



Thai Automotive Industry

Facts and Figures 2021

1. 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) |

2. Thailand EV Promotion Measures



SUPPLY SIDE

- Set an EV and charger standard
- Establish a testing facility; ATTRIC
- Supply chain transition program
- End-of-Life Vehicle (ELV) program
- Investment promotion scheme



DEMAND SIDE

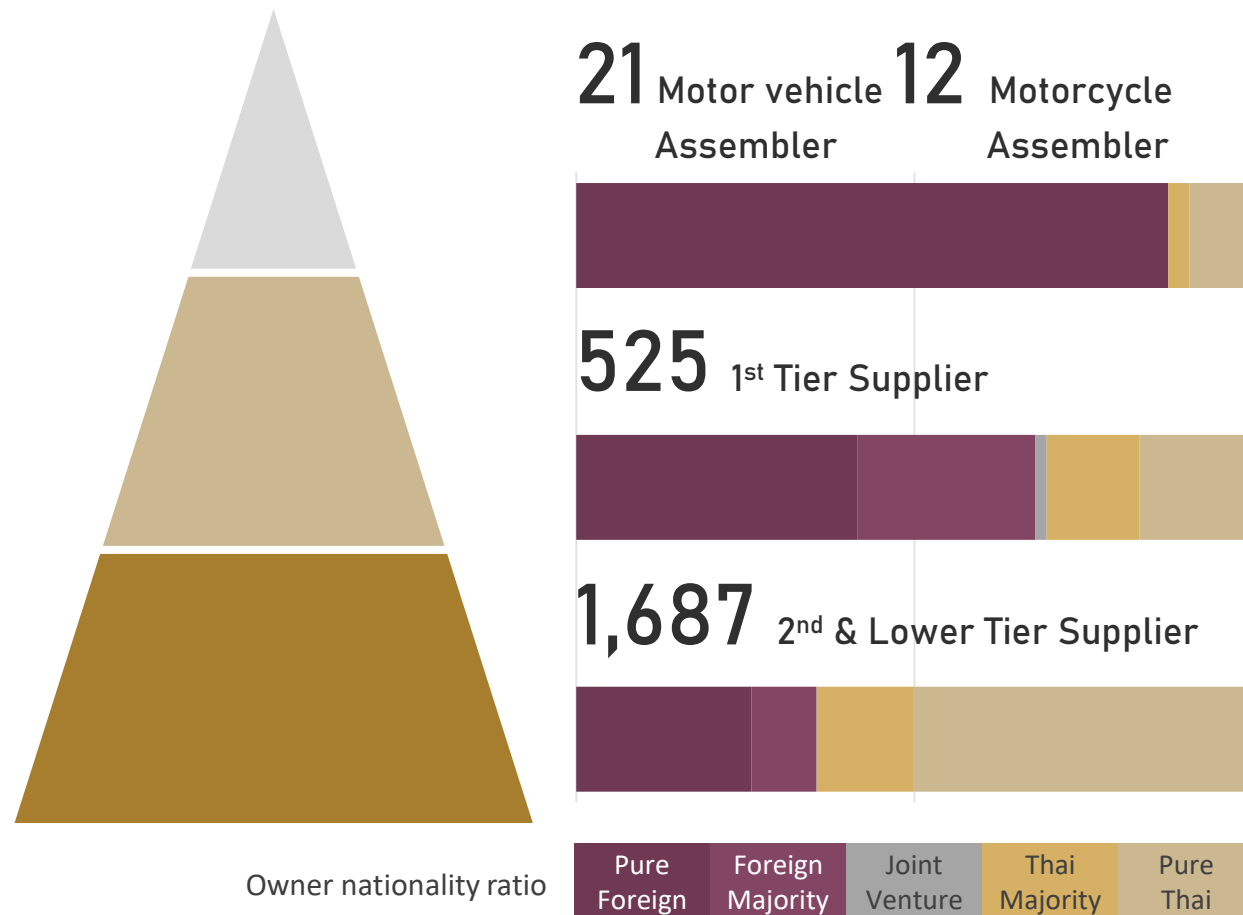
*** Under Consideration Promotion Scheme ***



INFRASTRUCTURE

- Install a public charging station

3. Structure of Thai Automotive Industry



- The Thai automotive industry is structured in a pyramid form, with car manufacturers at the top and automotive parts manufacturers below, sorted by auto parts deliveries.
- In 2021, Thailand will have 21 motor vehicle and 12 motorcycle assembler, with foreign operators owning more than 90% of the companies.
- There are 525 first-tier suppliers, with foreign operators owning approximately 65% of them.
- There are 1,687 second and lower-tier suppliers, with Thai operators owning approximately 70% of them.



4. Motor Vehicle

4.1 Motor Vehicle Assembler in Thailand

| No. | COMPANY NAME | Passenger Car | | Pick up |
|-----|---|---------------|-----|---------|
| | | ICE | BEV | |
| 1 | Auto Alliance (Thailand) Co., Ltd. (Mazda) | ● | ○ | ● |
| 2 | BMW Manufacturing (Thailand) Co., Ltd. | ● | | |
| 3 | Ford Motor Company (Thailand) Ltd. | | | ● |
| 4 | FOMM (Aisa) Co., Ltd. | | ● | |
| 5 | Great Wall Motor Manufacturing (Thailand) Co., Ltd. | ● | ○ | |
| 6 | Honda Automobile (Thailand) Co., Ltd. | ● | ○ | |
| 7 | Isuzu Motor Thailand Co., Ltd. | | | ● |
| 8 | Mercedes-Benz Manufacturing (Thailand) Co., Ltd | ● | ○ | |
| 9 | Mitsubishi Motors (Thailand) Co., Ltd. | ● | | ● |
| 10 | Nissan Motor (Thailand) Co., Ltd. | ● | ○ | ● |
| 11 | SAIC MOTOR - CP CO.,LTD. | ● | ○ | ● |
| 12 | Suzuki Motor (Thailand) Co., Ltd. | ● | | |
| 13 | Takano Auto Thailand Co., Ltd. | | ● | |
| 14 | Tan Chong Subaru Automotive (Thailand) Co., Ltd. | ● | | |
| 15 | Toyota Motor Thailand Co., Ltd. | ● | ○ | ● |

