



Thailand Automotive Industry Situation from ICE to Next-generation Vehicle

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Vice President, Thailand Automotive Institute

6th July 2023

Topics

1. Introduction about Thailand Automotive Institute's role
2. Overview of Thailand Automotive Industry and the Next Generation Vehicles and Trend
3. Conclusion



Topics >

1. Introduction about Thailand Automotive Institute's role



- Thailand Automotive Institute established since 14th September 1998 by the Cabinet Resolution in July 1997

VISION “Institute for Learning and Development of Smart Mobility”

MISSION

1. Act as the center of information and expertise for the Thai automotive industry development
2. Assist in implementation of standards and inspection/testing of products, and innovation development
3. Develop human resources in the Thai automotive industry and related industries
4. Conduct research and development as well as upgrade business operators' capabilities
5. Coordinate and collaborate with local and overseas agencies for the Thai automotive industry development



BANGKOK

Kluynamthai Office
Soi trimitr, Rama 4 Road,
Klongtoey, Bangkok



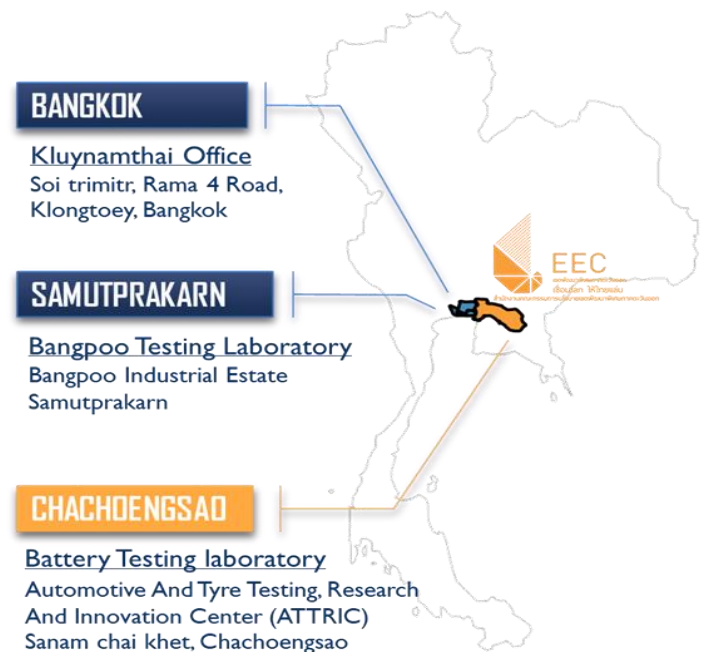
SAMUTPRAKARN

Bangpoo Testing Laboratory
Bangpoo Industrial Estate
Samutprakarn



CHACHOENGSAO

Battery Testing laboratory
Automotive And Tyre Testing, Research
And Innovation Center (ATTRIC)
Sanam chai khet, Chachoengsao



Testing and R&D Center

- Testing services
- Engineering services
- International certification and homologation services
- Standard / Regulatory supports

Audit and Assessment

- Inspection body
- Free trade zone



Automotive Intelligence Center

- Policy research
- Intelligence units

Entrepreneur Development

- Human resources development
- Consulting services

Automotive Industry networking

- Automotive supply chain
- Car maker
- Government affair

Automotive Tyre Testing, Research and Innovation Center (ATTRIC)



THAILAND AUTOMOTIVE INSTITUTE สถาบันยานยนต์

เปิดให้บริการแล้ววันนี้

สนามทดสอบยานยนต์ และยางล้อมาตรฐานสากล

UN R117	UN R13
UN R41	UN R13H
UN R51	UN R79








Skid Pad Dynamic Platform Wet Grip Track Noise Track Park Brake or Hill Broke Performance

สอบถามรายละเอียดเพิ่มเติมได้ที่: ศูนย์ทดสอบฯ สถาบันยานยนต์
โทร. 02-324-0710 ต่อ 134, 135 อีเมล: tsa@thaiauto.or.th



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SEAT

การทดสอบเบาะที่นั่ง พนักพิงหลัง และพนักพิงศีรษะ UN R17, UN R25

และทดสอบตามมาตรฐานผลิตภัณฑ์อุตสาหกรรม (มอก.)
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THAILAND AUTOMOTIVE INSTITUTE สถาบันยานยนต์

Electric Vehicle Battery Testing Center

UNECE R100
UNECE R136

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Next-Generation Vehicle - Ecosystem

EV Battery Testing Center

EV Battery
Testing Center



UNECE R100












Land Transport
Department



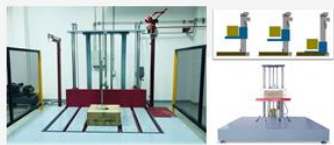


Thai Industrial
Standard Institute



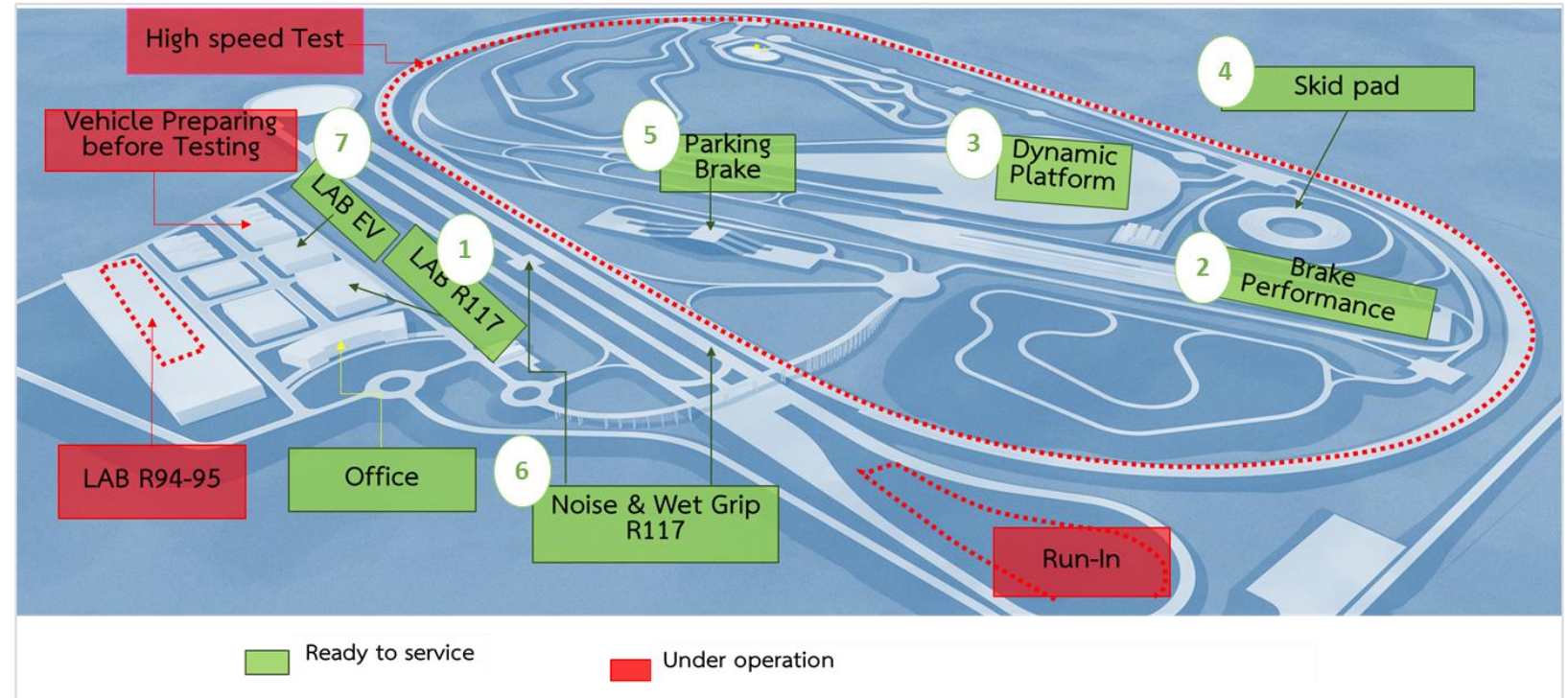
(1)  Vibration การสั่นสะเทือน	(2)  Thermal shock and cycling การทนอุณหภูมิ	(3)  Mechanical shock การเปลี่ยนแปลงความเร่งฉับพลัน
(4)  Mechanical integrity ความแข็งแรงของโครงสร้างชุดแบตเตอรี่	(5)  Fire resistance การทนไฟ	(6)  External short circuit protection การลัดวงจร
(7)  Overcharge protection ระบบป้องกันการชาร์จเกิน	(8)  Over-discharge protection ระบบป้องกันดิสชาร์จเกิน	(9)  Over temperature protection ระบบป้องกันอุณหภูมิเกิน



UNECE R136

(1)  Drop test	(2)  Mechanical shock
(3)  Water resistance	

Progress and Next Step Plan



1. Tyre and Automotive parts testing Lab

- UN R14, R16 – Safety Belts, S.B. Anchorage
- R17, R25 – Seats, Head Restraints
- UN R117 - Tyres
- UN R13, R13H – Braking System
- UN R41-R51 Pass by Noise
- UN R78 – Brake Motorcycle
- UN R79 –Steering Equipment

