

強茂集團

PANJIT International Inc.

Investor Relations

Accountability



Customer Focus



Mutual Trust and  
Collaboration



Innovation



Learning and  
Growth





## 無錫至極動能科技有限公司

Sumnergy

成立: 2017.6

營業項目:

電池管理系統, 電池組

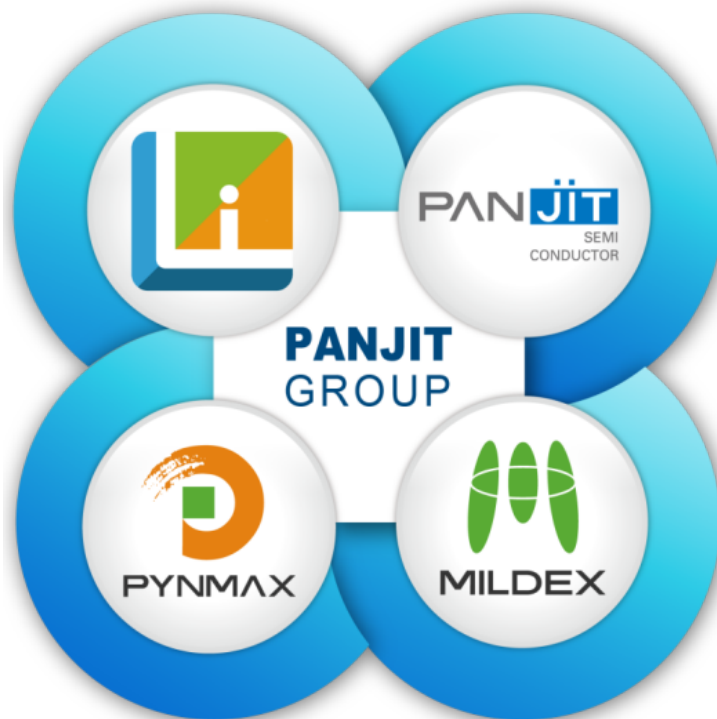
## 環茂科技股份有限公司

PYNMAX

成立: 2000.3

營業項目:

晶圓製造



## 強茂股份有限公司

PANJIT

成立: 1986.5

營業項目:

功率式元件、封裝測試

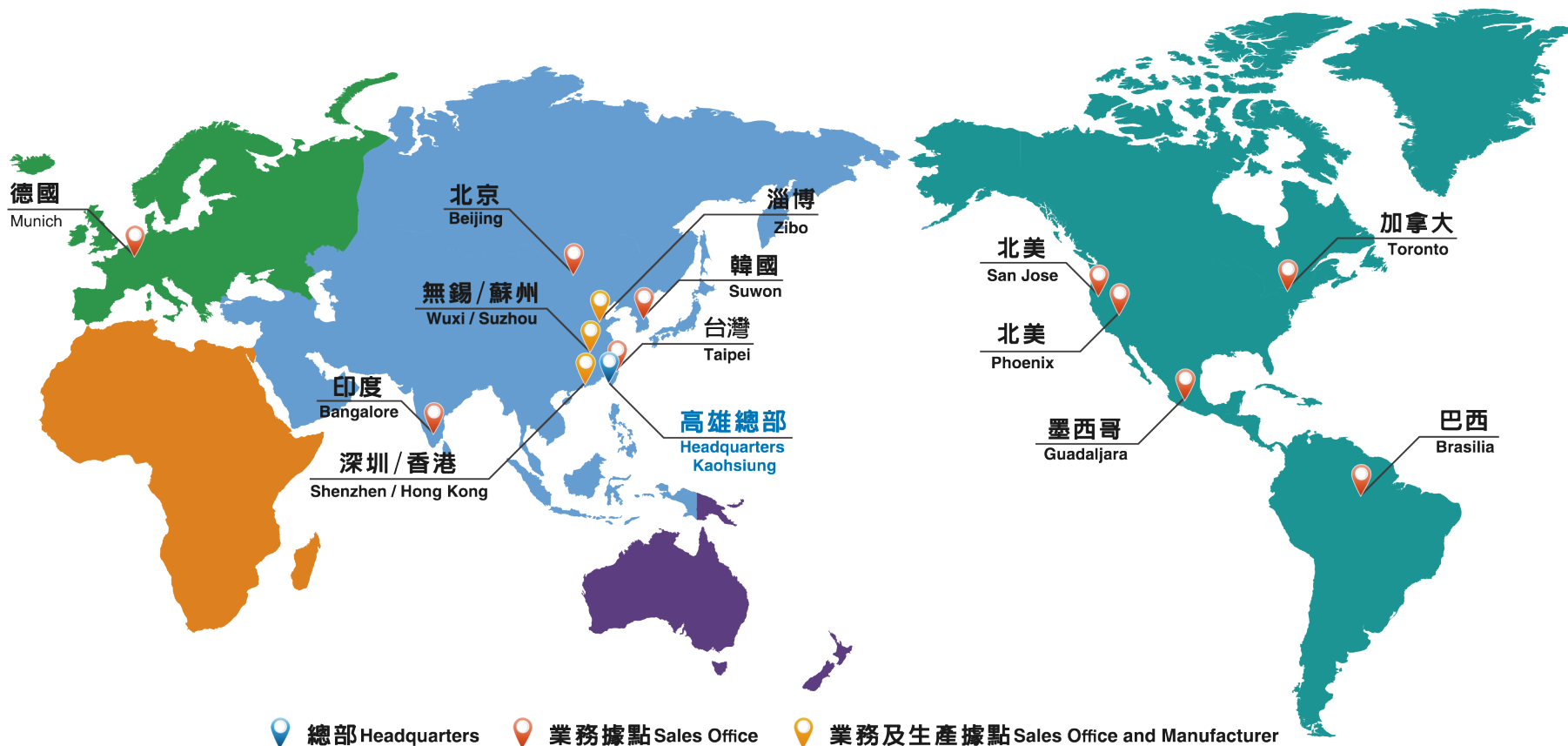
## 熒茂光學股份有限公司

MILDEX

成立: 2005.5

營業項目:

觸控面板 (工業/軍用)



- 上市公司：台灣2481 (2000上市)
- 總部：高雄, 台灣
- 市場排名
  - 全球二極體 # 7
  - 亞太區 分離式器件公司 # 1
- 營業額
  - 2017 集團營收 3.98 億美金, 集團營業利益 0.31 億美金
  - 2017 汽車應用占比 0.27億美金
  - 主要客戶包含了全球 EMS, 汽車應用, 工業應用, 發光二極體以及觸控面板, 包含了亞太區,韓國區,美洲區,和歐亞區

No.	2016		2017	
1	Vishay	10%	Vishay	11%
2	Rohm	9%	Rohm	10%
3	ON Semiconductor	7%	ON Semiconductor	8%
4	Microsemi	7%	Infineon Technologies	7%
5	Infineon Technologies	7%	Microsemi	7%
6	NXP	6%	Diodes	6%
7	STMicroelectronics	6%	<b>PANJIT</b>	<b>5%</b>
8	Diodes	6%	STMicroelectronics	5%
9	<b>PANJIT</b>	<b>5%</b>	Nexperia	4%
10	Semtech	4%	Good-ark	4%
	Others	33%	Others	33%

- 全球二極體營收排名: # 7<sup>th</sup>

\*Diodes above 0.5 amps.