| No. | COMPANY NAME | Van | Bus & Truck | |
|-----|---|-----|-------------|-----|
| | | | ICE | BEV |
| 16 | Foton CP Motor Co., Ltd. | | ● | |
| 17 | Hino Motors Manufacturing (Thailand) Ltd. | | ● | |
| - | Isuzu Motor Thailand Co., Ltd. | | ● | |
| 18 | Energy Absolute Co., Ltd. | | | ● |
| 19 | Scania Manufacturing (Thailand) Co., Ltd | | ● | |
| 20 | Thai-Swedish Assembly Co., Ltd. | | ● | |
| 21 | Toyota Auto Works Company Limited | ● | | |

NOTE:: ● Start of operation ○ BOI Approve BEV project

Three automobile manufacturers have begun to produce BEVs:

1. FOMM (Asia) manufactures small passenger cars.
2. Takano Auto (Thailand) manufactures small pickup vehicles.
3. Mine Mobility manufactures buses.

Other manufacturers have given approval BOI is getting ready to go into production.

4.2 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)



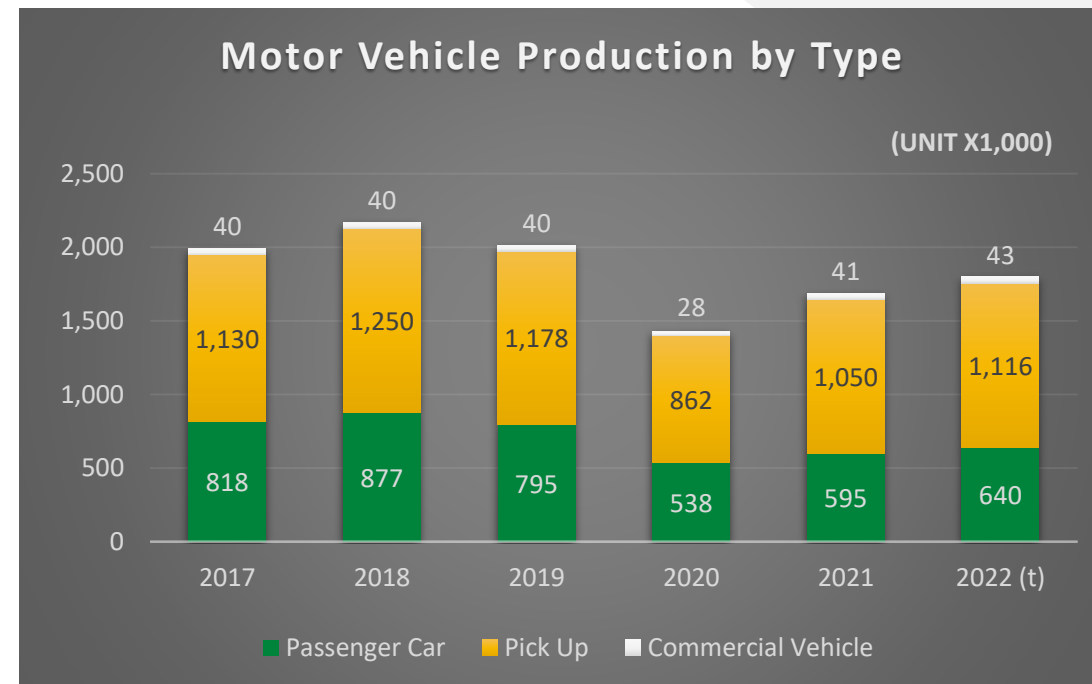
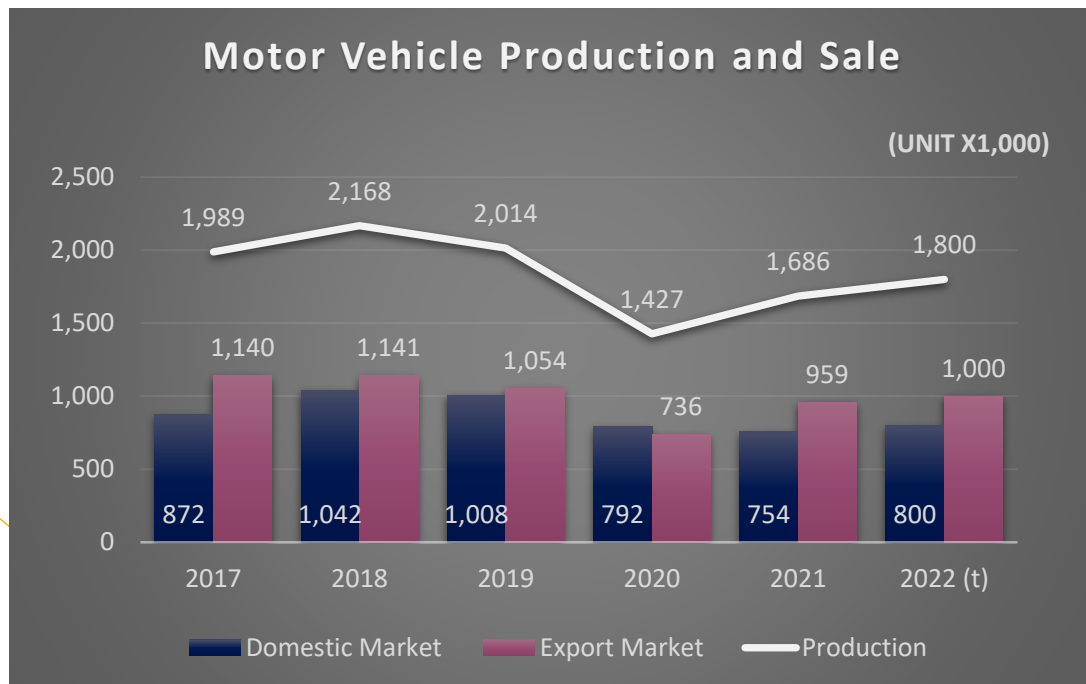
SAIC Motor-CP (PHEV)