2. Brake Performance

3. Dynamic Platform

4. Skid pad

5. Parking Brake

6. Noise & Wet Grip

7. EV Battery (UN R100 R136)

1. High Speed Test Track (2026)

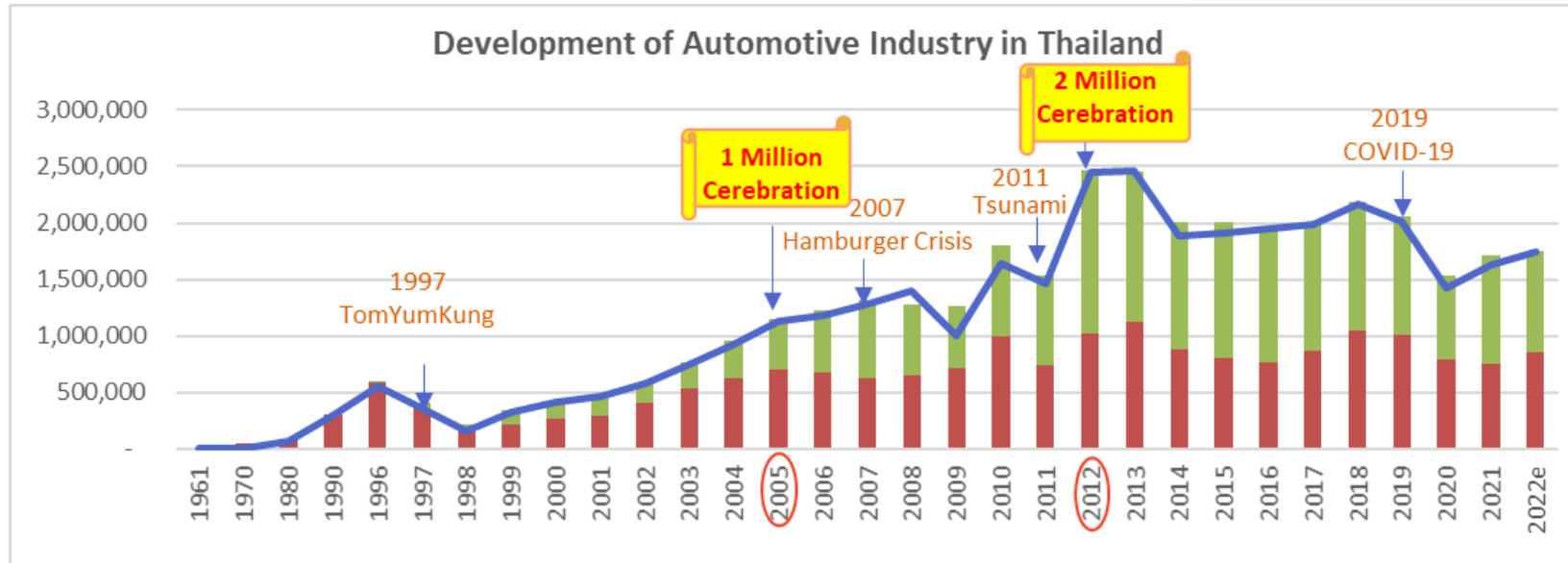
2. R94-95 Crash Test (2026)

3. Run-in

Topics >>

2 Overview of Thailand Automotive Industry and the Next Generation Vehicles and Trend





Thailand 2.0			Thailand 3.0		Thailand 4.0
Local production			Production base		Innovation base
Localization policy			Product champion policy		Clean-Save-Safe
1965-1970	1971-1986	1987-1997	1998-2005	2006-2016	2017-Now
Import substitution	Enforcement	Opportunity & Threat	Liberalization	Cost competition & Alternative energy	Next generation of automotive
<ul style="list-style-type: none"> Investment promotion 	<ul style="list-style-type: none"> Mandated in Local content 25% License 42 Ban CBU import 	<ul style="list-style-type: none"> Mandated in local content 45% Engine production project 	<ul style="list-style-type: none"> WTO → Move out local content policy 1st Product champion: 1 Ton pick up & derivative 	<ul style="list-style-type: none"> 2nd Product champion: ECO car 1 & 2 Excise tax base on CO₂ emission Ethanol & Bio diesel 	<ul style="list-style-type: none"> xEV and 4 major parts promotion (Battery, BMS, Motor, DCU) ZEV as of 30@30

Thailand's Vision on Electric Vehicle

"To be one of the most important EV production bases and component parts in 2035"

The National Electric Vehicle Policy Committee, March 2021

ZEV Cumulative volume target in 2030

(Zero Emission Vehicle (ZEV) = BEV & FCEV)

Vehicle type	Production	Use	Public Charging Station
Passenger cars & Pick-up trucks	2,935,000	2,050,000	12,000 (Fast charge)
Trucks & Buses	156,000	160,000	n.a.
Motorcycles	3,133,000	3,200,000	1,450 (1 Station = 8 outlet)

BEV Policy in Thailand

National EV Committee (EV Board)



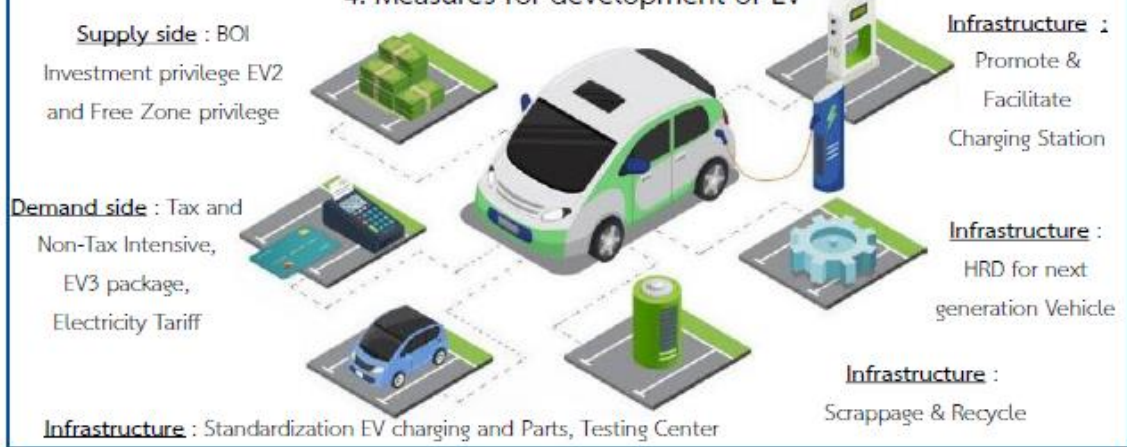
1. In 2020 PM. assign National EV Policy Committee. Deputy-PM., Mr. Supattanapong Punmeechaow as chairman that had arranged total 6 meeting since 2021. The EV committee had setting vision, target, Strategies and Measures as well as assigned 4 Sub-EV committees to implement policy.

2. EV target in 2025-2030

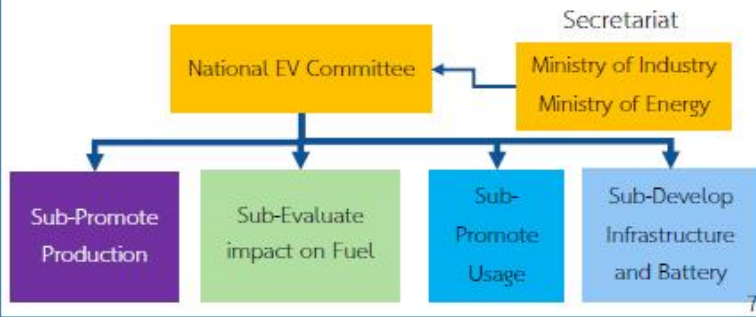
Target	Type	(unit/year)	
		2025	2030
Production	Car/Pick-up	225,000 (10%)	725,000 (30%)
	Motorcycle	360,000 (20%)	675,000 (30%)
	Bus/Truck	18,000 (33%)	34,000 (47%)
Infrastructure	Two-Wheel Charging Station	1,600	8,000
	Four-Wheel Fast Charging	2,200-4,000	12,000
	Battery for BEV production	20 GWh	56 GWh