Excluding RF diode

# 全球分離器件排名

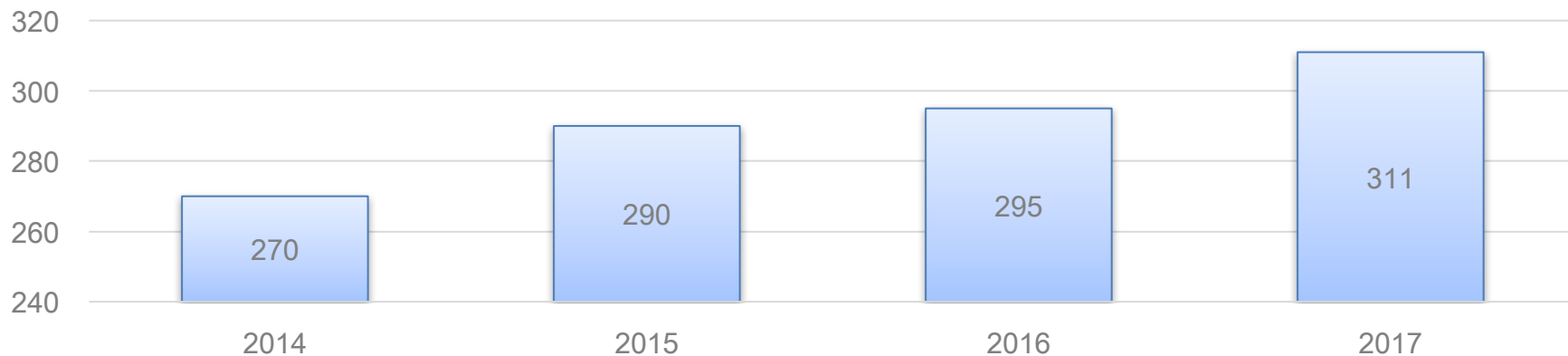
No.	2016		2017	
1	Infineon Technologies	13%	Infineon Technologies	14%
2	ON Semiconductor	8%	ON Semiconductor	10%
3	NXP	8%	Mitshubishi	6%
4	Mitsubishi	6%	Nexperia	6%
5	STMicroelectronics	6%	Rohm	6%
6	Vishay	5%	Toshiba	5%
7	Toshiba	5%	Vishay	5%
8	Rohm	5%	STMicroelectronics	5%
9	Renesas Electronics	4%	Renesas Electronics	4%
10	Fuji Electric	3%	Fuji Electric	3%
11	Diodes	3%	Diodes	3%
12	Fairchild Semiconductor	2%	Microsemi	2%
13	Microsemi	2%	AOS	2%
14	Toyota	2%	<b>PANJIT</b>	<b>2%</b>
15	<b>PANJIT</b>	<b>2%</b>	Shindengen Electric	2%
16	Shindengen Electric	2%	Toyota	2%
17	Denso	1%	Denso	1%
18	IXYS	1%	IXYS	1%
	Others	22%	Others	21%

- 分離式器件(包括二極管, MOSFET, IGBT and etc.)全球營收排名:15<sup>th</sup>

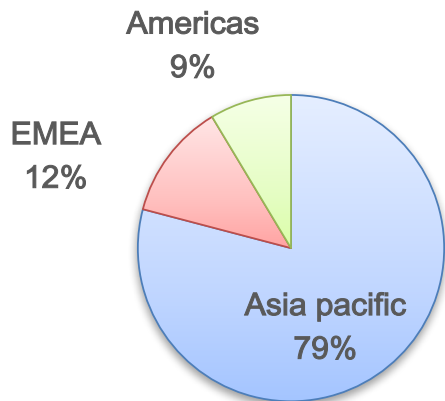
Excluding RF diode

單位: 百萬 美金

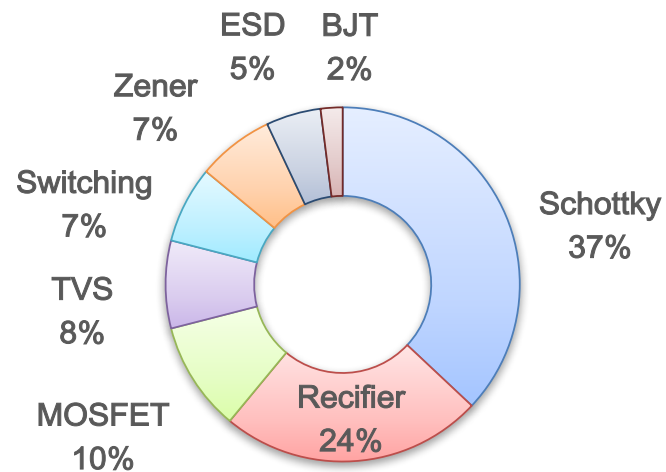
## 營業收入



## 區域別

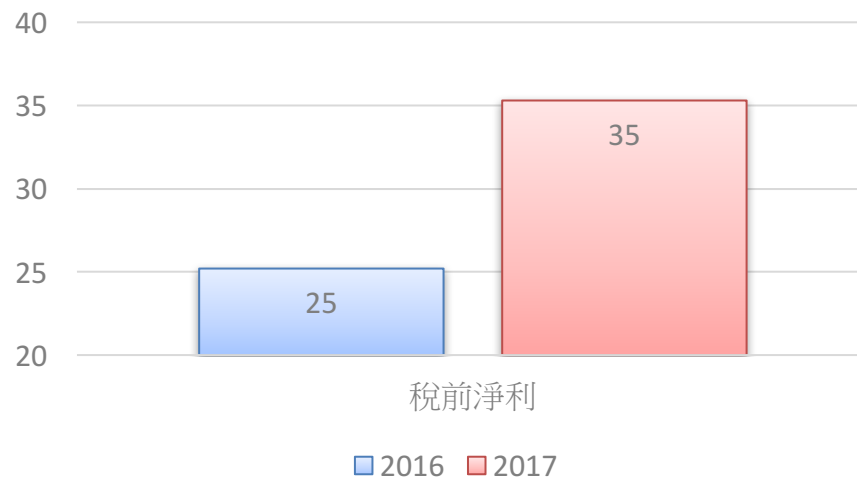
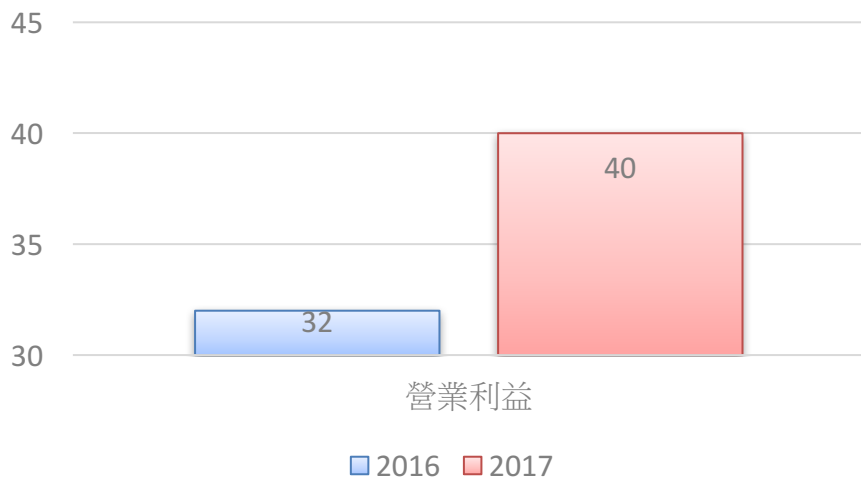
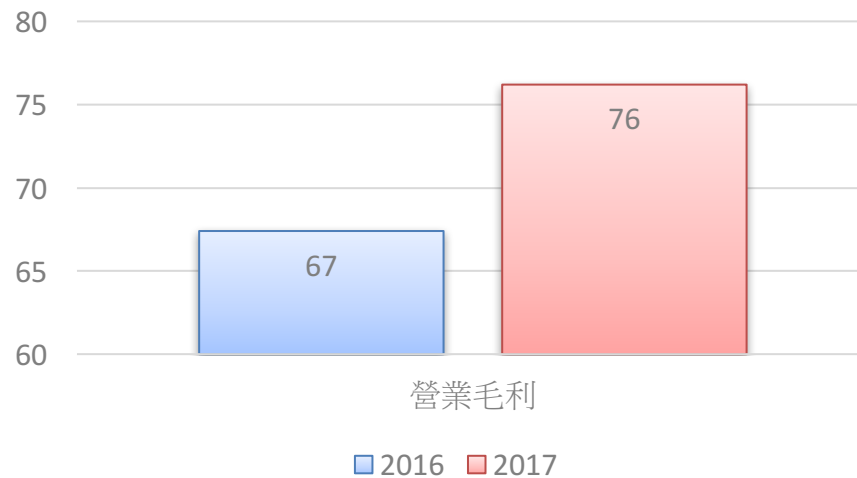
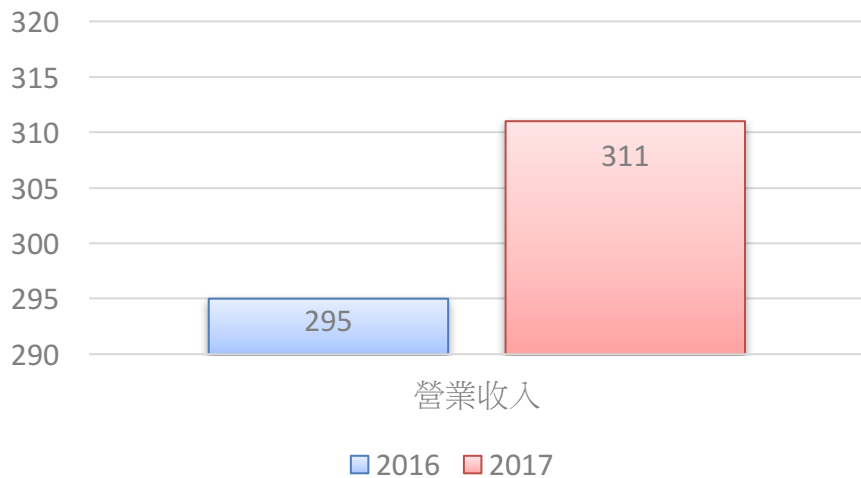