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.

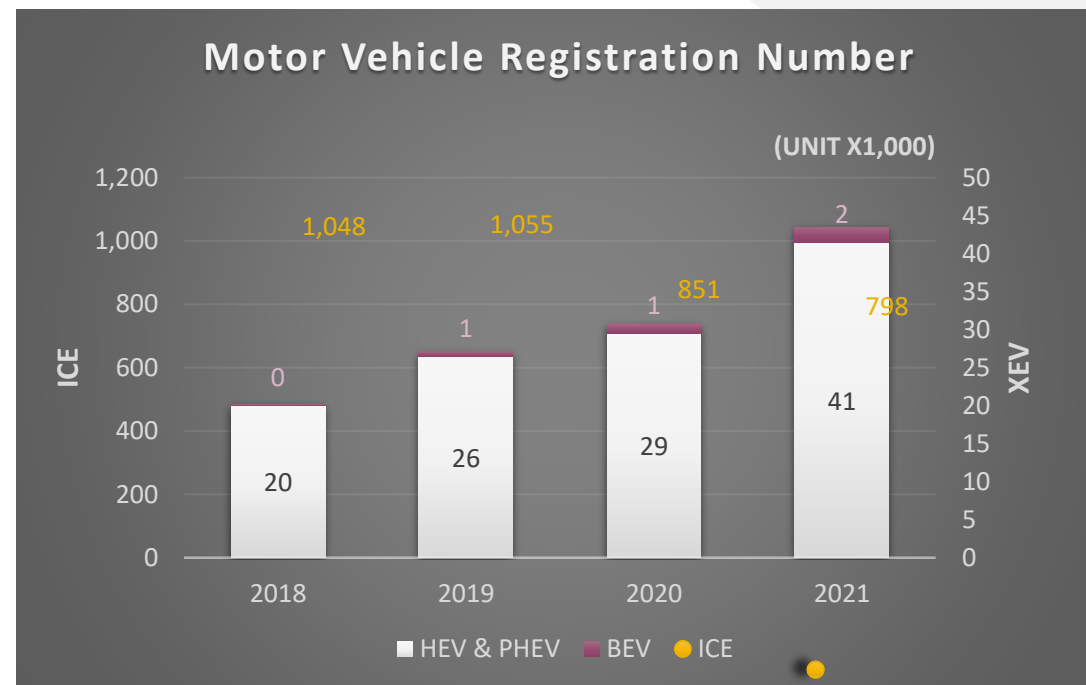
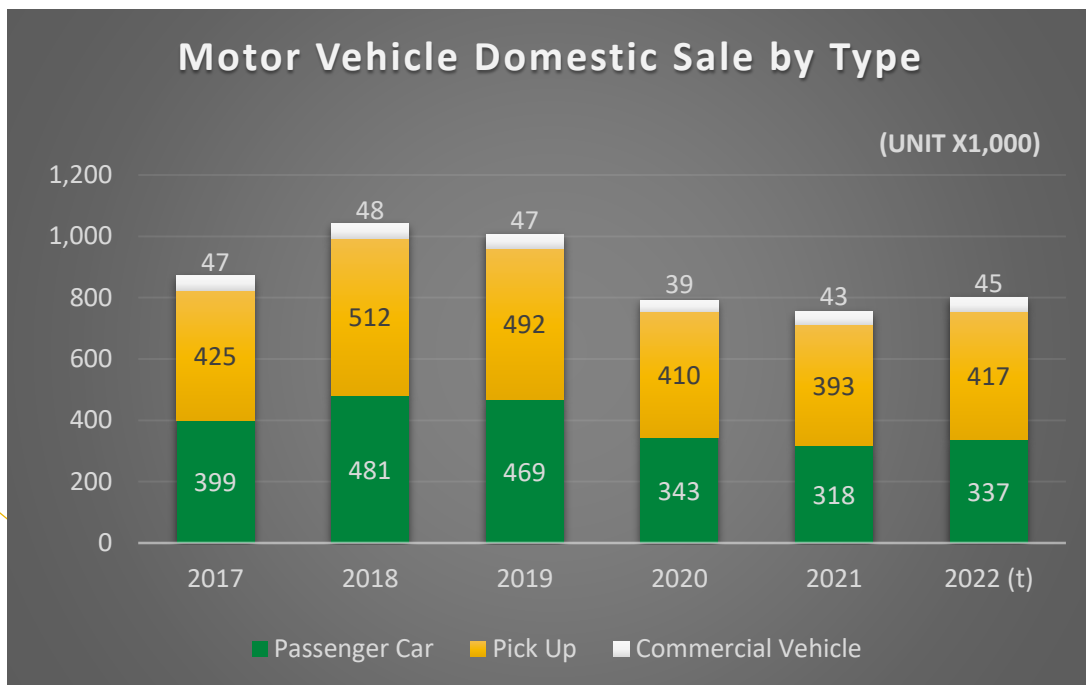
4.3 Motor Vehicle Production



- In 2021, Thailand produce 1.68 million motors vehicle, divided into 0.75 million for domestic sales and 0.96 million for export, and 1.80 million cars in 2022, an increase of 6.8% from 2021.
- A pickup truck accounts for roughly 60% of production, a passenger car for 38%, and other commercial vehicles for the remaining 20% (trucks, vans and buses). The country's BEV production is still quite small.

