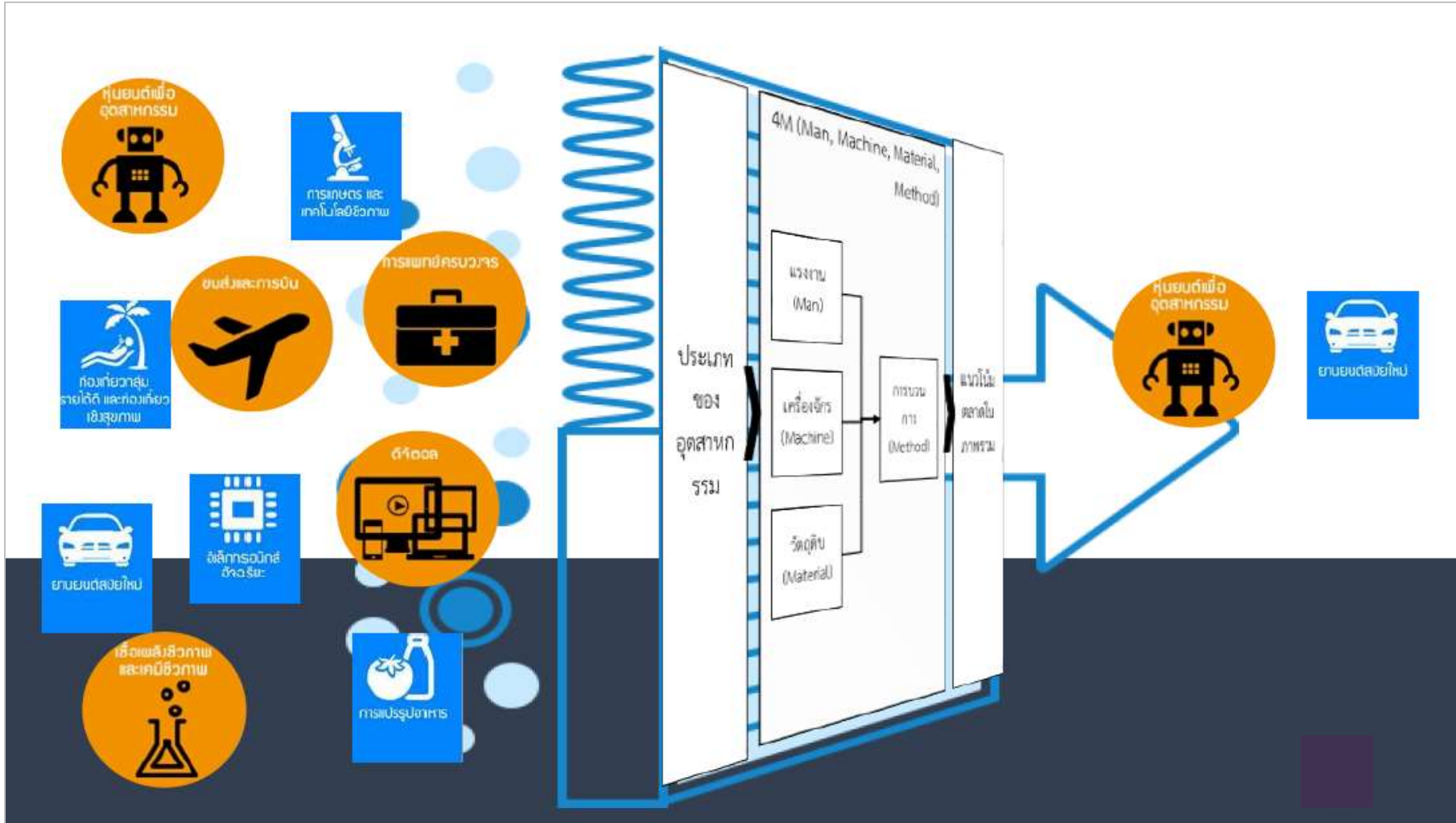
## Vision

“ผู้ประกอบการไทยเป็นส่วนสำคัญในห่วงโซ่อุปทานของอุตสาหกรรมยานยนต์สมัยใหม่ และพัฒนาชิ้นส่วนมูลค่าสูงเพื่อตอบสนองตลาด”