## 產品別





單位: 百萬美金



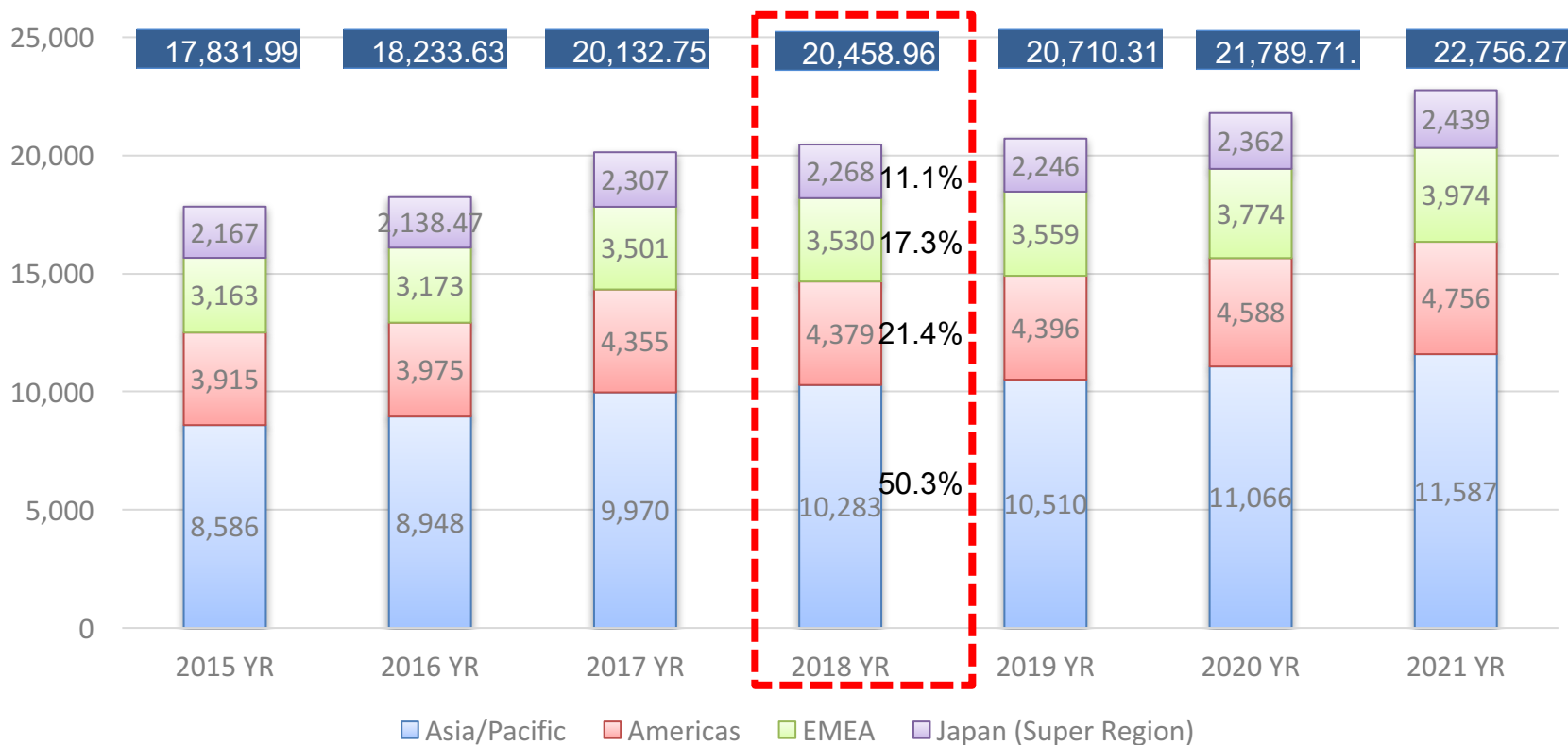
單位: 仟元 美金	2017	%	2016	%
現金	32,234	4.9%	27,133	4.4%
應收款項	146,837	22.1%	136,323	22.0%
存貨	74,539	11.2%	57,777	9.3%
資產總計	663,254	100.0%	620,068	100.0%
短期借款	59,591	9.0%	27,035	4.4%
應付款項	78,512	11.8%	54,852	8.8%
長期借款	191,333	28.8%	191,859	30.9%
負債總計	420,254	63.4%	365,583	59.0%
股東權益	243,000	36.6%	254,485	41.0%
每股淨值 (NTD)	16.22		18.25	

單位: 仟元 美金	2017	%	2016	%	Diff
二極體事業處	310,722	79.5%	280,171	70.4%	30,551
光學面板事業處	58,949	15.1%	74,388	18.7%	-15,439
太陽能事業處	20,804	5.3%	44,920	11.3%	-24,116
其他	228	0.1%	(1,398)	-0.4%	1,626
營業收入	390,703	100.0%	398,081	100.0%	-7,378
營業毛利	87,314	22.3%	80,317	20.2%	6,997
營業利益	30,977	7.9%	24,300	6.1%	6,677
稅前淨利(損)	6,446	1.6%	29,820	7.5%	-23,374
所得稅	12,116	3.1%	6,950	1.7%	5,166
稅後淨利(損)	(5,670)	-1.5%	22,869	5.7%	-28,539
EPS (NTD)	(0.92)		1.66		