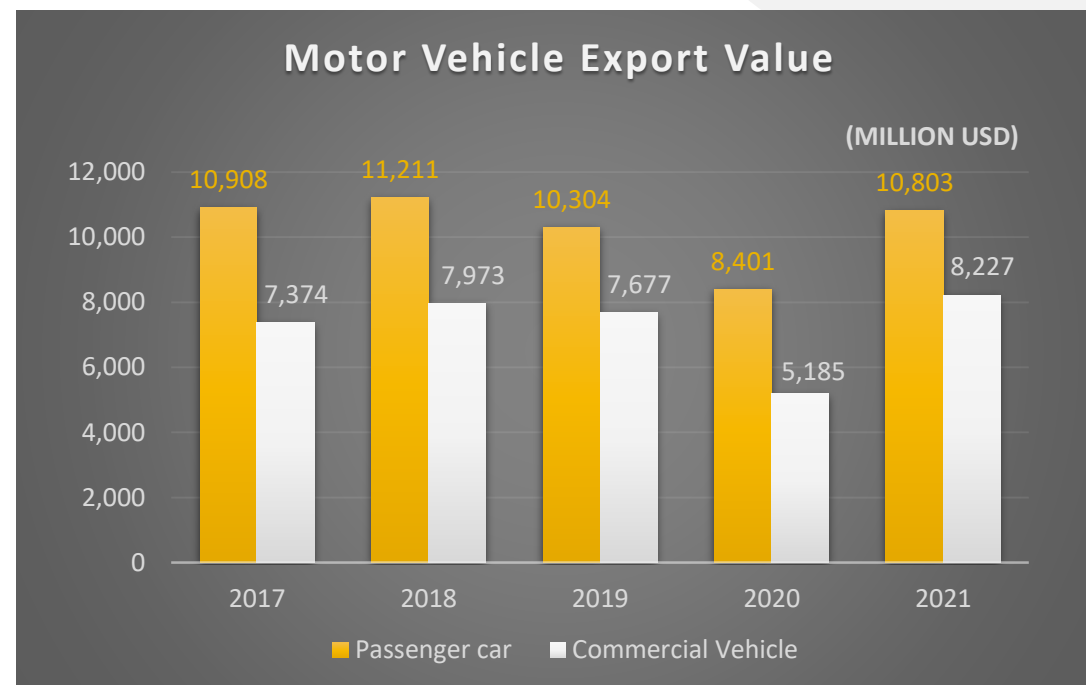
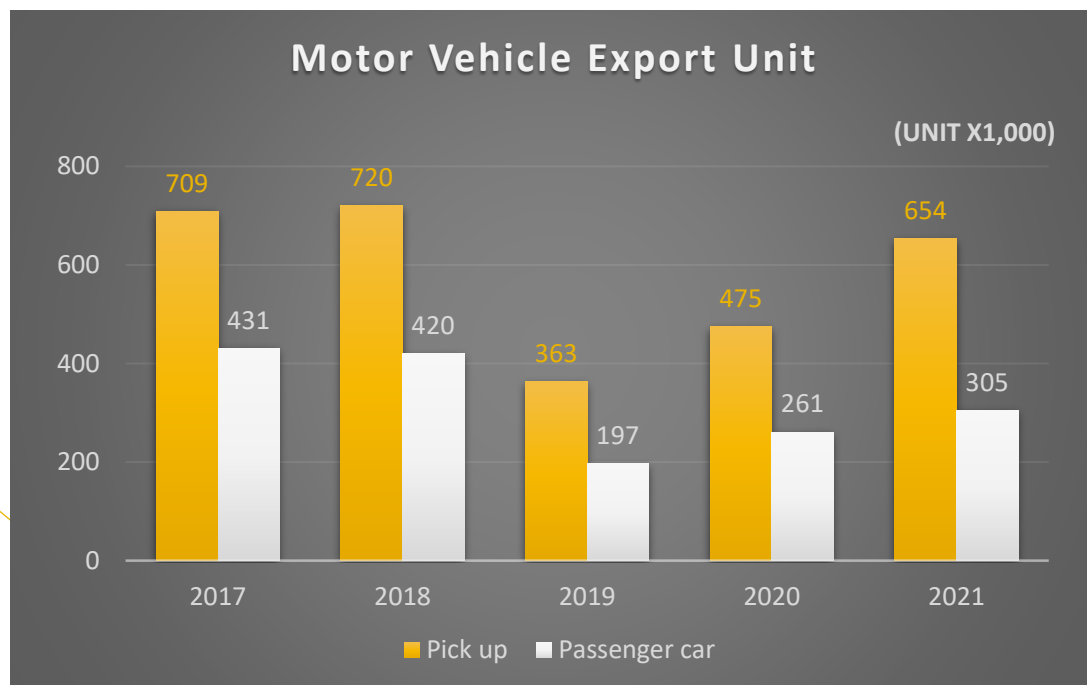
Note: Data source from Automotive Industry Club, The Federation Of Thai Industries
(t) = Targeted by Automotive Industry Club, The Federation Of Thai Industries

4.4 Motor Vehicle Domestic Sale



- Thailand's domestic car sales would total 0.75 million in 2021, down 5% from 2020. In 2022, a total of 0.80 million cars are expected. A pickup truck accounts for around 52 percent of domestic sales, followed by a passenger car (42%), and other commercial vehicles (6%). (trucks, vans and buses).
- The number of BEV car registrations has continued to rise, with a 61% increase in 2021, while ICE car registrations will fall by 6%. Almost all BEV domestic sales are imported from abroad, with China being the most popular form. Despite the fact that the number of registered BEV cars has increased dramatically. However, when compared to the total number of registered vehicles, this is still a small percentage (less than 1%).