- ZEV = BEV 100%

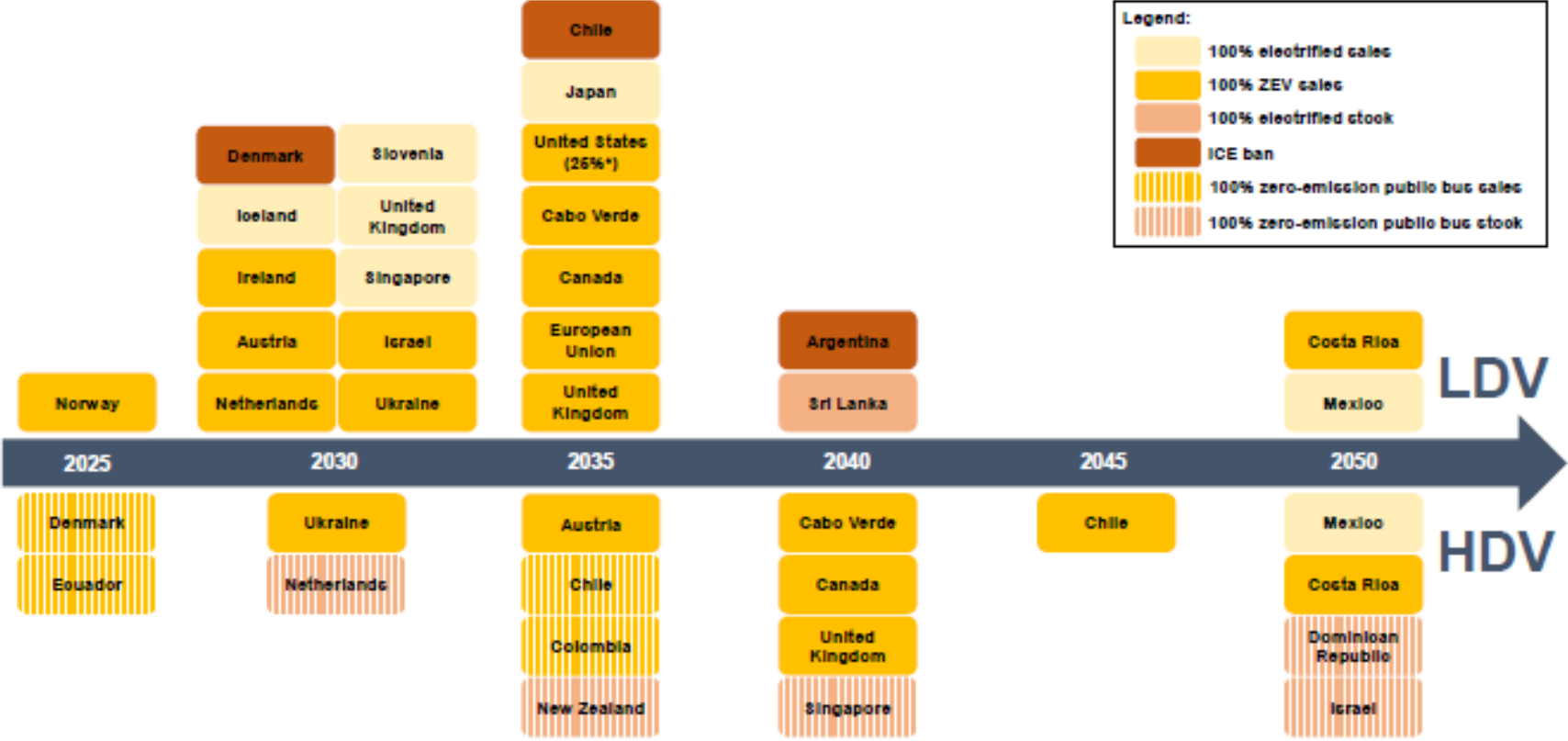
4. Measures for development of EV



3. Sub-EV committee



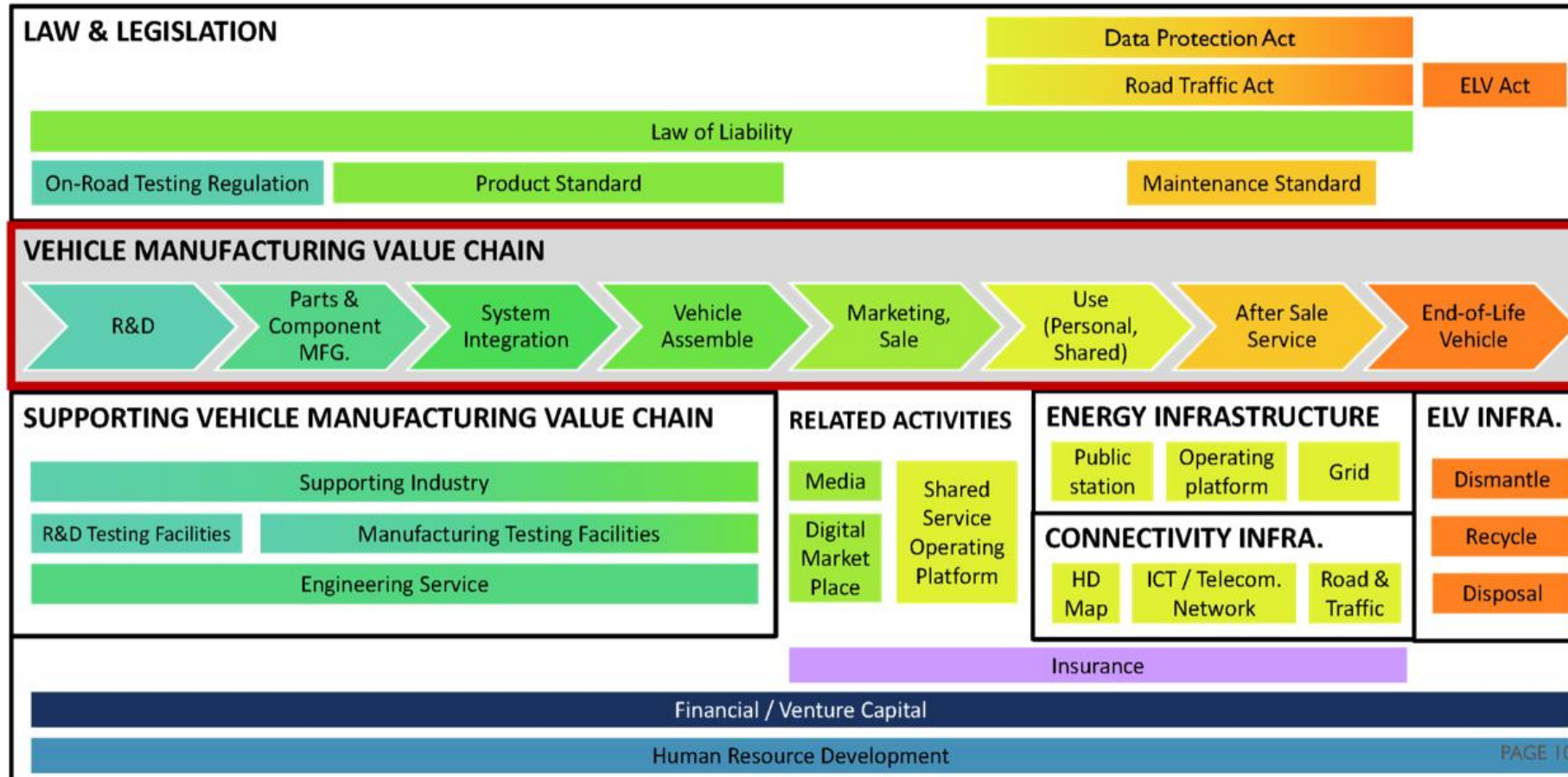
Global zero-emission vehicle mandates and internal combustion engine bans



IEA. CC BY 4.0.