“ผู้ประกอบการไทยสามารถพัฒนาระบบอัตโนมัติที่มีคุณภาพ ใช้ประโยชน์ในเชิงพาณิชย์ และเป็นห่วงโซ่อุปทานในอุตสาหกรรมหุ่นยนต์”

“ผู้ประกอบการไทยเป็นส่วนสำคัญในห่วงโซ่อุปทานของอุตสาหกรรมระบบราง และมีความสามารถในการผลิตชิ้นส่วนและให้บริการซ่อมบำรุงระบบราง”

# Which is possible next S-Curve for Auto-part maker ?



Rail system

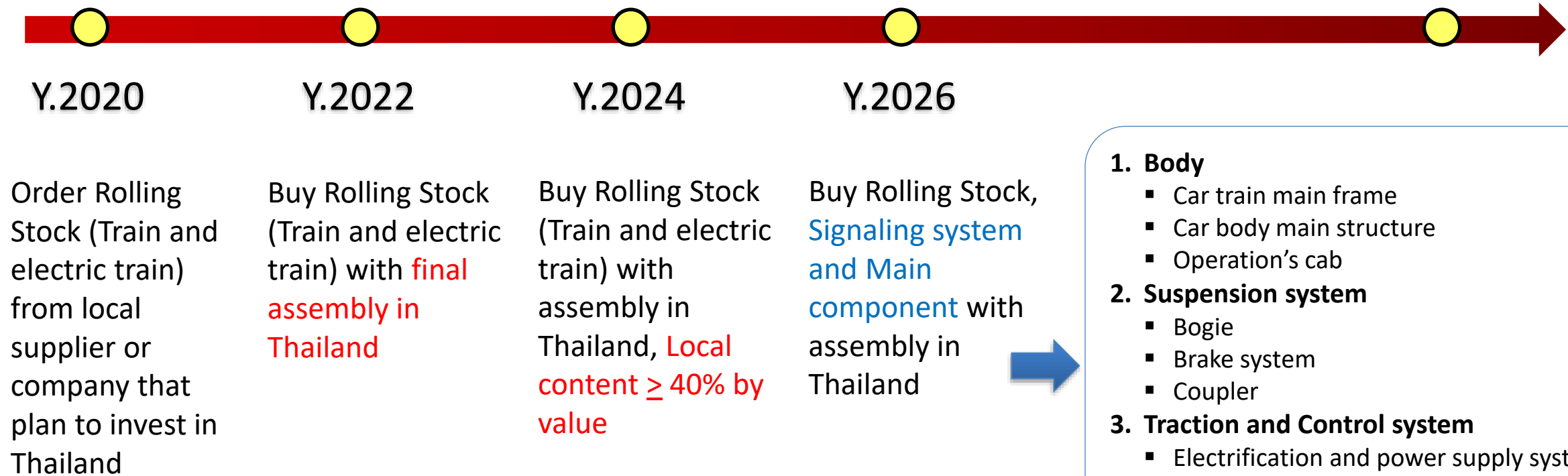


Auto-parts REM

# Thai Auto-parts maker opportunity : Rail system



## DEVELOPMENT PLAN OF THAILAND'S RAILWAY