# 全球分離式器件半導體市場預測

單位：百萬美金

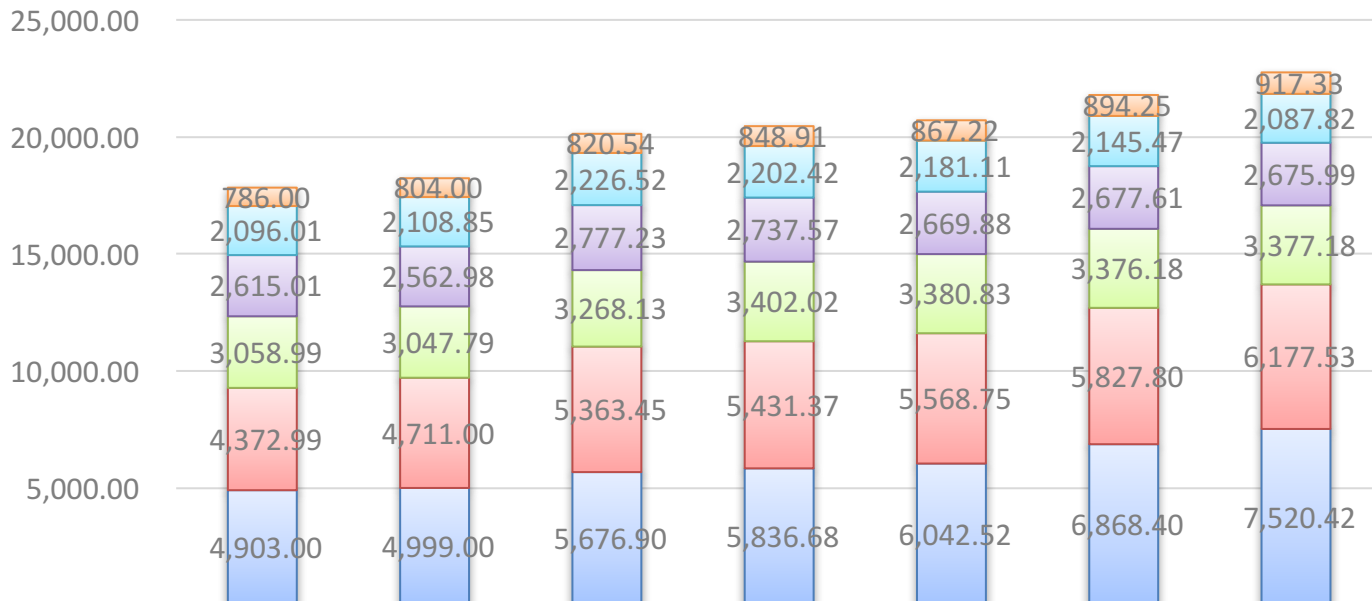
## 全球分離式器件半導體預測 (區域別)



- 未來分離式器件半導體主要需求，將持續著重在亞太區，市場占比為50%

# 全球分離式器件半導體市場預測

單位：百萬美金



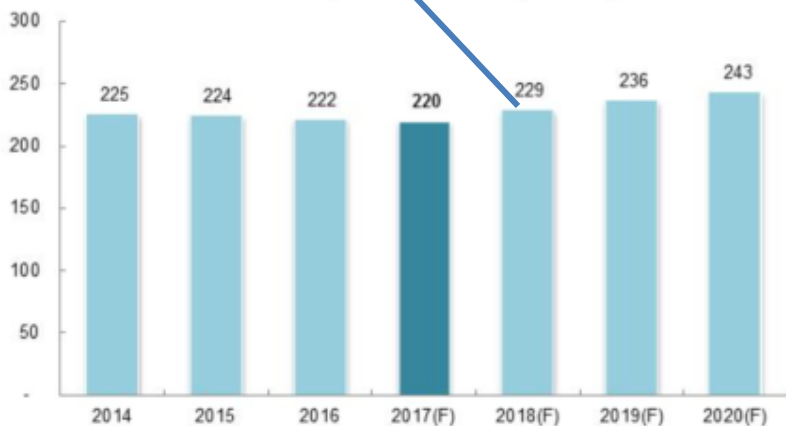
	2015 YR	2016 YR	2017 YR	2018 YR	2019 YR	2020 YR	2021 YR
■ Military/Civil Aerospace Electronics	786.00	804.00	820.54	848.91	867.22	894.25	917.33
■ Data Processing Electronics	2,096.01	2,108.85	2,226.52	2,202.42	2,181.11	2,145.47	2,087.82
■ Consumer Electronics	2,615.01	2,562.98	2,777.23	2,737.57	2,669.88	2,677.61	2,675.99
■ Communication Electronics	3,058.99	3,047.79	3,268.13	3,402.02	3,380.83	3,376.18	3,377.18
■ Automotive Electronics	4,372.99	4,711.00	5,363.45	5,431.37	5,568.75	5,827.80	6,177.53
■ Industrial Electronics	4,903.00	4,999.00	5,676.90	5,836.68	6,042.52	6,868.40	7,520.42

- 在2018-2022，汽車應用以及工業應用將持續為分離式器件的主要應用別。

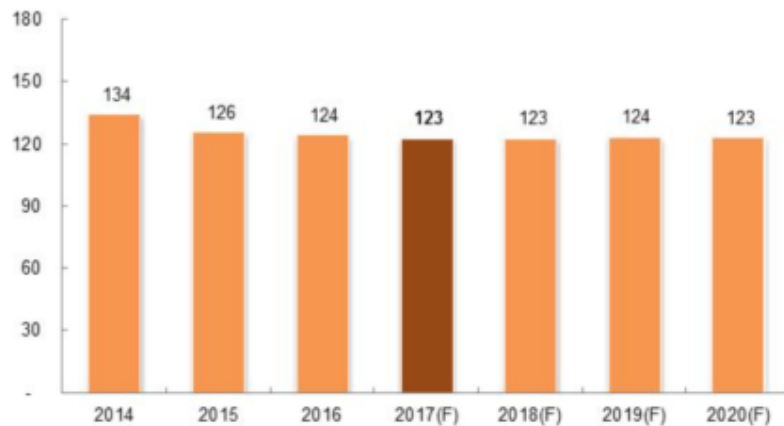
# 消費性電子市場

2018成長率: 4%

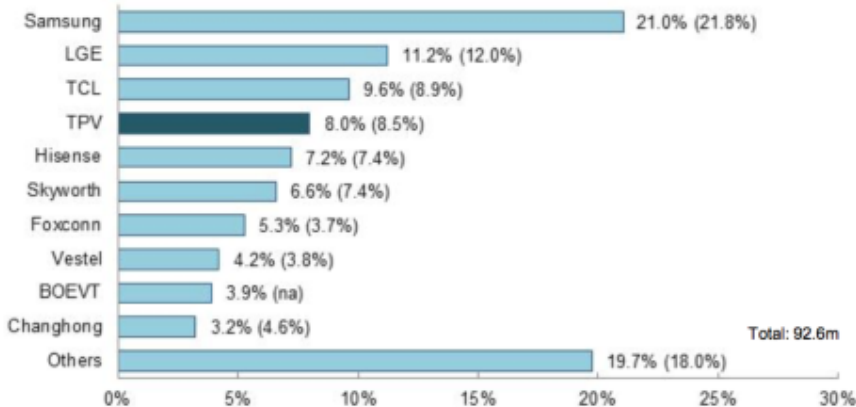
TV Global Shipment Forecast (Units M)



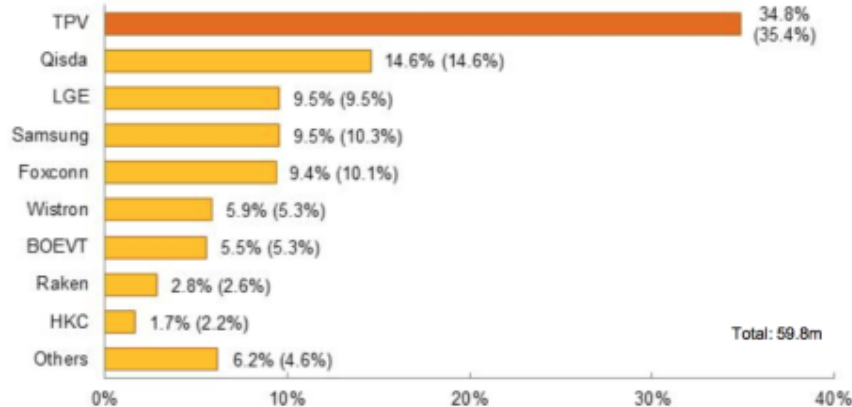
Monitor Global Shipment Forecast (Units M)