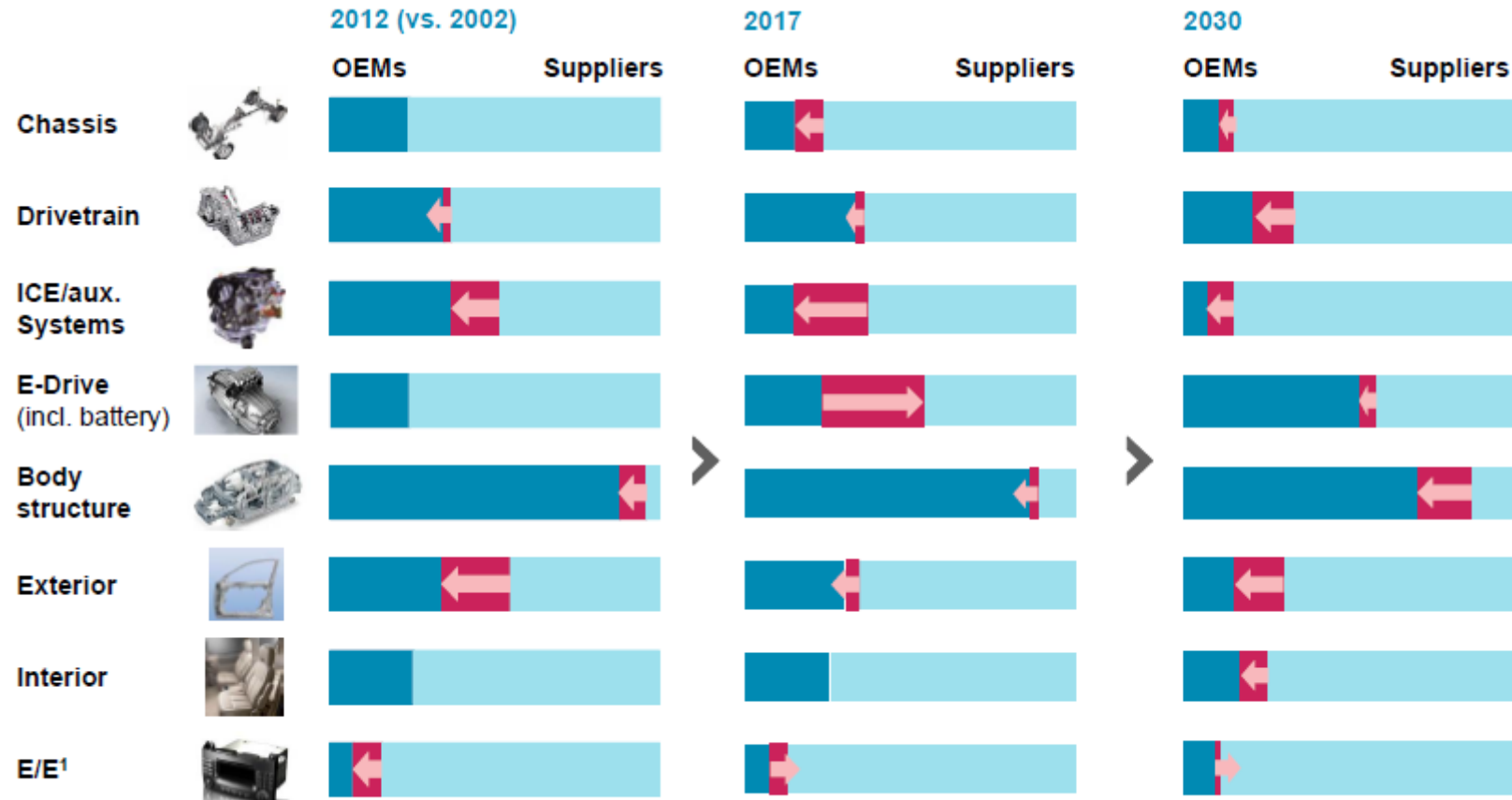
Next-Generation Automotive Ecosystem

Next-Generation Automotive Ecosystem



PAGE 10

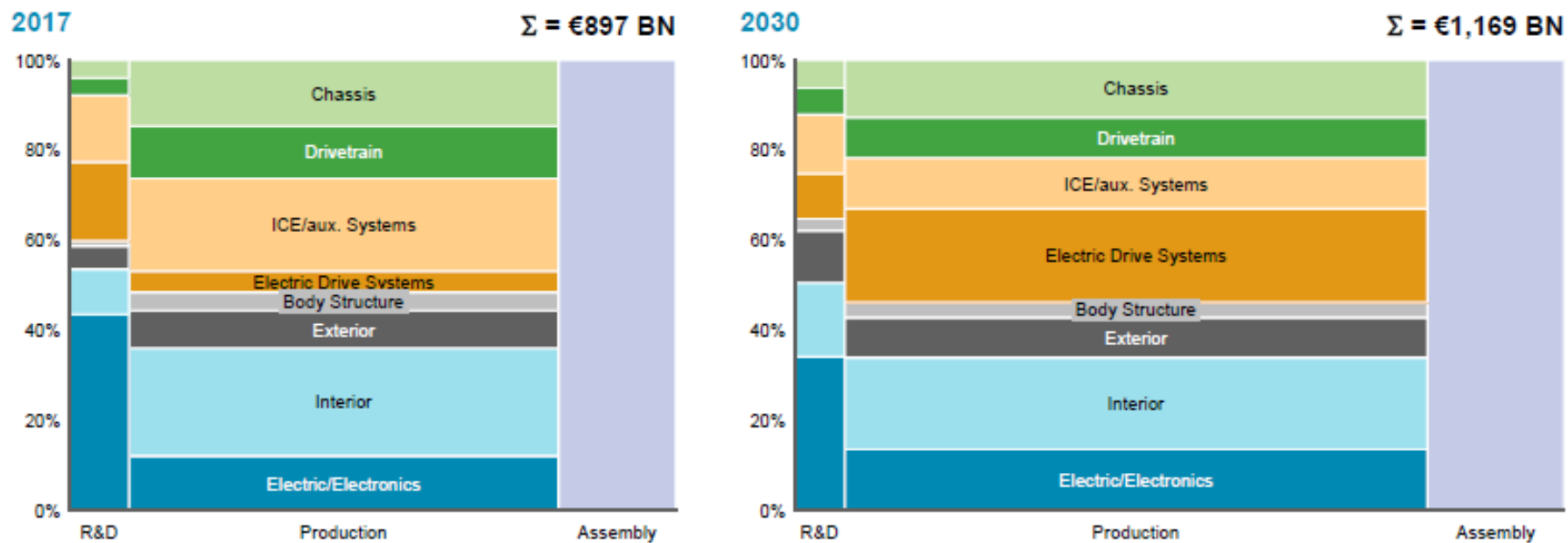
Vertical shifts in automotive value creation until 2030



1. Driven by advancement of ADAS and autonomous driving (AD)
Source: Oliver Wyman value creation model

Horizontal shifts in automotive value creation until 2030

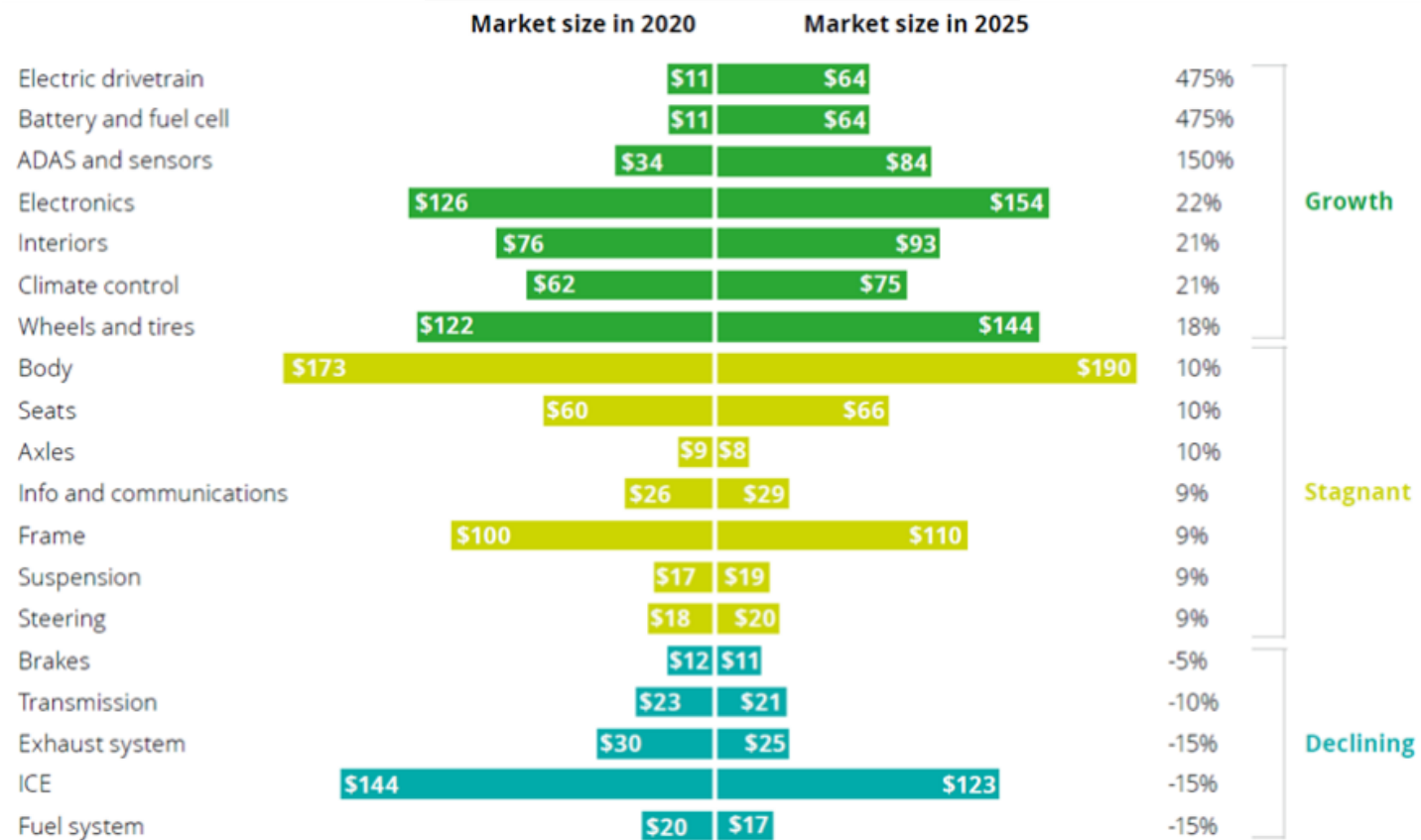
Development of value creation In % of total