INDUSTRY



# Thai Auto-parts maker opportunity : REM

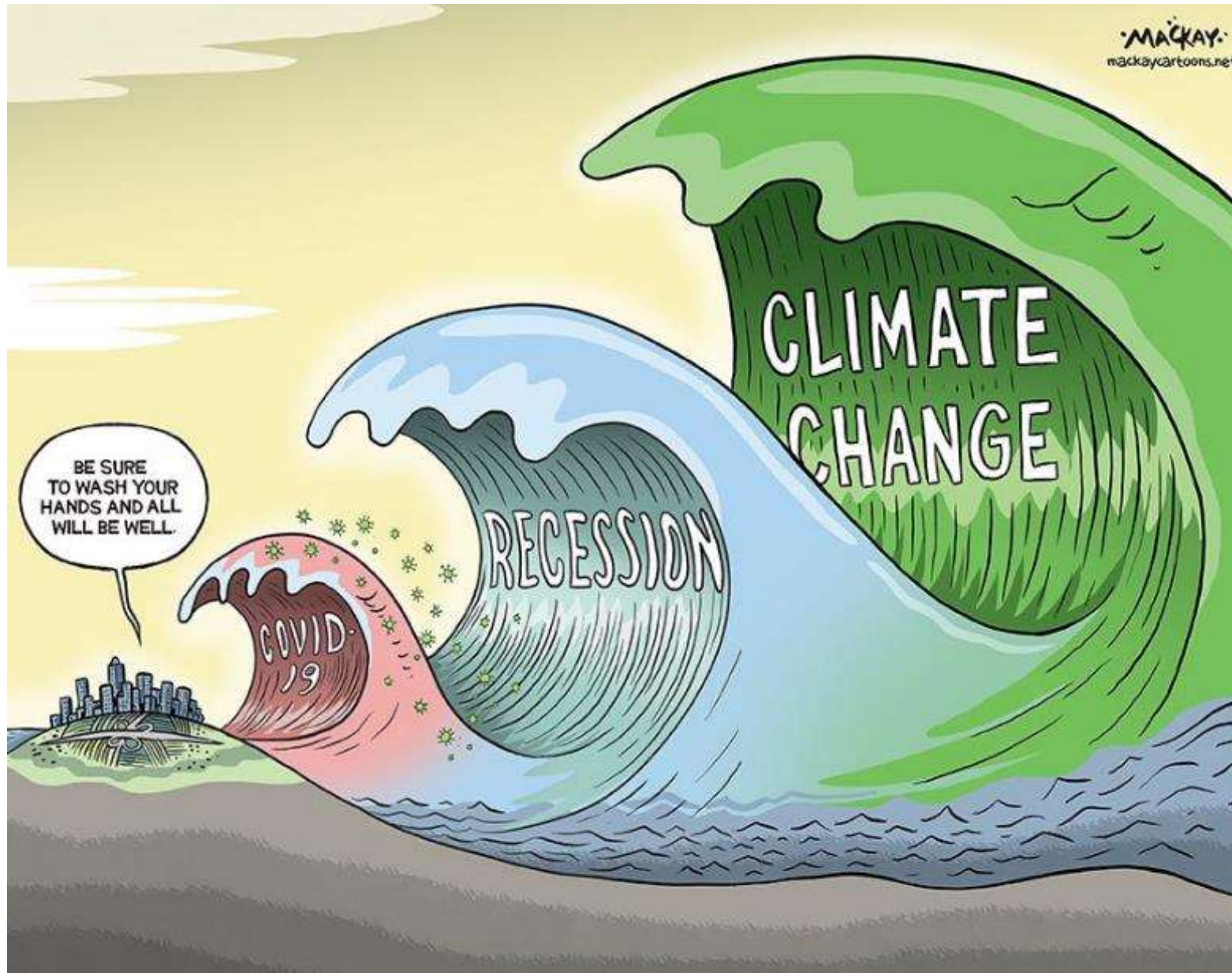
## Increasing Average Age of Vehicles

Accumulated car = **2,000** Million units  
Average age **9.5-11.5** yrs

The latest innovations have resulted in the increased average age of a vehicle and its improved resilience. Over a couple of decades, the average age has gone up from 9.5 years to 11.5 years. Further increase in average age is inevitable in the coming years.