Worldwide LCD TV Manufacturer Share

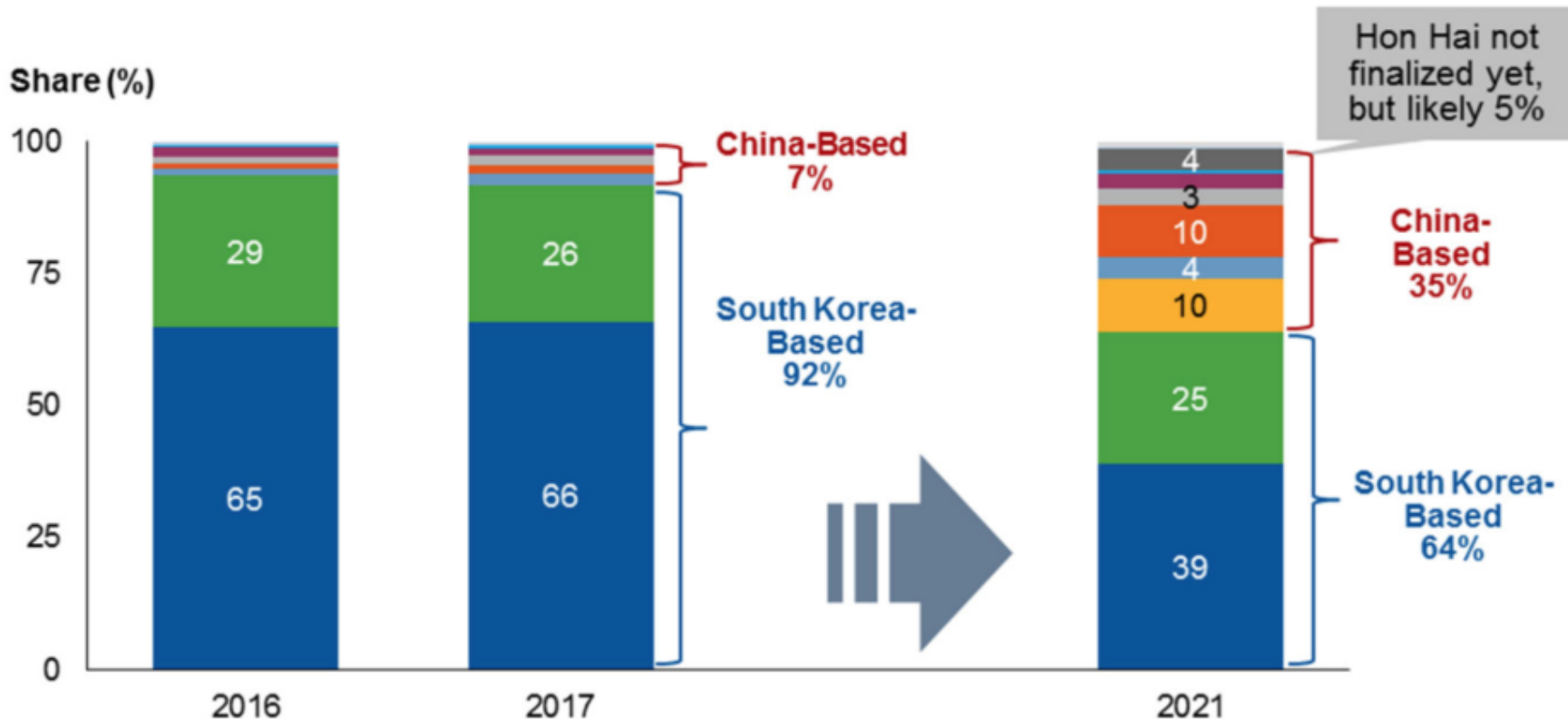


Worldwide Monitor Manufacturer Share



## AMOLED 全球產能市場占比 2016-2021

■ SDC ■ LGD ■ LGD JV in China ■ Tianma ■ BOE ■ Visionox ■ EDO ■ Truly ■ CSOT ■ AUO ■ JDI