4.5 Motor Vehicle Export



- Thailand will export 0.96 million motor vehicles in 2021, up 30% from last year. A total of 1.00 million motor vehicle are predicted to be sold in 2022.
- Around 68 percent of exports are pickup trucks, while 32 percent are passenger cars. In terms of export value, passenger cars make up 57% of all motor vehicle exports.

Note: Data source from Automotive Industry Club, The Federation Of Thai Industries
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5. Motorcycle

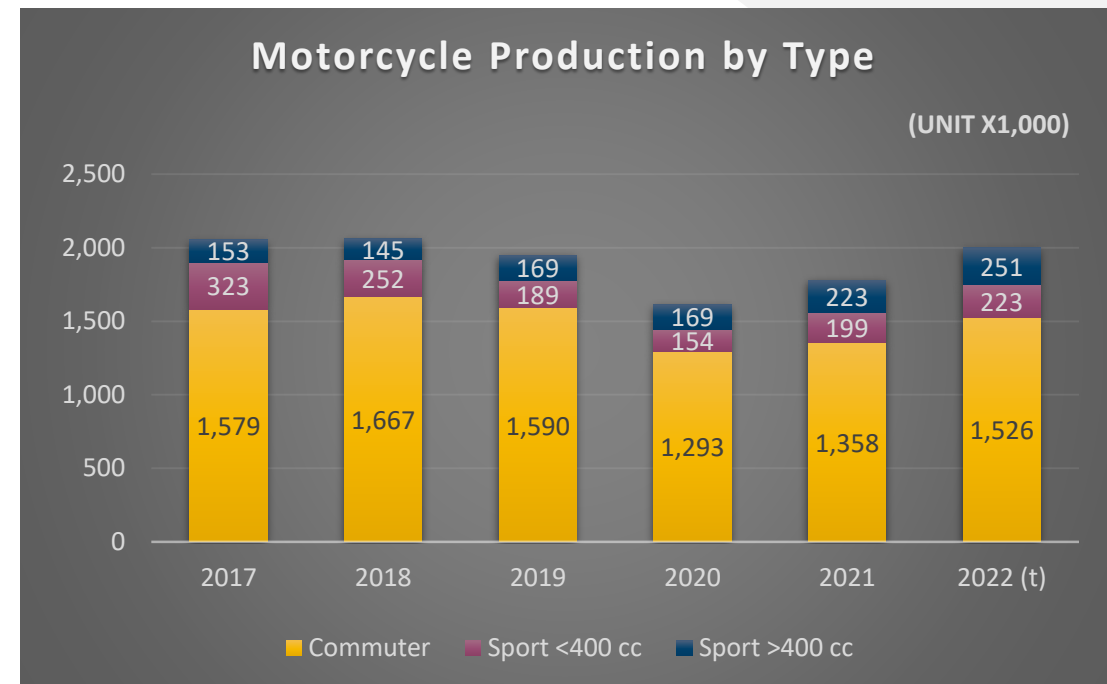
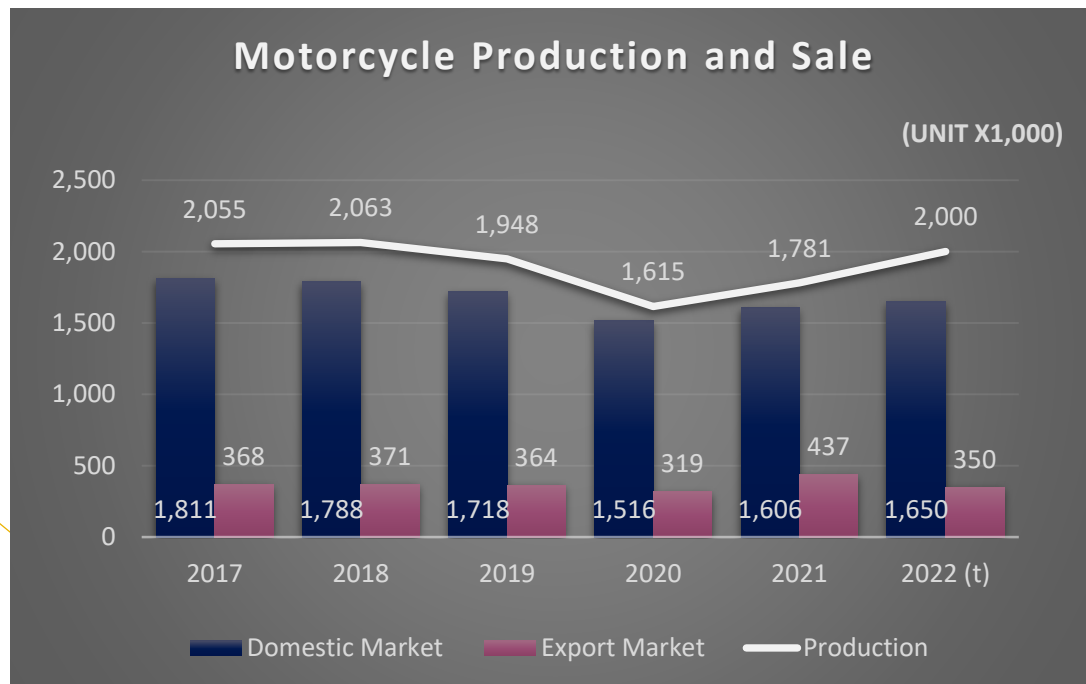
5.1 Motorcycle Assembler in Thailand

