

# Before and After

At the tipping point of Taiwan's car industry

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APR. 20<sup>th</sup> 2021

# Outline

- 1 The current situation
  - Sales
  - Taxes
- 2 Before: How we got here?
  - The origin
  - The groups
- 3 After: The electrified future?
  - World trend
  - Domestic opportunity

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Sales, FEB. 2021<sup>1</sup>

2021年2月進口車型掛牌數排行榜

排名	車型	掛牌數	排名	車型	掛牌數
1	Toyota RAV4	1214	11	M.Benz GLB	255
2	Mazda CX-5	604	12	M.Benz GLE	247
3	Mazda 3	463	13	Suzuki Jimny	236
4	M.Benz GLA	431	14	Lexus NX	235
5	M.Benz GLC	419	15	Lexus RX	232
6	Tesla Model 3	416	16	BMW 3-Series	210
7	Lexus UX	375	17	VW T-ROC	204
8	Mazda CX-30	337	18	Kia Picanto	181
9	Subaru Forester	295	19	M.Benz C-Class	180
10	M.Benz E-Class	294	20	M.Benz A-Class	160

2021年2月國產車型掛牌數排行榜

排名	車型	掛牌數	排名	車型	掛牌數
1	Toyota Corolla Cross	2205	11	Mitsubishi Colt Plus	345
2	Honda CR-V	1402	12	Hyundai Venue	324
3	Toyota Corolla Altis	989	13	Toyota Vios	322
4	Nissan Kicks	919	14	Nissan X-Trail	243
5	Ford Kuga	799	15	Honda HR-V	225
6	Ford Focus	632	16	Mitsubishi Outlander	198
7	Nissan Sentra	509	17	Luxgen URX	143
8	Toyota Yaris	483	18	Honda Fit	131
9	Toyota Sienta	479	19	Hyundai Tucson	81
10	Nissan Tilda	423	20	Luxgen U6	77

國產	進口
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XX	XX
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XX%	XX%
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<sup>1</sup>Data: 交通部公路總局, Table: Mobile01

# Sales by models: 2020

- RAV4
- SUV
- Foreign brand

## 2020年台灣汽車掛牌數排行榜 (1~12月)

排名	車型	全年掛牌數
1	Toyota RAV4	31870
2	Toyota Corolla Altis	29153
3	Honda CR-V	16300
4	Nissan Kicks	15739
5	Ford Focus	13189
6	Toyota Yaris	12220
7	Ford Kuga	12091
8	Toyota Corolla Cross	12080
9	Toyota Sienta	11902
10	Lexus NX	9010
11	M.Benz GLC	8195
12	Honda HR-V	8000

# Sales by brand: 2020

## 2020年度台灣汽車市場 品牌銷售總排名

排名	品牌	2020年掛牌數	市佔率	2019年掛牌數	2019年排名	去年比
1	Toyota	126485	27.7%	123315	1	2.6%
2	Mitsubishi (含中華)	49017	10.7%	47579	2	3%
3	Nissan	35177	7.7%	35793	3	-1.7%
4	Honda	30425	6.7%	33052	4	-7.9%
5	M.Benz	29640	6.5%	29249	5	1.3%
6	Ford	28884	6.3%	20791	7	38.9%
7	Lexus	22678	5.0%	22294	6	1.7%
8	BMW	18310	4.0%	16911	8	8.3%
9	Mazda	16260	3.6%	15369	9	5.8%
10	VW	13216	2.9%	15001	10	-11.9%
11	Hyundai	12384	2.7%	11268	11	9.9%
12	Suzuki	9765	2.1%	8008	12	21.9%
13	Volvo	7054	1.5%	6476	13	8.9%
14	Skoda	7041	1.5%	5768	15	22.1%
15	Tesla	5820	1.3%	3147	19	84.9%
16	Luxgen	4602	1.0%	4128	16	11.5%
17	Porsche	4354	1.0%	3782	18	15.1%
18	Kia	4133	0.9%	4056	17	1.9%
19	Subaru	3865	0.8%	6202	14	-37.7%
20	Audi	3017	0.7%	2464	20	22.4%

2020年台灣汽車市場總掛牌數：457444輛

# Taxes

- **關稅: 17.5%**
- 貨物稅: 25%
- 營業稅: 5%
- 奢侈稅: 10%

# 外匯車



BMW M340i xDrive

標準車型

NT\$3,470,000 ⓘ

200 萬 & 350 萬: arbitrage  
Why taxes?