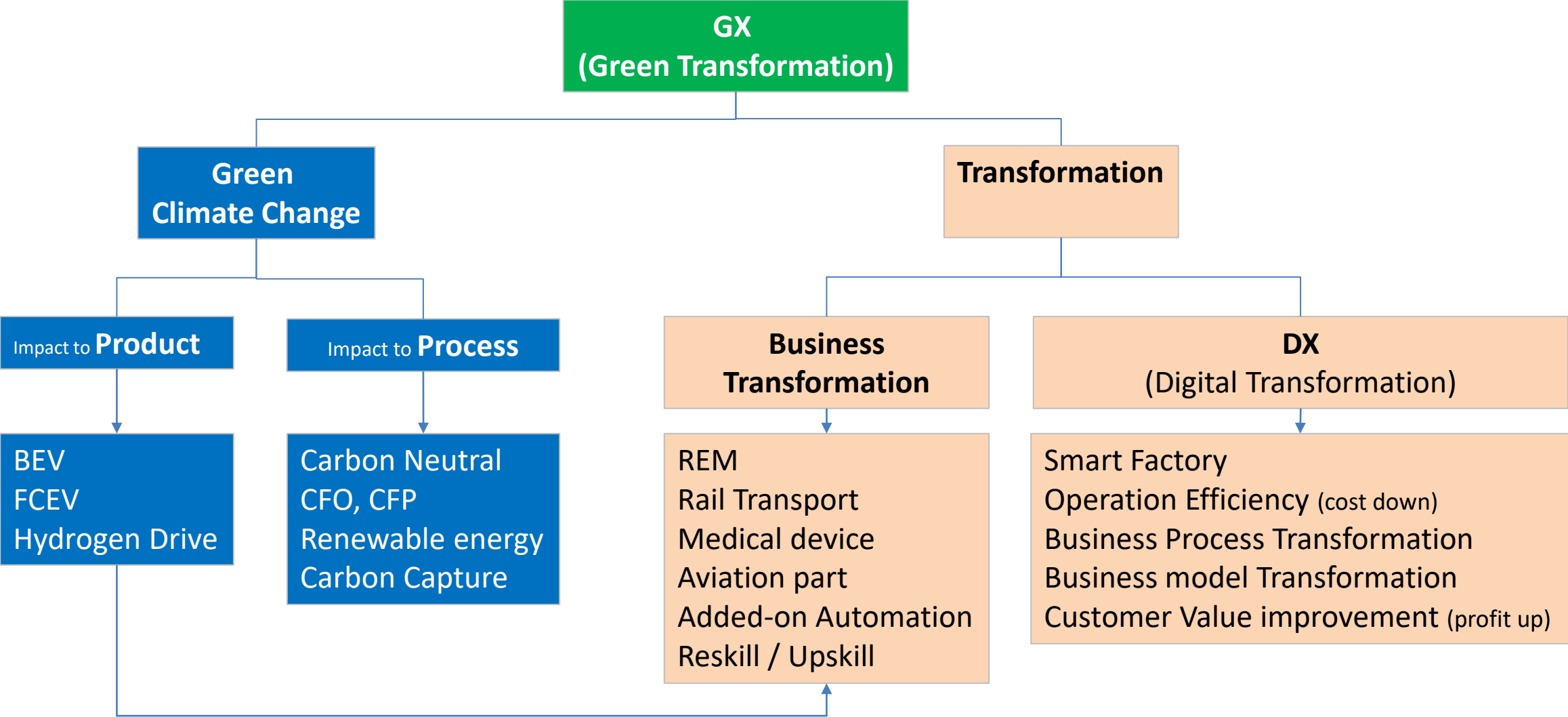
It is a boon for the aftermarket industry since older vehicles will need more auto parts to be replaced and repaired. This demand will contribute to increased revenue of the automotive aftermarket industry.





Source : <https://mackaycartoons.net/tag/climate-change/>

# How to cope with Disruptive ?







**Thank You for Your Kind Attention**