| No. | COMPANY NAME | ICE | BEV |
|-----|---|-----|-----|
| 1 | BMW Manufacturing (Thailand) Co., Ltd. | ● | |
| 2 | Deco Green Energy Co., Ltd. | | ● |
| 3 | Ducati Motor (Thailand) Co., Ltd. | ● | |
| 4 | Etran (Thailand) Company Limited. | | ● |
| 5 | GP Motor (Thailand) Co., Ltd. | ● | |
| 6 | Harley-Davidson (Thailand) Co., Ltd. | ● | |
| 7 | Kawasaki Motors Enterprise (Thailand) Co., Ltd. | ● | |
| 8 | Power Stalian Co., Ltd. | ● | ● |
| 9 | Thai Honda Manufacturing Co., Ltd. | ● | |
| 10 | Thai Suzuki Motor Co., Ltd. | ● | |
| 11 | Thai Yamaha Motor Co., Ltd. | ● | |
| 12 | Triumph Motorcycles (Thailand) Ltd. | ● | |



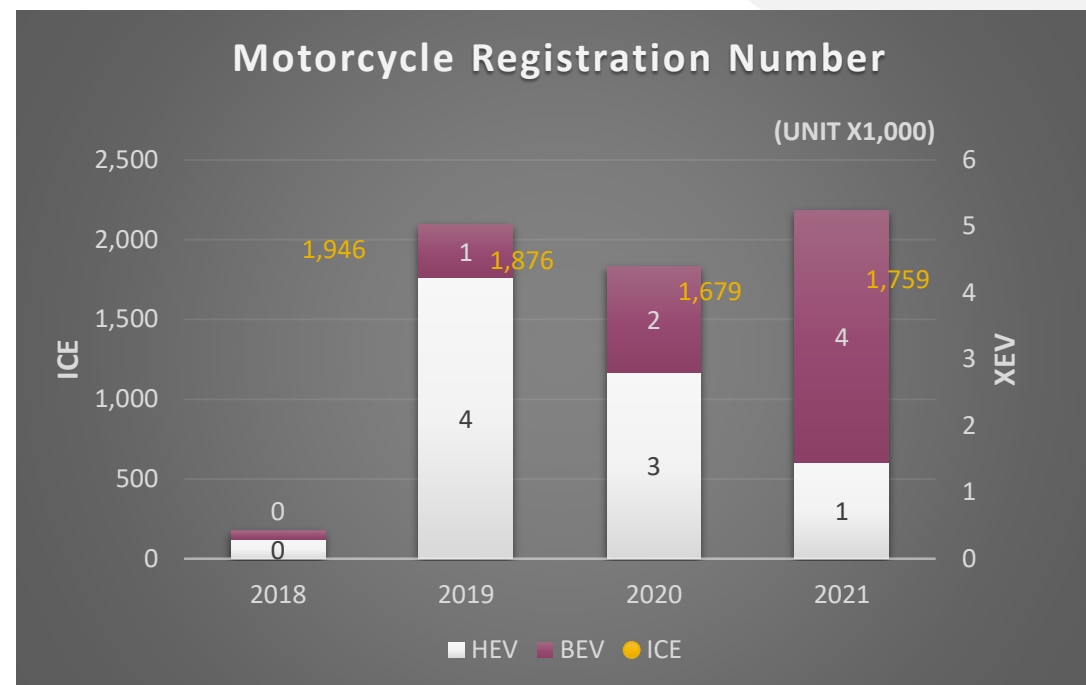
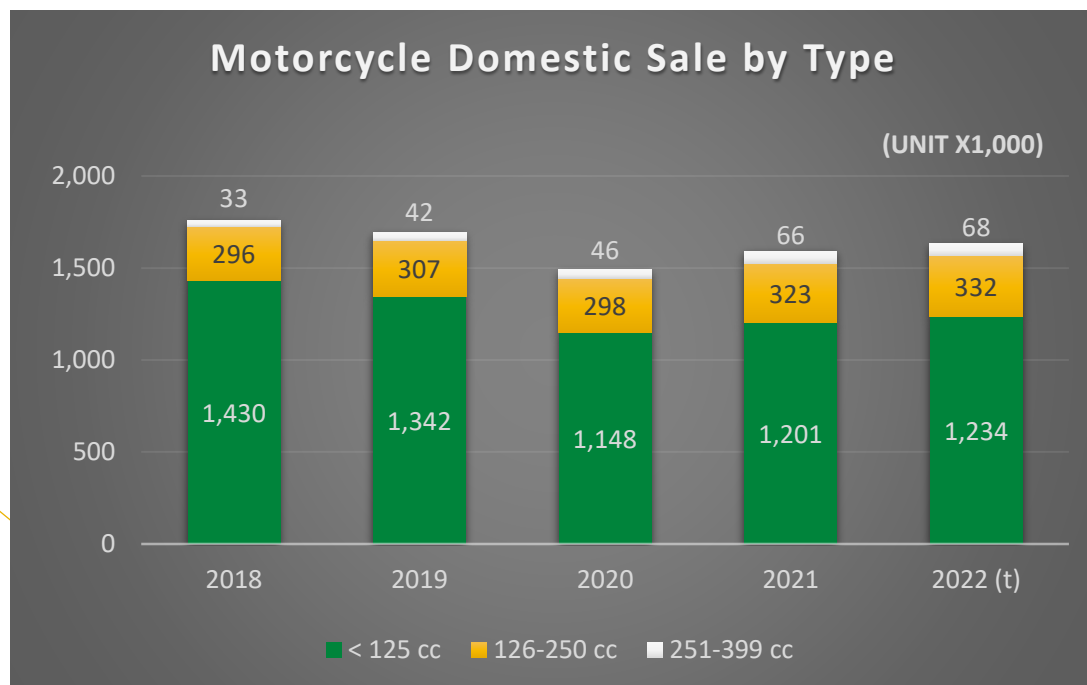
- BEV, a motorcycle manufacturer, is a newer entrant in the market, which is currently dominated by ICE vehicles.