BMW M340i xDrive Saloon

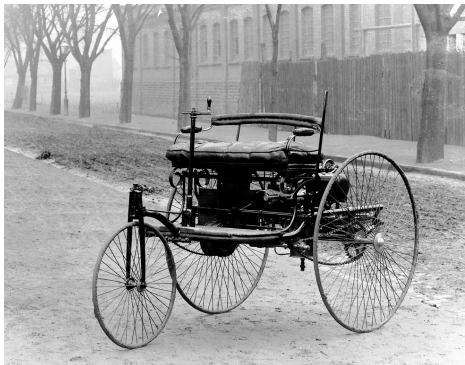
M MODELS

ES0,875.00 ⓘ



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# The origin, 1885<sup>2</sup>



Benz Patent-Motorwagen ("patent motorcar"),  
built in 1885 by Karl Benz

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<sup>2</sup>[The fight over the birth of the modern automobile] (in German). German Patent and Trade Mark Office. 2014-12-22.

# Mass production

Model T, Ford, 1913



moving assembly line

Toyota, 1950s



JIT

# 裕隆飛羚 101, 1986



# The groups

- BIG group
  - cross-country alliance
  - resources share
  - well-established industry
  - hard to disrupt
- **Daimler:** M.Benz, M.Maybach, Truck
  - **BMW Group:** BMW, Mini, Rolls-Royce
  - **Volkswagen:** VW, Audi, Bentley, Seat, Bugatti, Lamborghini, Scoda, Porsche, Scania, MAN
  - **Renault Nissan Mitsubishi**
  - **Stellantis:** Maserati, Peugeot, Citroen, Alfa Romeo, Fiat, Chrysler
  - **Jaguar Land Rover**
  - 吉利沃爾沃

# Hyundai-Kia



# Domestic

- 裕隆: 裕日、中華、華創、東風裕隆
- 國瑞: 和泰、Toyota
- 台灣本田: Honda
- 福特六和: Ford
- 三陽工業: Hyundai

# The tears

- Engine
- Gear-box
- Market
- Government subsidy?





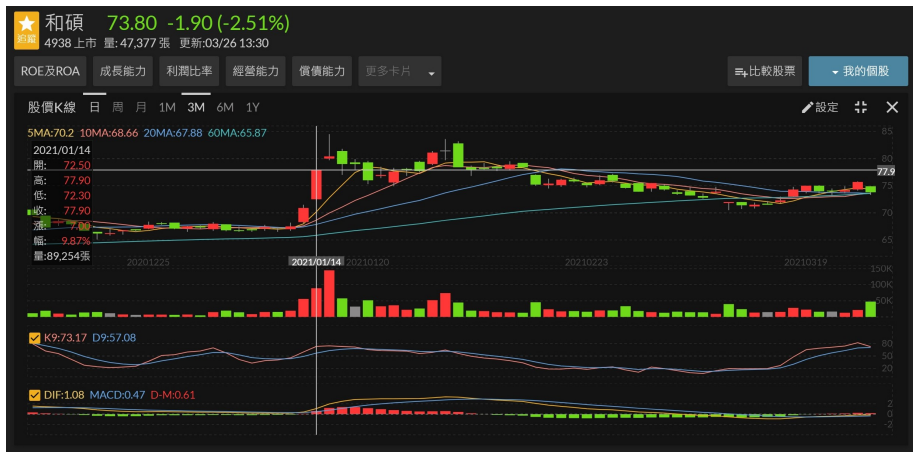
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# The opportunity?

- No Engine
- No Gear box
- New market
- Government subsidy.



# The tears



〈熱門股〉和碩搭上電動車快車周漲近 2 成飆三年新高<sup>3</sup>

<sup>3</sup><https://news.cnyes.com/news/id/4561169>

## The groups

- **Daimler:** By 2022 we will be bringing more than ten different all-electric vehicles to market. We will also be **electrifying the entire Mercedes-Benz portfolio** and our customers will thus have the choice of at least one electric alternative in every Mercedes-Benz model series, taking the total to 50 overall."<sup>4</sup>
- **BMW:** "50% PERCENT OF BMW GROUP VEHICLES IN EUROPE ELECTRIFIED by 2030."<sup>5</sup>
- **Volkswagen:** "By 2030 at the latest, Volkswagen Group brands will be **offering at least one all-electric or hybrid version of their entire portfolio, comprising some 300 different models.**"<sup>6</sup>