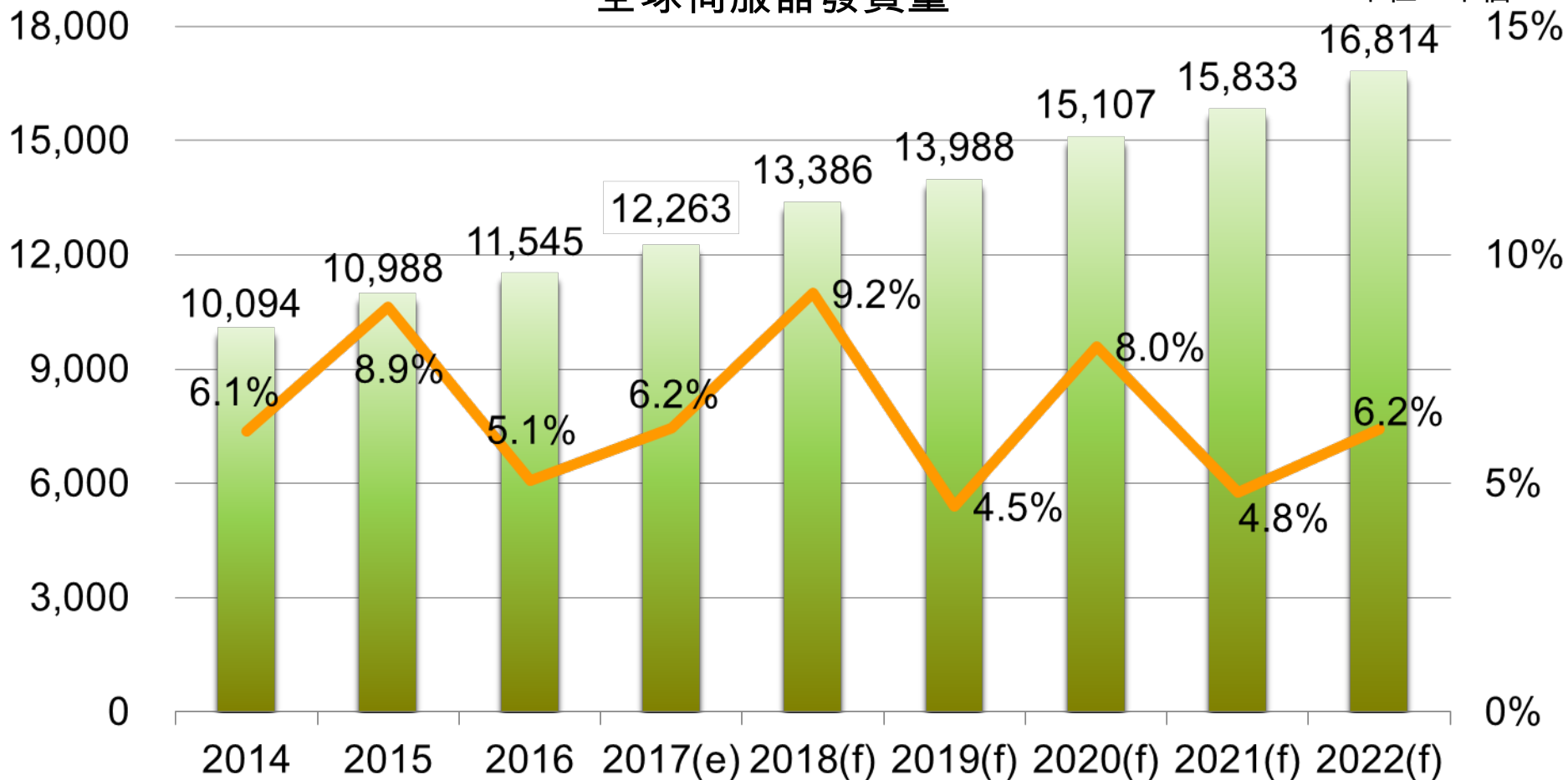


- 2021 AMOLED市場，中國廠商將佔全球產能35%



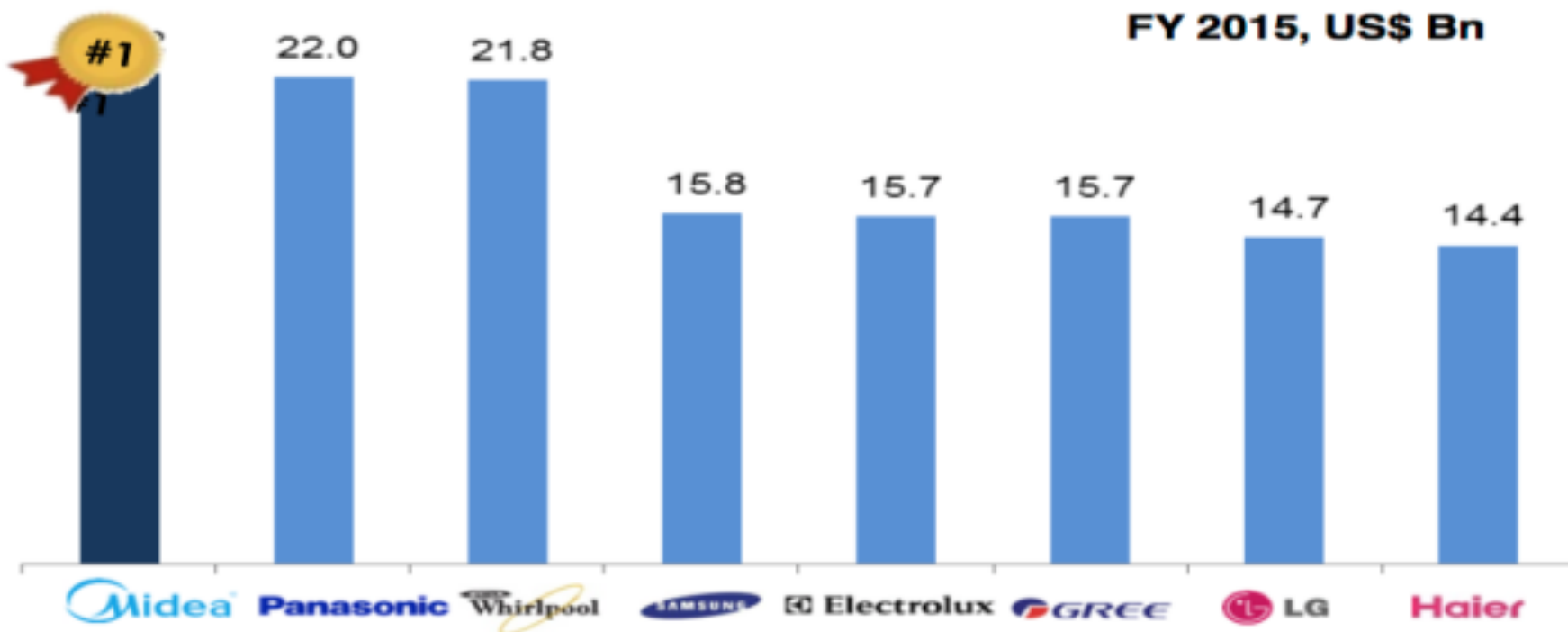
## 全球伺服器發貨量

單位：千個



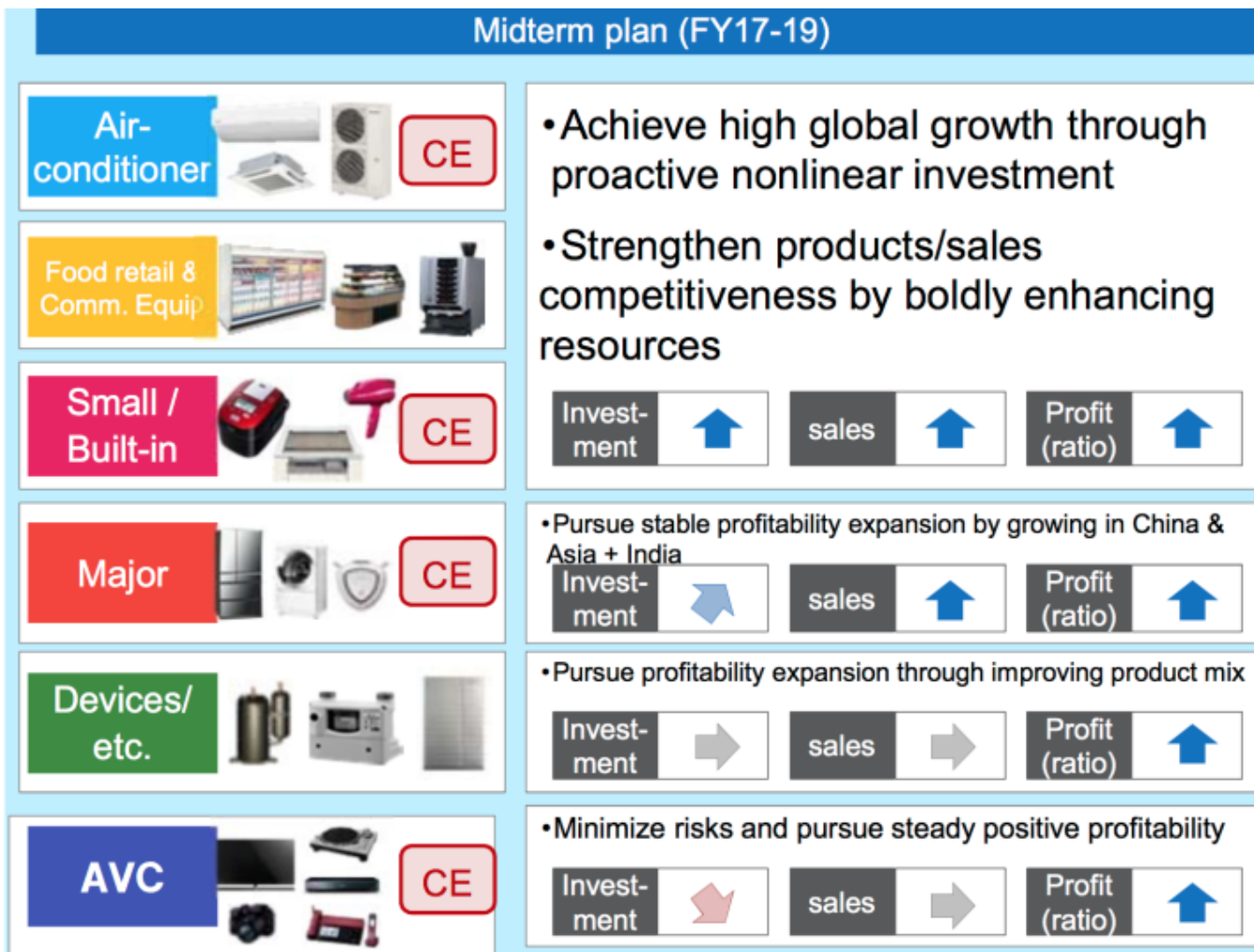
- 2017-2022，全球伺服器發貨量的複合年均增長率為 6.5%

## 全球消費性家電營業額排名



- 2021，市場主要家用電器產值預計達到 281億美金

source: Home Improvement Research Institute

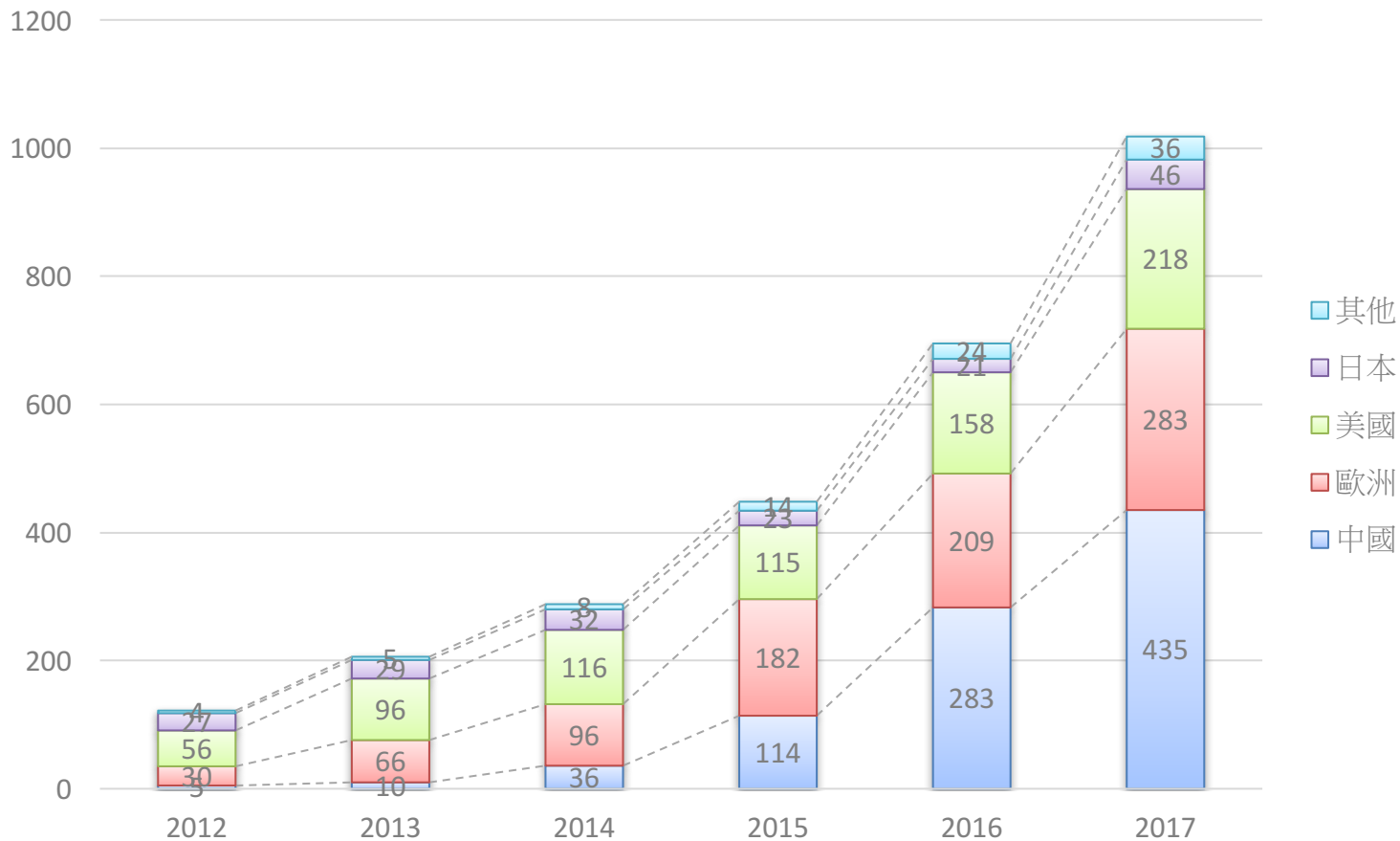


- 專注在有潛力的市場裡

# 汽車應用市場

# 全球電動車銷售排行

## 2012-2017全球電動車市場區域別銷售量

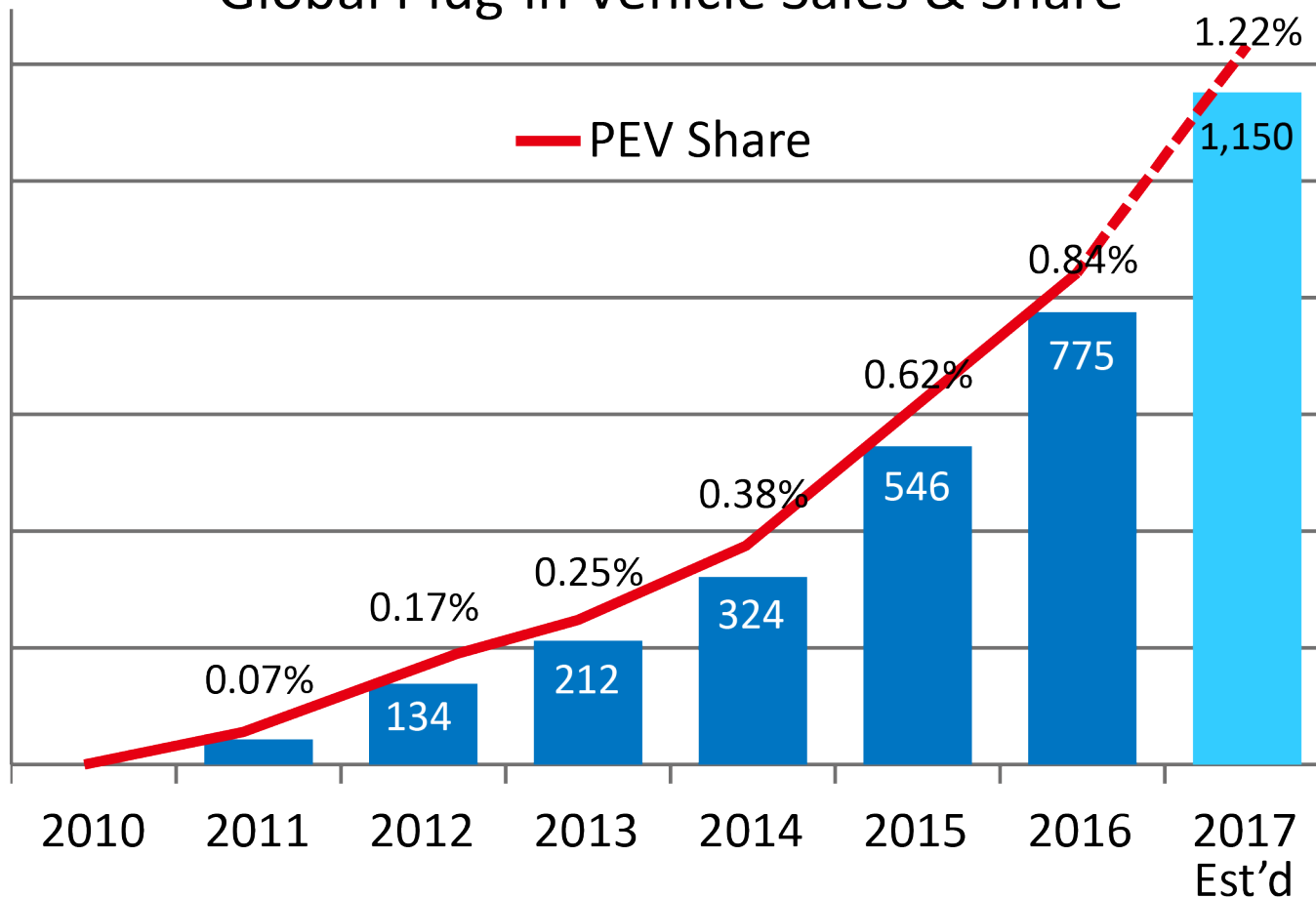