5.2 Motorcycle Production



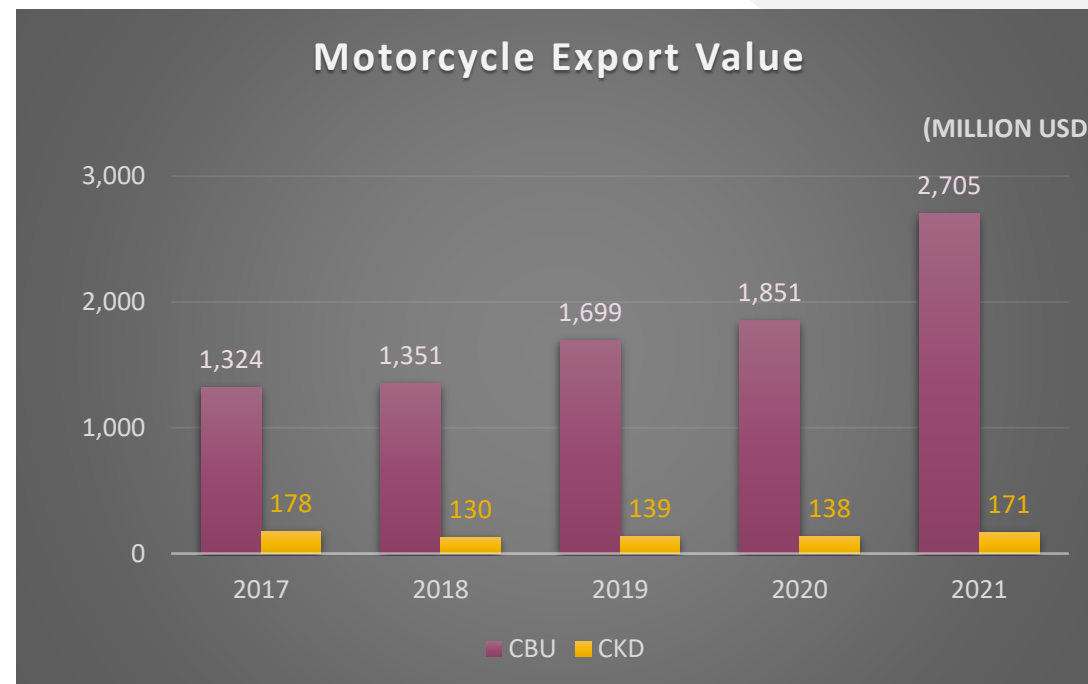
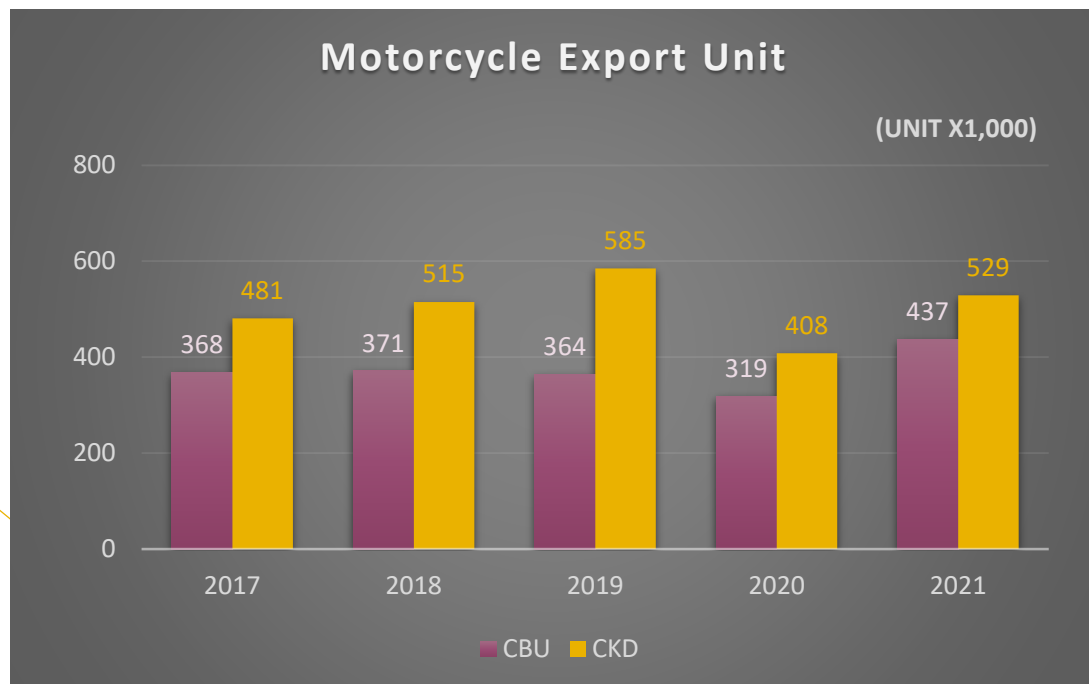
- In 2021, Thailand produce 1.78 million motorcycles, divided into 1.60 million for domestic sales and 0.43 million for export and 2.00 million cars in 2022, an increase of 12% from 2021.
- Commuters account for 78% of manufacturing, Sport 400cc accounts for 11%, and Sport>400cc accounts for 13%. The country's BEV production is still quite small.