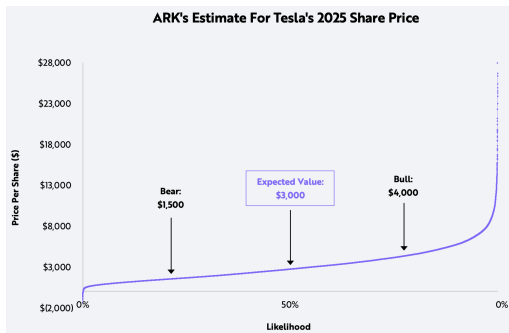
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<sup>4</sup>Plans for more than ten different all-electric vehicles by 2022: All systems are go

<sup>5</sup>BMW GROUP E-MOBILITYSTRATEGY, 2019

<sup>6</sup>Roadmap E: full of energy!, 2020

# The investor<sup>7</sup>

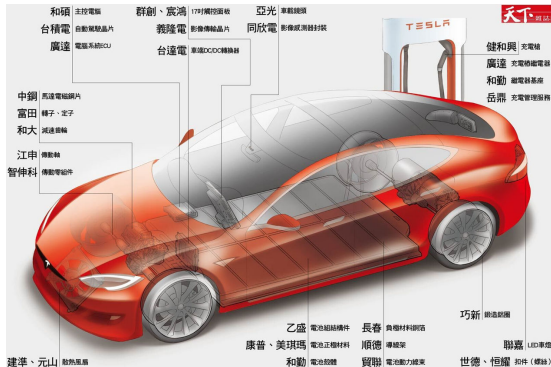


	2020	2025, Bear	2025, Bull
Cars Sold (millions)	0.5	5	10
Average Selling Price (USD)	50,000	45,000	36,000
Share Price (USD)	700	1500	4000

<sup>7</sup>ARK's Price Target for Tesla in 2025, Tasha Keeney, ARK Invest, 2021

# Domestic opportunity

- 馬達: 富田電機
- 車用電子: 和碩
- 電供: 台達電、康舒
- 傳動: 和大
- 電網: 華城
- ...



# Foxtron: MIH<sup>8</sup>



## 3. 技術規格

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### 3.3.1. 機車控制介面

ESC 系統制動系統如下表所示：

縮寫名稱	名稱	描述	狀態
ADAS_DeReq	Vehicle Deceleration Request	減速需求中狀態	Ts
ADAS_DeReq_A	Vehicle Deceleration Request Application	減速需求生效中	Ts
ADAS_AdReq	AEB Request	前向 AEB 需求狀態	Ts
ADAS_AdReq_A	AEB Request Application	AEB 需求生效中	Ts
LongAccel	Longitudinal Acceleration	車縱向加減速	Ra
LongAccel_V	Longitudinal Acceleration Validity	車縱向加減速有效性	Ra
LatAccel	Lateral Acceleration	車橫向加減速	Ra
LatAccel_V	Lat Acceleration Validity	車橫向加減速有效性	Ra
YawRate	Yaw Rate	車偏航速率	Ra
Ycrash_V	Ycrash Validity	車偏航速率有效性	Ra
Brake_Sls	Brake switch signal status	車剎車狀態	Ra
Brake_V	Brake switch signal Valid	車剎車狀態有效性	Ra
Brake_V	Brake switch signal Valid	車剎車狀態有效性	Ra
GMRES	Gearbox Operation	檔位操作狀態	Ra
GMRES_V	Gearbox Operation Validity	檔位操作狀態有效性	Ra
Blower_Status	Blower Venturi Level Relative to Ambient	風量控制	Ra
Blower_Venturi_Full	Blower Venturi Level Diagnosis	風量控制故障	Ra
MCPressure	Master Cylinder Pressure	制動壓力	Ra
MCPressure_V	Master Cylinder Pressure Validity	制動壓力有效性	Ra
PGA_Active	Panic Brake Assist Active	PGA 主動狀態	Ra
PGA_Active_V	Panic Brake Assist Active Validity	PGA 主動狀態有效性	Ra
ASB_Active	Anti-lock System Active	ABS 主動狀態	Ra
ASB_Active_V	Anti-lock System Active Validity	ABS 主動狀態有效性	Ra
EBC_Active	Electronic Brake System Active	EBS 主動狀態	Ra
EBC_Active_V	Electronic Brake System Active Validity	EBS 主動狀態有效性	Ra
ESC_Active	ESC System Active	ESC 主動狀態	Ra
ESC_Active_V	ESC System Active Validity	ESC 主動狀態有效性	Ra
ESC_Deactivated	ESC System Deactivated	ESC 系統失效	Ra
RF_RawIMUSpeed_R_V	Right Rear Wheel Speed Low Resolution Validity	RR 右後輪低速且無效	Ra
LR_RawIMUSpeed_L_V	Left Rear Wheel Speed Low Resolution Validity	LR 左後輪低速且無效	Ra
RF_RawIMUSpeed_R_V	Right Rear Wheel Speed Low Resolution Validity	RR 右後輪低速且無效	Ra
LF_RawIMUSpeed_L_V	Left Front Wheel Speed Low Resolution Validity	LF 左前輪低速且無效	Ra
RF_RawIMUSpeed_R_V	Right Front Wheel Speed Low Resolution Validity	RF 右前輪低速且無效	Ra
LF_RawIMUSpeed_L_V	Left Front Wheel Speed Low Resolution Validity	LF 左前輪低速且無效	Ra
RF_RawIMUSpeed_R_V	Right Front Wheel Speed Low Resolution Validity	RF 右前輪低速且無效	Ra
RF_Win_PNC_V	Right Front Wheel Pulse Counter Validity	RF 右前輪計數器	Ra
LF_Win_PNC_V	Left Front Wheel Pulse Counter Validity	LF 左前輪計數器	Ra
RF_Win_PNC_V	Right Front Wheel Pulse Counter Validity	RF 右前輪計數器	Ra
LF_Win_PNC_V	Left Front Wheel Pulse Counter Validity	LF 左前輪計數器	Ra
RF_Win_PNC_V	Right Front Wheel Pulse Counter Validity	RF 右前輪計數器	Ra
LR_Win_PNC_V	Left Rear Wheel Pulse Counter Validity	LR 左後輪計數器	Ra
RR_Win_PNC_V	Right Rear Wheel Pulse Counter Validity	RR 右後輪計數器	Ra
LR_Win_PNC_V	Left Rear Wheel Pulse Counter Validity	LR 左後輪計數器	Ra
RR_Win_PNC_V	Right Rear Wheel Pulse Counter Validity	RR 右後輪計數器	Ra
LR_Win_PNC_V	Left Rear Wheel Pulse Counter Validity	LR 左後輪計數器	Ra
RR_Win_PNC_V	Right Rear Wheel Pulse Counter Validity	RR 右後輪計數器	Ra