Source: Oliver Wyman Analysis

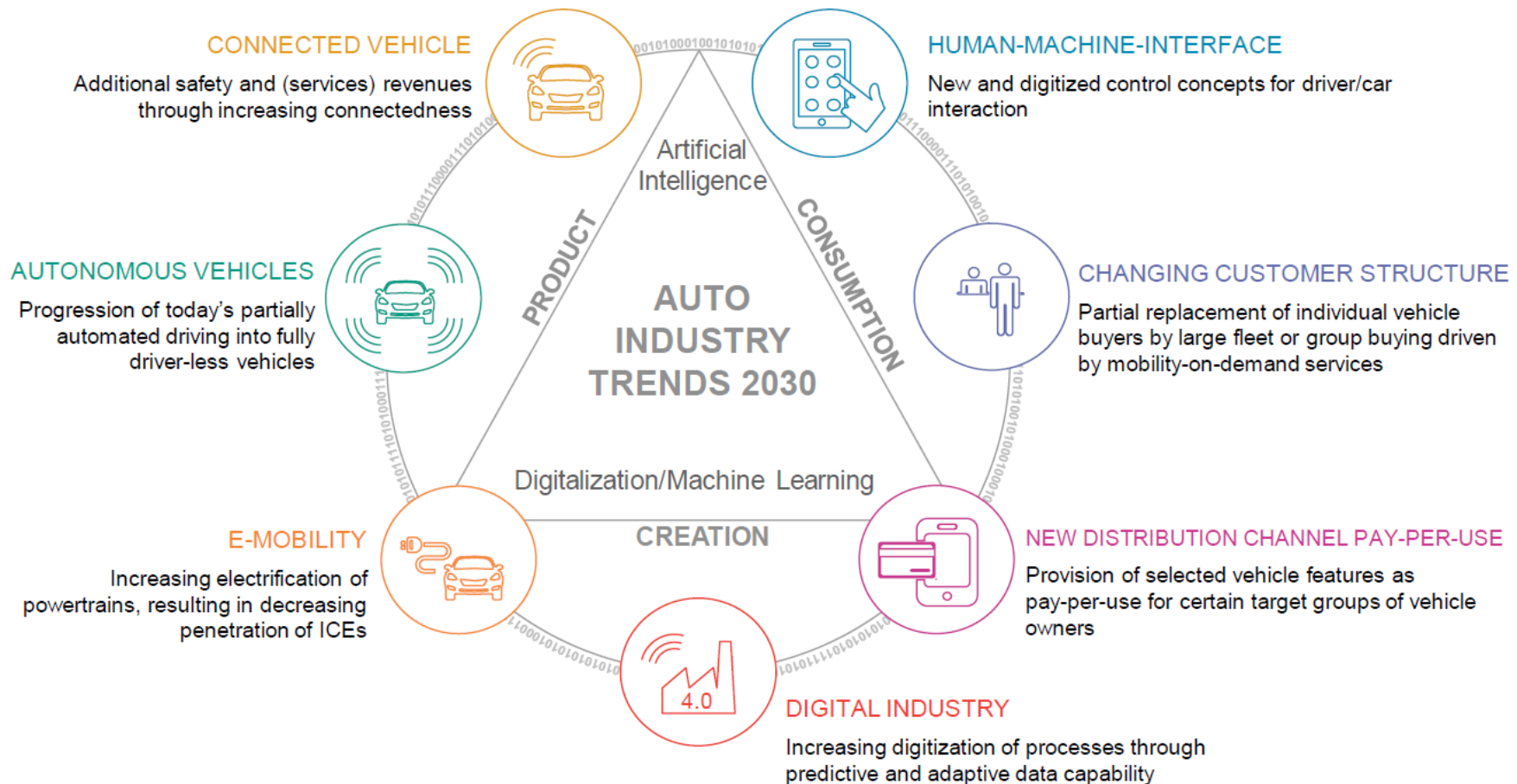
Auto part in next-generation automotive

Transition from ICE to BEV will affect the market size of the supply chain



Source: Deloitte (2020), Impact to Automotive Supply Chains in Thailand

Automotive industry trends until 2030



Thai Automotive Industry Structure

2014

18 Motor vehicle Assembler **8** Motorcycle Assembler



462 1st Tier Supplier



1,137 2nd & Lower Tier Supplier



Pure Foreign Foreign Majority Joint Venture Thai Majority Pure Thai

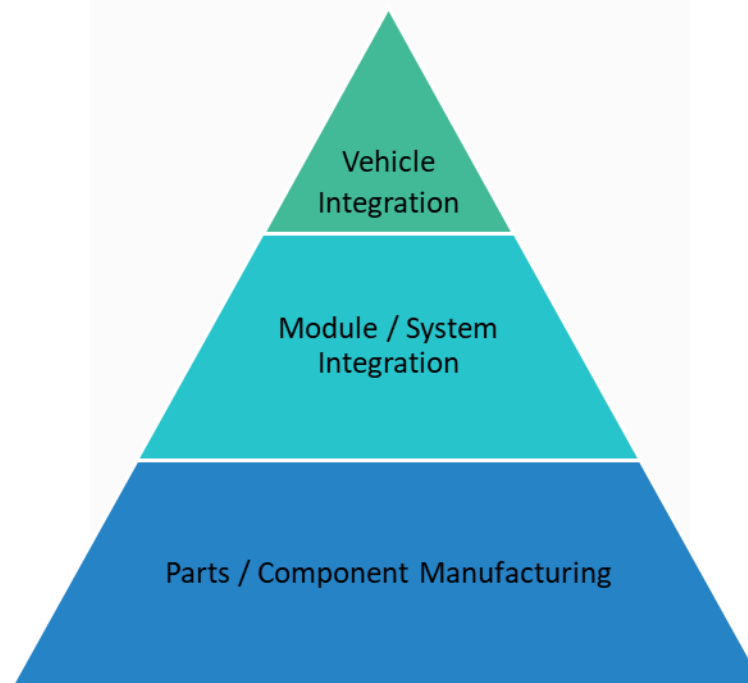


Production Capacity

4-wheel vehicle 2 million units / year



2-wheel motorcycle 2 million units / year

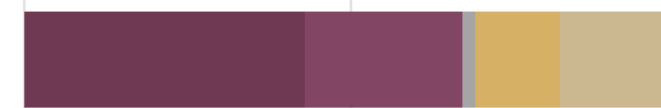


2022

28 Motor vehicle Assembler **12** Motorcycle Assembler



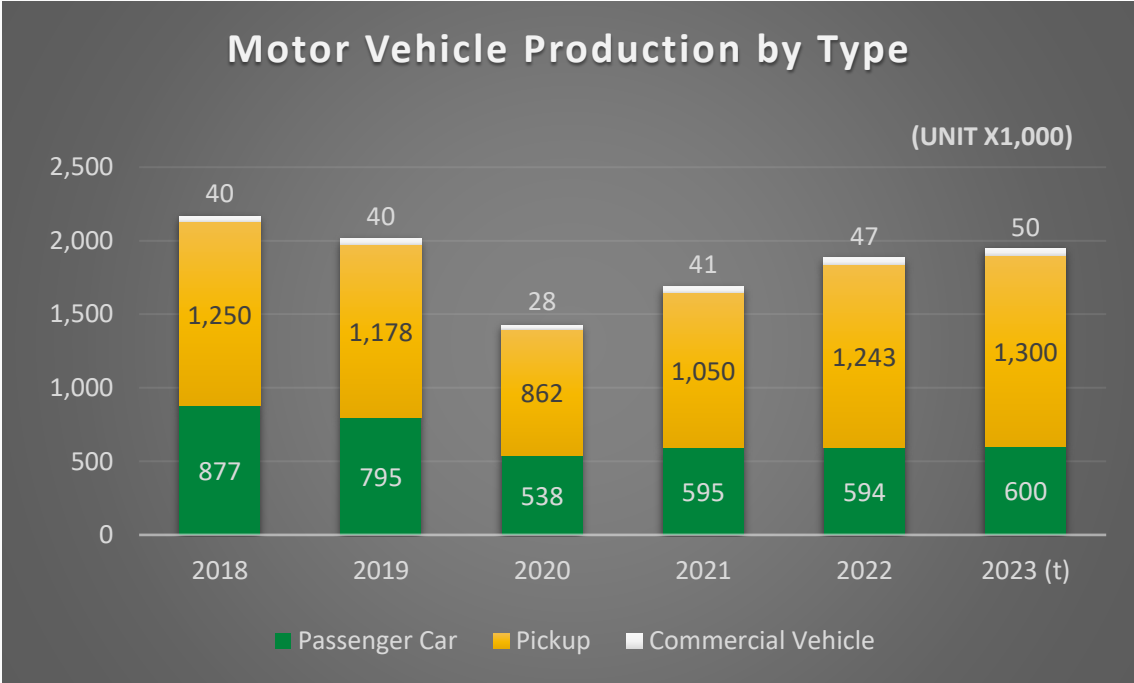
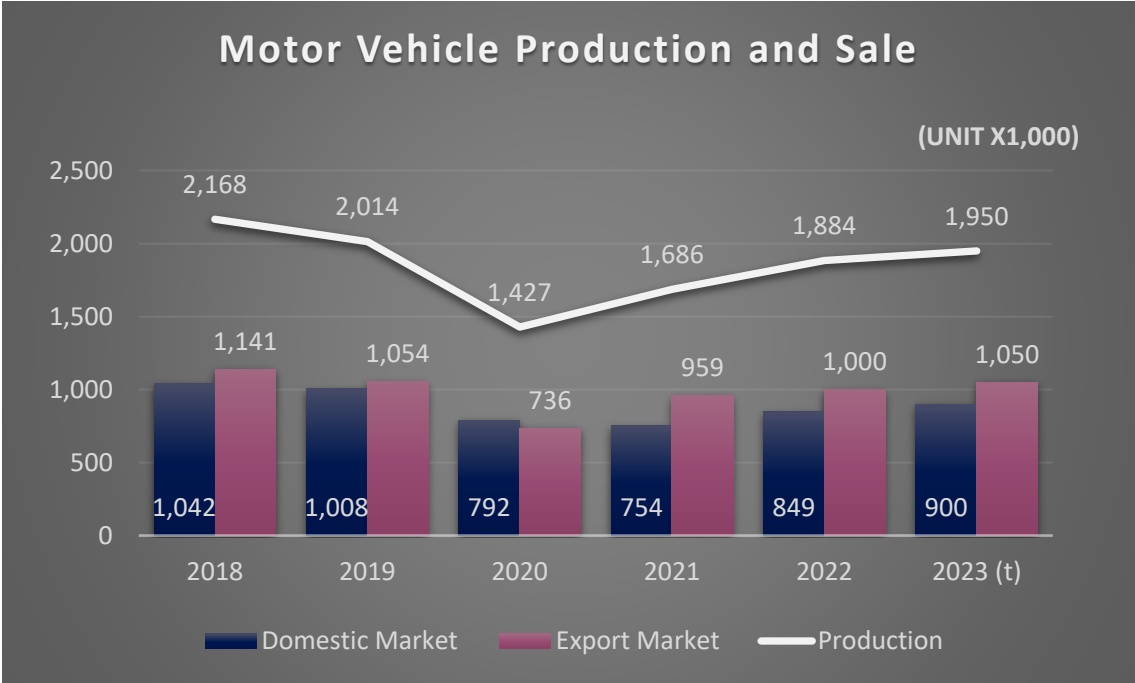
529 1st Tier Supplier