5.3 Motor Vehicle Domestic Sale



- Thailand's domestic motorcycle sales will reach 1.60 million in 2021, increasing 6% from 2020. In 2022, 1.65 million motorcycles are predicted to be sold. Motorcycles with a displacement of less than 125 cc account for around 75% of domestic sales.
- In 2021, BEV motorcycle registrations are on the rise, with a 137 percent from 2020, compared to 5 percent for ICE motorcycles. BEV, a motorcycle manufacturer, is a newer entrant in the market, which is currently dominated by ICE vehicles.

5.4 Motorcycle Export

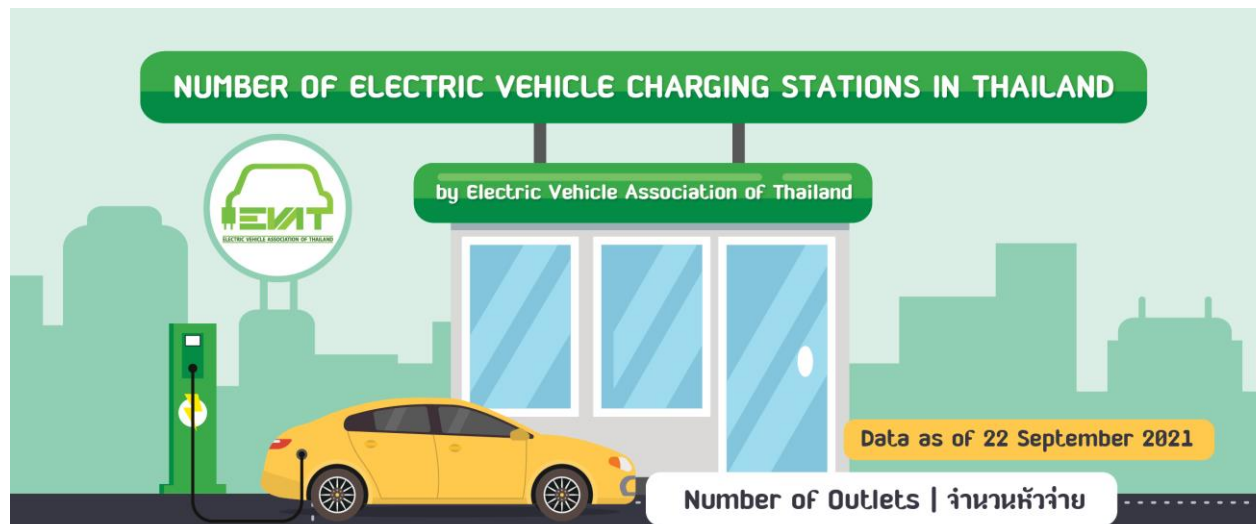


- Thailand will export 0.43 million CBU and 0.53 million CKD in 2021, up 37% and 30%, respectively, from the previous year.
- CBUs account for 94% of all motorcycle exports in terms of value. The reason is that a CBU export will be a high-value big bike, while CKD exports, on the other hand, will be small bikes with lower value.



6. Infrastructure for Next-Generation Vehicle

6.1 Public Charging Station



- Charging Plug & Socket : TISI Standard no. 2749
 - Passenger car: AC Charging = CCS 2
 - Bus: AC and DC Charging = CCS 2
- 1,511 AC chargers and 774 DC chargers were installed.
- Electricity price for EV charging station was declared, 2.6 THB/kWh.

| Service Providers ผู้ให้บริการ | Number of Locations จำนวนแห่ง | AC | DC | All |
|-----------------------------------|----------------------------------|-----------------|---------------|----------------|
| | | Normal Chargers | Fast Chargers | Total Chargers |
| ANYWHERE | 417 | 1,062 | 571 | 1,633 |
| CHARGING STATION | 68 | 48 | 32 | 80 |
| evolt | 49 | 79 | 23 | 102 |
| ChargeNow | 42 | 110 | 1 | 111 |
| PEA VOLTA | 32 | 36 | 111 | 147 |
| EV STATION | 30 | 38 | 10 | 48 |
| MEA EV | 15 | 24 | 5 | 29 |
| EleX by EGAT | 14 | 16 | 21 | 37 |
| SHARGE | 14 | 65 | 0 | 65 |
| PUMP CHARGE | 6 | 18 | 0 | 18 |
| EVen | 4 | 7 | 0 | 7 |
| onion | 2 | 8 | 0 | 8 |
| TOTAL | 693 | 1,511 | 774 | 2,285 |

6.2 Battery for EV Testing Laboratory

| | |
|----------------------|---|
| Location | Automotive and Tyre Testing, Research and Innovation Center (ATTRIC), Chachoengsao |
| Operated by | Thailand Automotive Institute |
| Area | 3,000 m ² |
| Testing scope | Battery performance testing and battery safety testing, which requires a safety test room that can support burning or battery explosion from the test. Plan to expand the scope in the future as well |
| Opening | 2 nd Quarter of 2022 |



UNECE R100 and UNECE R136 Testing capability

- | | | |
|--------------------------|--------------------------------|--------------------------------------|
| 1) Mechanical Integrity | 2) Over Temperature Protection | 3) External Short Circuit Protection |
| 4) Overcharge Protection | 5) Over-discharge Protection | 6) Mechanical Shock |
| 7) Vibration | 8) Thermal Shock | 9) Fire Resistance |



Thank you



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