電動車包誇純電動車和插電式混合車

大陸市場扣除低速及商用EV車款

資料來源：BNEF、各車廠、DIGITIMES Research 整理 2018/2

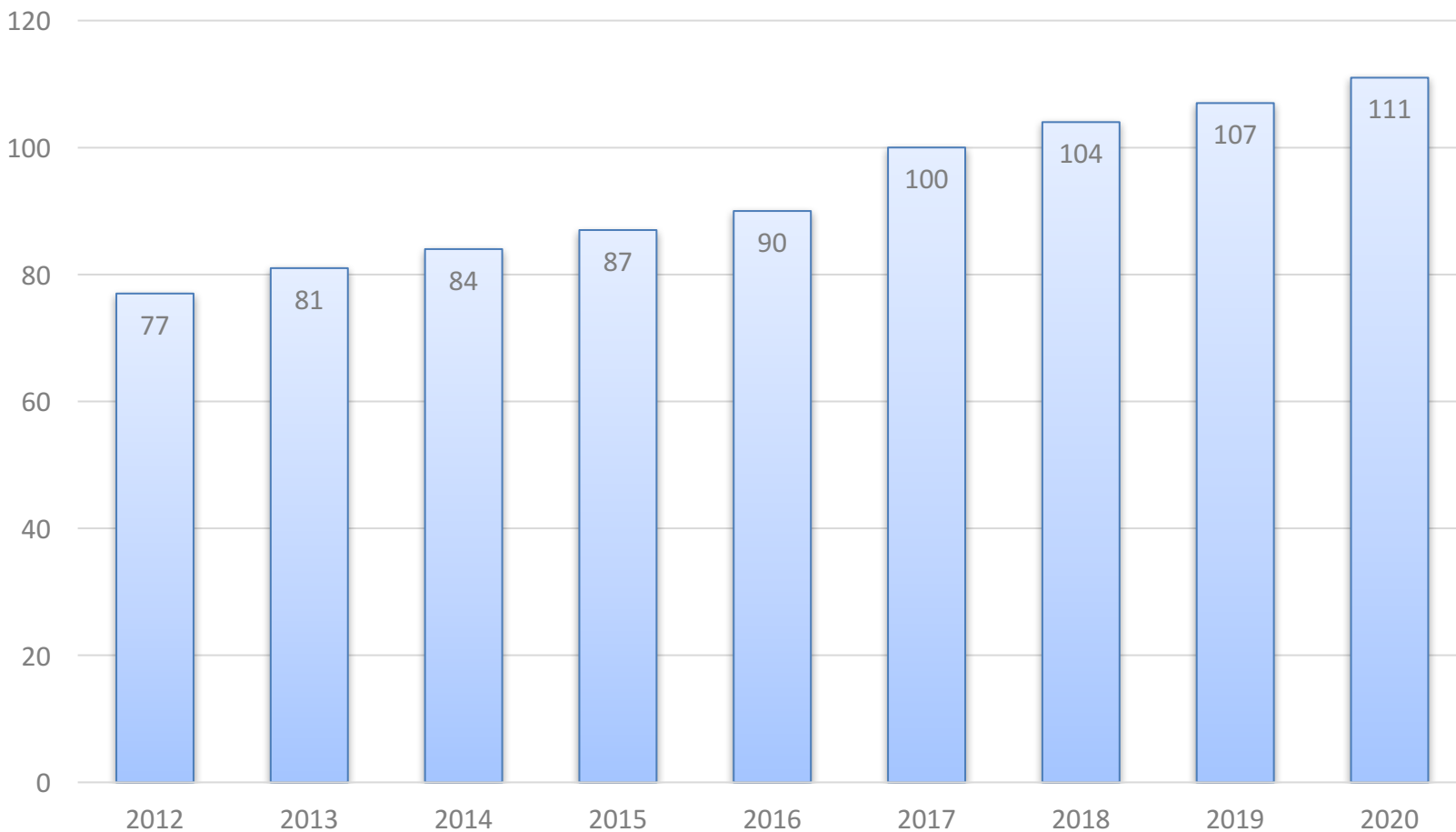
## Global Plug-in Vehicle Sales & Share



- 全世界電動車2017年銷售量將達成1,150,000輛(對比2016年成長48%)，約汽車總銷售量的1.22%

# 全球汽車銷售量

單位：百萬(輛)



## 先進駕駛輔助系統

- APA
- LDWS/FCW
- BSD

## 車裡控制與環境舒適

- Air conditioning
- Windshield wiper
- Seats
- Seat belt
- Car windows
- Sunroof
- Review mirror
- USB Charger

## 動力傳動

- Start-stop system