1,756 2nd & Lower Tier Supplier



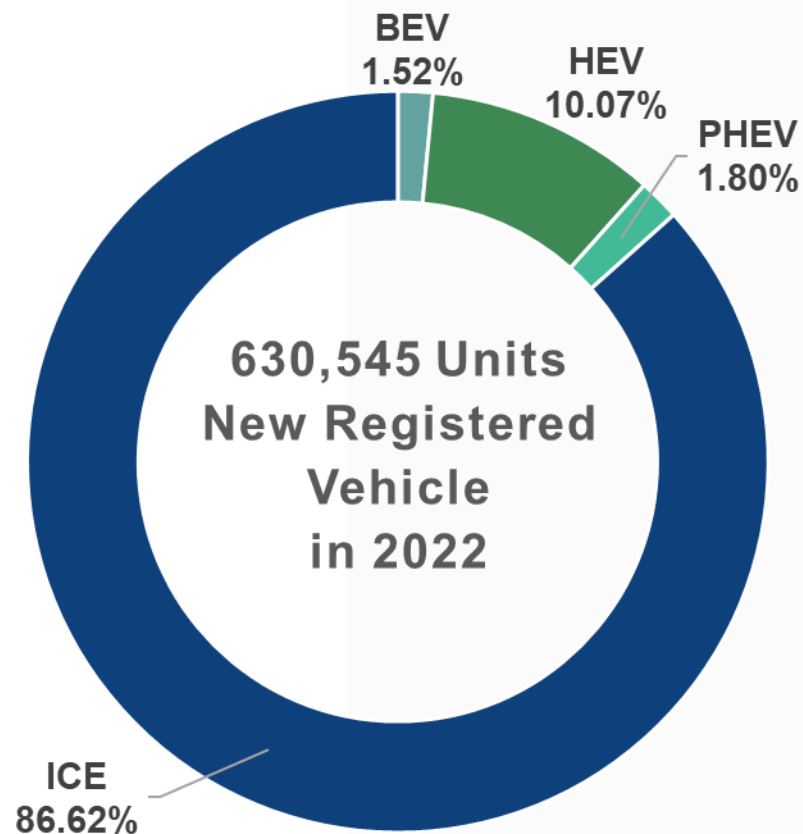
Motor Vehicle Production



- In 2022, Thailand's car production totaled 1.88 million, 0.84 million cars were assembled for domestic market and 1 million for export. Total car production is forecast at 1.95 million in 2023, up 3.5% from 2022.
- Pickups represented 62% of total car production in Thailand, while passenger cars shared 35% and other commercial vehicles (trucks, vans and buses) 2%. The country's BEV production was still small.

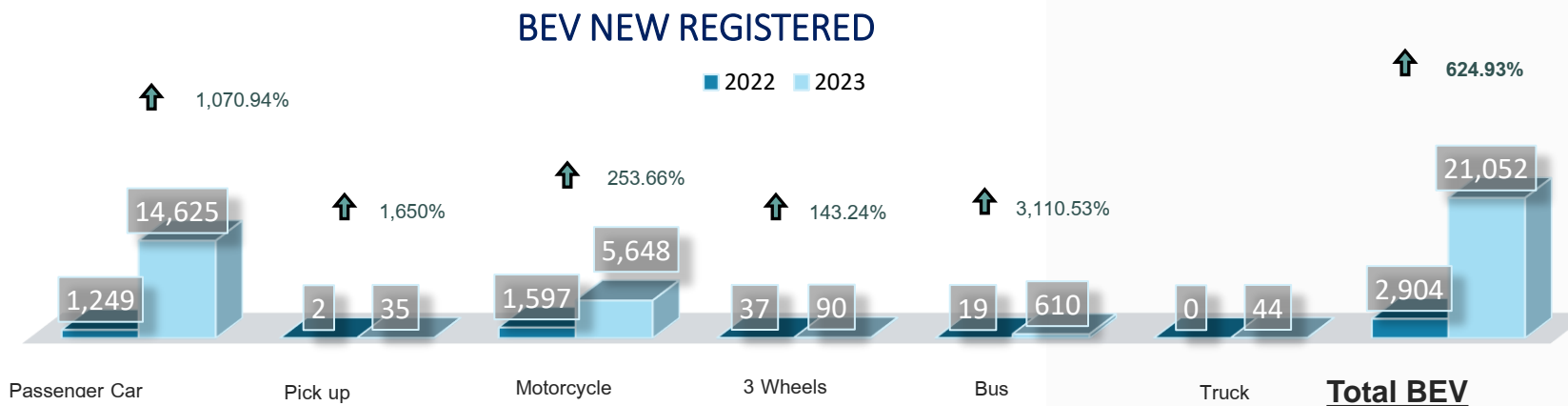
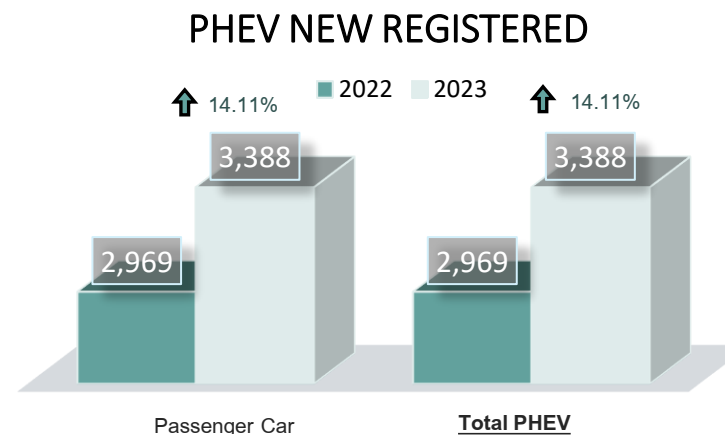
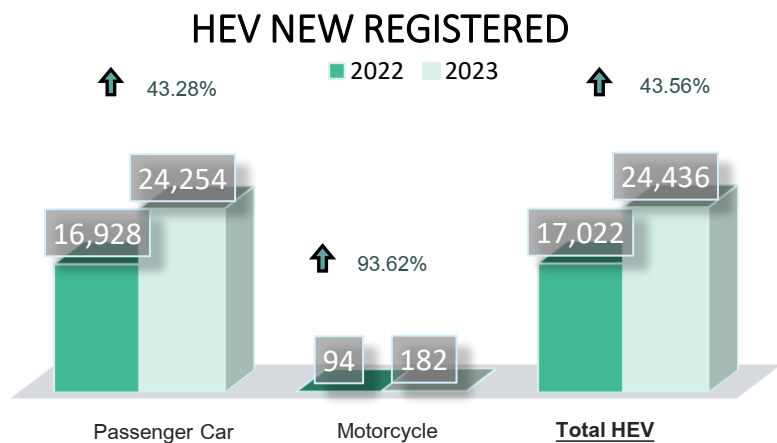
Registration of Passenger Vehicles not exceeding 7 seats in 2022

■ BEV	9,584 units
■ HEV	63,470 units
■ PHEV	11,330 units
■ ICE	546,161 units



Source : APEC AD37, presented by OIE

xEV Registration in Thailand, Year to Date (Jan – Mar 2023)



Source: Department of Land Transport, Ministry of Transport Thailand:

Topics >>>

3. Conclusion



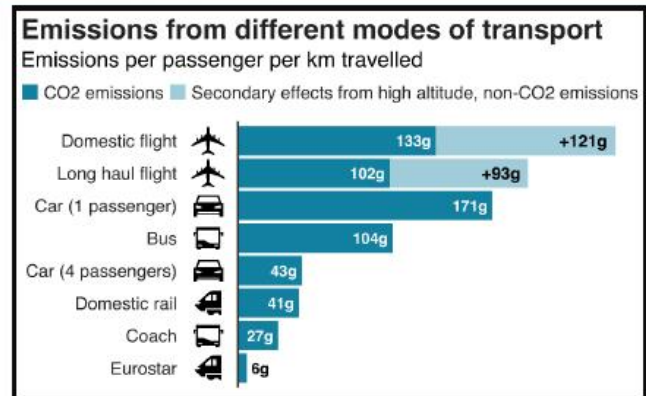
Global CO₂ Emission from Land Transport and Global greenhouse gas emission

Based on global transport emissions in 2018, which totaled 8 billion tonnes CO₂ Transport accounts for 24% of CO₂ emissions from energy.