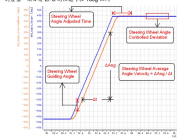
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### 3.3.2. 避震 Wheel Angle Controlled Deviation 及高壓平台內車角異位避震輪日轉角度

的差異，與避震 EPS 的轉角可在  $\pm 10$ deg 以內。



### EPS 轉角在 A 狀態：

EPS 轉角在 A 狀態時轉角如下表所示：

縮寫名稱	名稱	描述	狀態
ADAS_GPS_Ste	ADAS Status	輔助駕駛系統狀態	Ts
ADAS_SteReq	ADAS Status Request	輔助駕駛系統狀態請求	Ts
ADAS_SteReq_V	ADAS Status Request Validity	輔助駕駛系統狀態請求有效性	Ts
ADAS_SteTqReq	Steering Torque Request	轉角需求請求	Ra
ADAS_SteTqReq_A	Steering Torque Request Application	轉角需求請求生效中	Ra
CurrentSteeringTorqueRequest	Current Steering Torque Request	車角需求請求中即時值	Ra
CurrentSteeringTorqueRequestApplication	Current Steering Torque Request Application	車角需求請求中即時值生效中	Ra
DriverIntent	Driver Intent	駕駛人 intentions 狀態	Ra
EPS_AccMS_Status	EPS ACDAS Status	輔助 ACDAS 系統狀態	Ra
EPS_ACDAS_Status	EPS ACDAS Status	輔助 ACDAS 系統狀態	Ra
EPS_Failed	EPS Failed	輔助駕駛系統失效	Ra
Steering_Tq_Failed	Steering Torque Failed	車角需求中無效	Ra
Steering_Torque	Steering Torque	車角需求	Ra

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# Foxtron: MIH

## 4個級距 模組彈性客製



**B+**  
軸距2750



**C**  
軸距2860



**D**  
軸距2950



**E**  
軸距3100

3種 驅動	前驅	●	○	●	●
	後驅	○	●	●	●
	四驅	○	●	●	●
3種 電池包	小 ~93kWh	●			
	中 ~100kWh		●	●	
	大 ~116kWh				●
前懸吊	前懸吊	麥花臣	雙A臂	雙A臂	雙A臂
	後懸吊	拖曳臂	多連桿	多連桿	多連桿
電機規格		前電機單速95kW~200kW，後電機單速150kW~240kW及2速340kW			



Thanks!