74.5% of transport emissions come from road vehicles



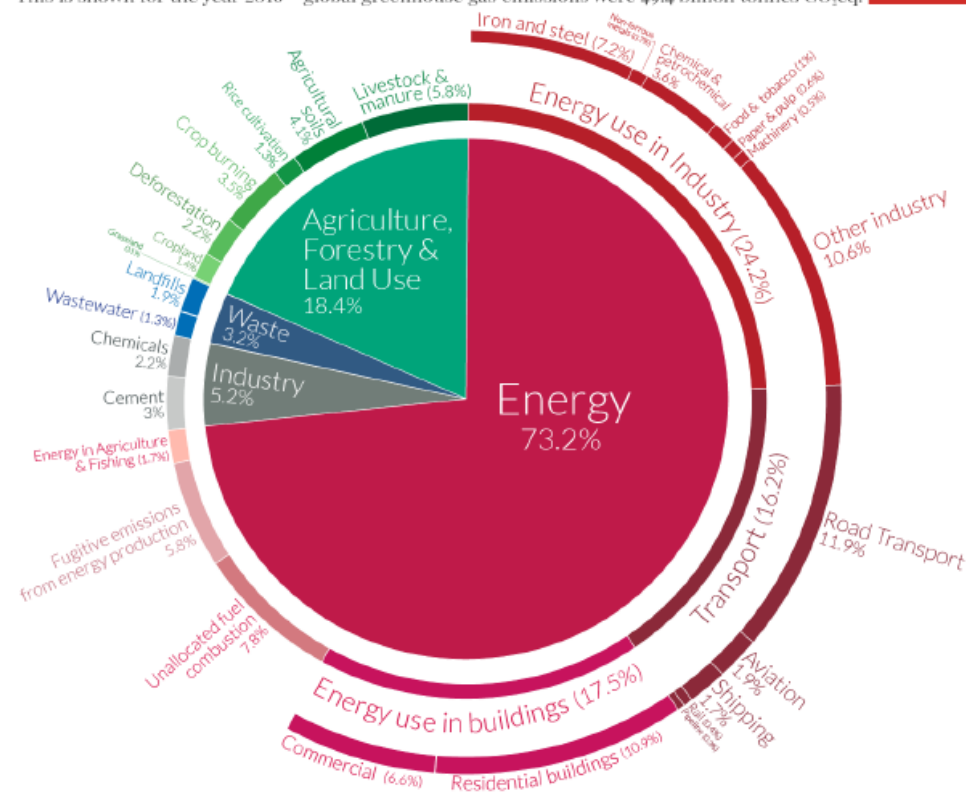
Of passenger emissions: 60% from international; 40% from domestic flights



Note: Car refers to average diesel car
Source: BEIS/Defra Greenhouse Gas Conversion Factors 2019

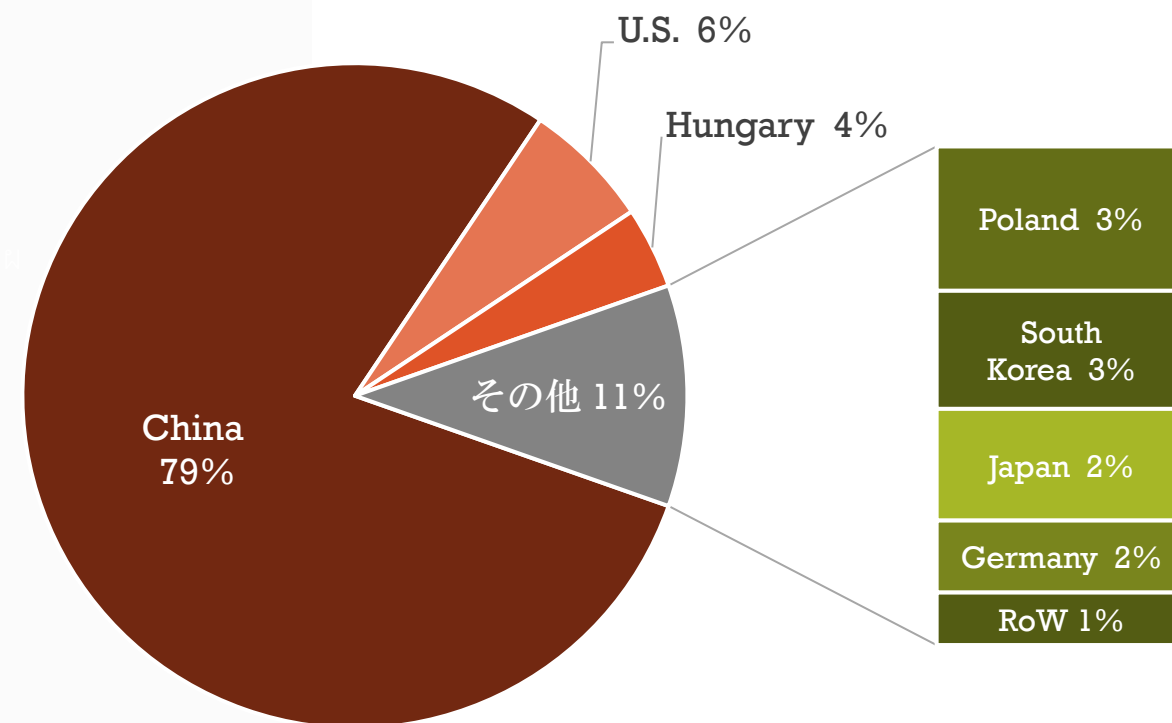
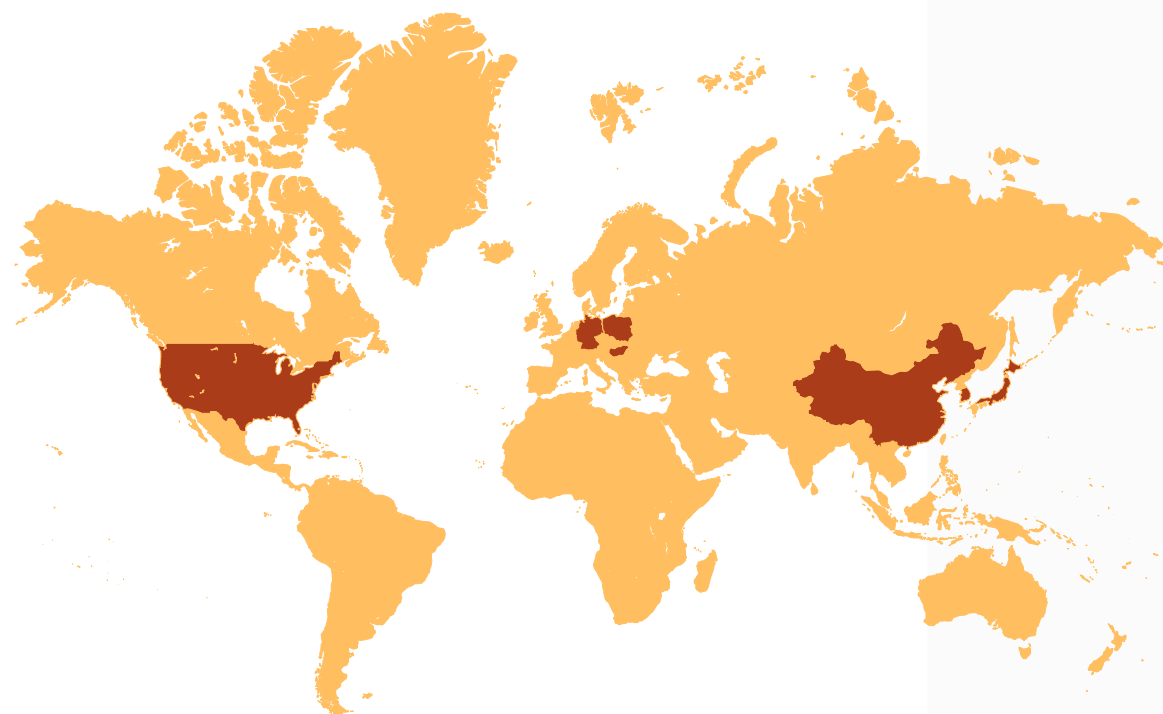
Global greenhouse gas emissions by sector

This is shown for the year 2016 – global greenhouse gas emissions were 49.4 billion tonnes CO₂eq.



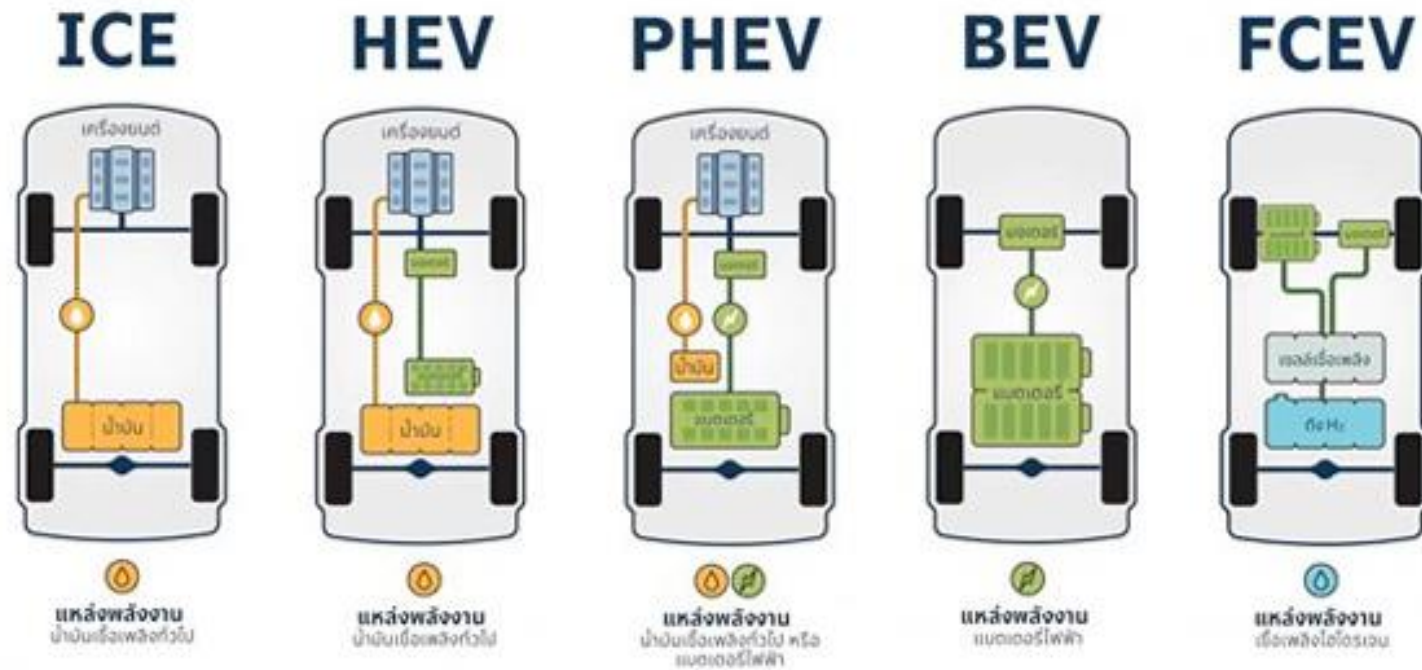
OurWorldinData.org – Research and data to make progress against the world's largest problems.
Source: Climate Watch, the World Resources Institute (2020). Licensed under CC-BY by the author Hannah Ritchie (2020).

EV Battery Manufacturing Capacity, by Country



Source of Energy for Electric vehicle

- How to manage energy resources to green 100%
- Even Electricity still need fossil from well to wheel for PHEV, BEC, FCEL



Fossil

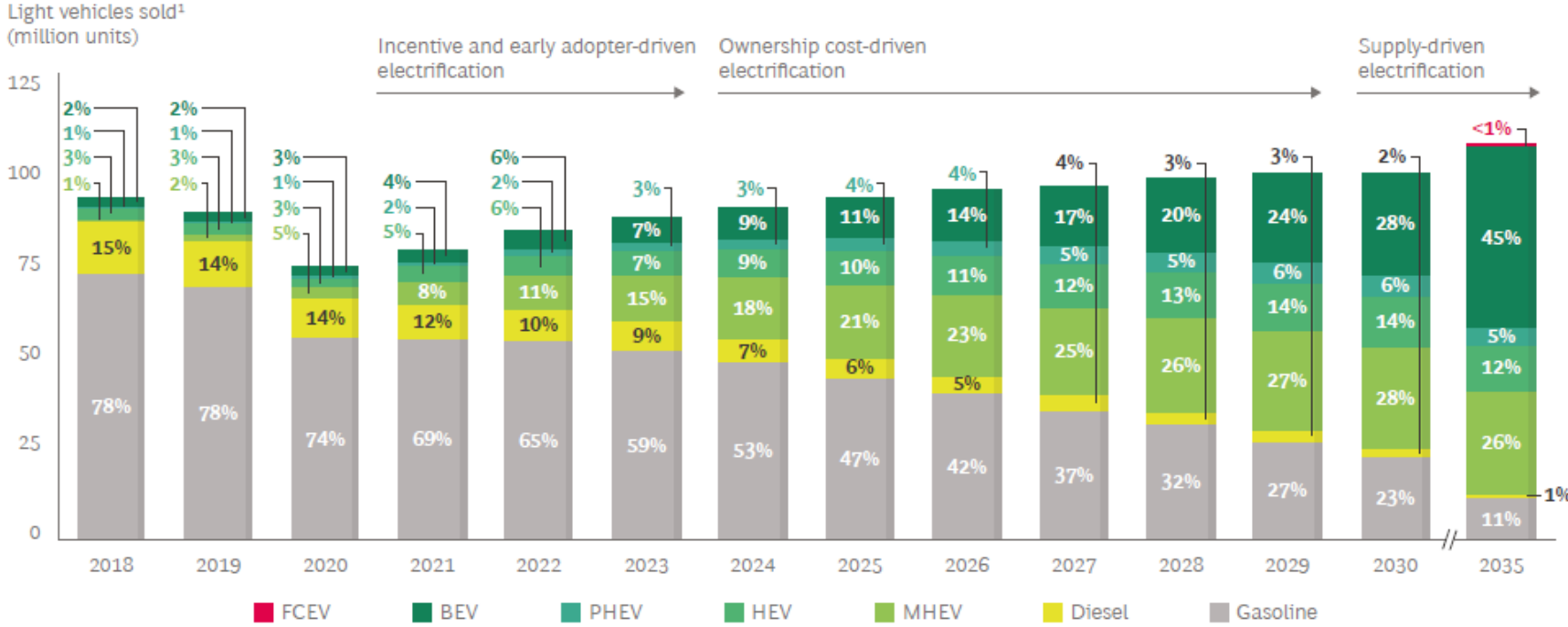
Electric

Fuel cell

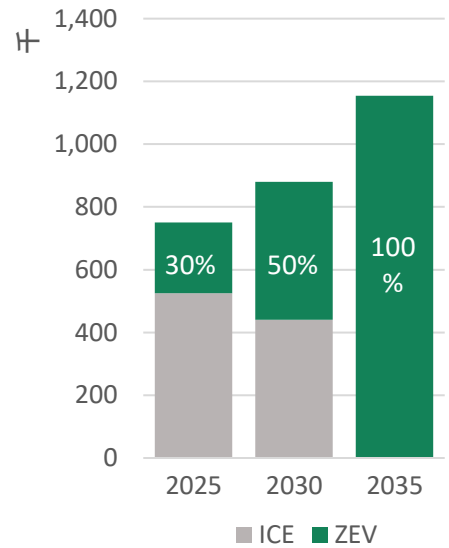
Hydrogen

Global Electric Vehicle Forecast by 2030

Global market share of light vehicles by power train²



Target of ZEV market in Thailand



Source: Boston Consulting Group (April 2021), Why Electric Cars Can't Come Fast Enough

Note: FCEV=fuel-cell electric, BEV=battery electric, PHEV=plug-in hybrid electric, HEV=full hybrid electric, MHEV=mild hybrid electric. Because of rounding, the percentage total for a particular year may not equal 100%.

¹Sales for 2018, 2019, and 2020 are actual data. Data for 2021 onward are BCG projections.

²Forecast includes cars, SUVs, and all other light passenger vehicles except heavy-duty vans.

Source: Thailand National Electric Vehicle Policy Committee (March 2021)

BEV's Battery manufacturing in Thailand by auto makers

Activities related to battery production

Battery cell production



Beta Energy Solution



Energy Absolute



Global Power Synergy



EVlomo

Battery packing



Honda Automobile
(HEV)



Toyota Motor (HEV)



Nissan Powertrain
supply for Nissan Motor
(HEV)



Thonburi Energy Storage
supply for Mercedes-Benz
(PHEV)



DTS Draexlmaier supply for
BMW Manufacturing (PHEV)



MMTH Engine supply for
Mitsubishi Motor (PHEV)



SAIC Motor-CP (PHEV)



Energy Absolute (BEV)

- The BEV's battery manufacturing will rely on imported cells or modules. Then come to Thailand to pack because of the tax advantages. And the majority of them are owned or controlled by automakers or their subsidiaries.
- A battery cell manufacturing facility usually produces a battery for energy storage that can't be supplied to the automotive manufacturers in the country.

Progress of Next-Generation Vehicle Investment in Thailand

BOI Approval for Next-Generation Vehicle's Project : from 2017 to 2022

	HEV	PHEV	BEV	Grand Total
Projects Approval	7 Projects	8 Projects	15 Projects	30 Projects
Investment (Million Baht)	38,623.9	11,665.6	27,745.2	80,208.60
Production capacity (Units)	440,955	137,600	256,220	838,775
Company (Car maker)	GWM, Honda, Mazda, MG, Mitsubishi, Nissan, Toyota	BMW, BYD, GWM, Mercedes Benz, Mazda, MG, Mitsubishi, Toyota	BYD, FOMM, GWM, Honda, Horizon, Mazda, Mercedes Benz, MG, Mine, Mobility, Mitsubishi, Nissan, Skywell, Takano, Toyota	

Privileges: Import duty reduction, Excise tax reduction or Exemption and subsidy for EV import during 2022-2023 and production during 2022-2025 as of following:-

- ❖ **Passenger Car** with price less than 2 million baht
 - ✓ Reduction of import duty maximum 40% for BEV CBU Cars.
 - ✓ Reduction of excise tax from 8% to 2%
 - ✓ Subsidy 70,000 baht/Unit for BEV with 10-30 kWh battery and 150,000 baht/Unit for BEV with more than 30 kWh battery
- ❖ **Passenger Car** with price 2-7 million baht
 - ✓ Reduction of import duty maximum 20% for BEV CBU
 - ✓ Reduction of excise tax from 8% to 2%
- ❖ **Pickup**
 - ✓ Exemption of excise tax
 - ✓ Subsidy 150,000 baht/Unit for BEV pick-ups with more than 30 kWh battery
- ❖ **Motorcycles**
 - ✓ Reduction of excise tax to 1%
 - ✓ Subsidy 18,000 baht/Unit for BEV motorcycle with price less than 150,000 baht

Total car makers signed MOU with Excise Department for EV3 Packages

	EV Car	EV Motorcycle	Total
The company joined the EV3 package	9 Companies	3 Companies	12 Companies
Volume	35,322 Units	4,400 Units	39,722 Units

(Source : Excise Department as of 31 January 2023)

Strength of Thailand for Automotive Investment

- **Regional Geographic to be Hub of ASEAN**
- **# 10 of the World Production Base**
- **Multinational Production Base with strong Supplier Base and Value Chain**
- **Clear Vision and Supportive Measure for Next General Vehicle Investment : Demand, Supply and Infrastructure**
- **30 Projects – BOI Approval for HEV, PHEV and BEV**
- **12 Companies has joined EV3 Package for EV Productions**





Thank you



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