- Engine Control Unit
- Electric Power steering wheel (EPS)

## 感應器

- Ultrasonic sensor
- Front/Rear Camera
- Millimeter Wave Radar
- Lidar

## 發動機

- Cooling Fan
- Oil Pump
- Water Pump

## 照明

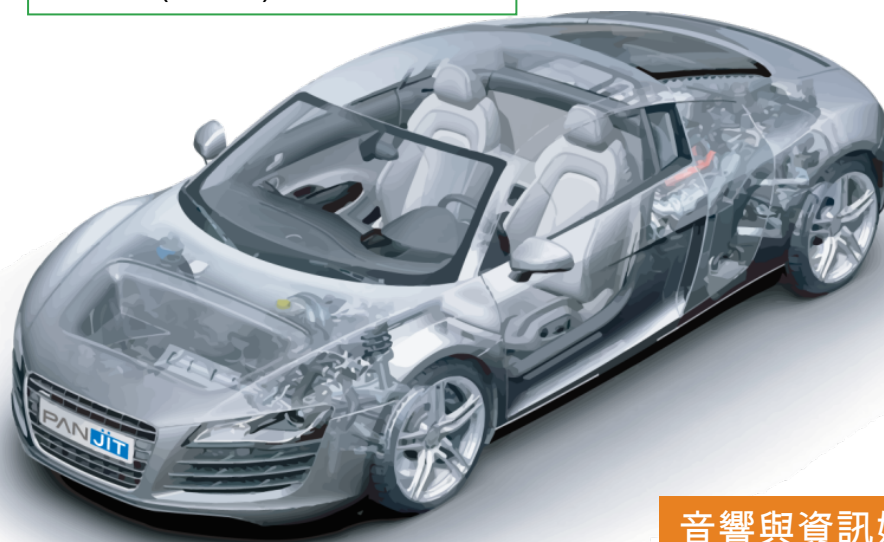
- HID
- AFS
- DRL
- Interior Lamp
- Rear Lamp

## 音響與資訊娛樂

- Analog / Digital audio player
- Navigation device
- E-Mirror
- Event data recorder(EDR)
- Dashboard

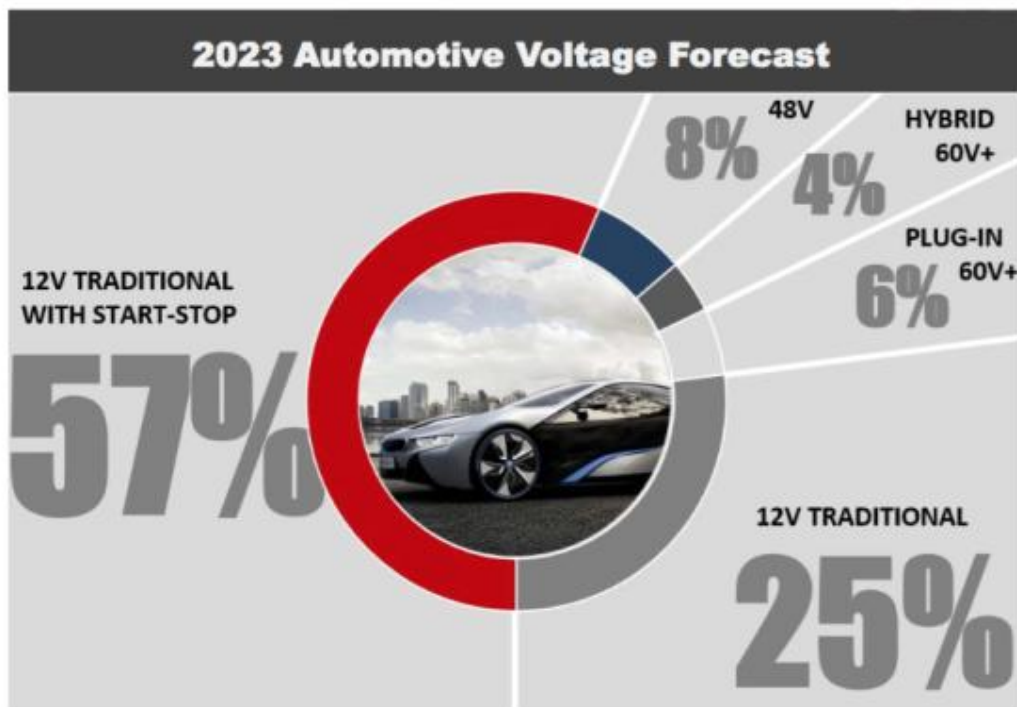
## 電動車

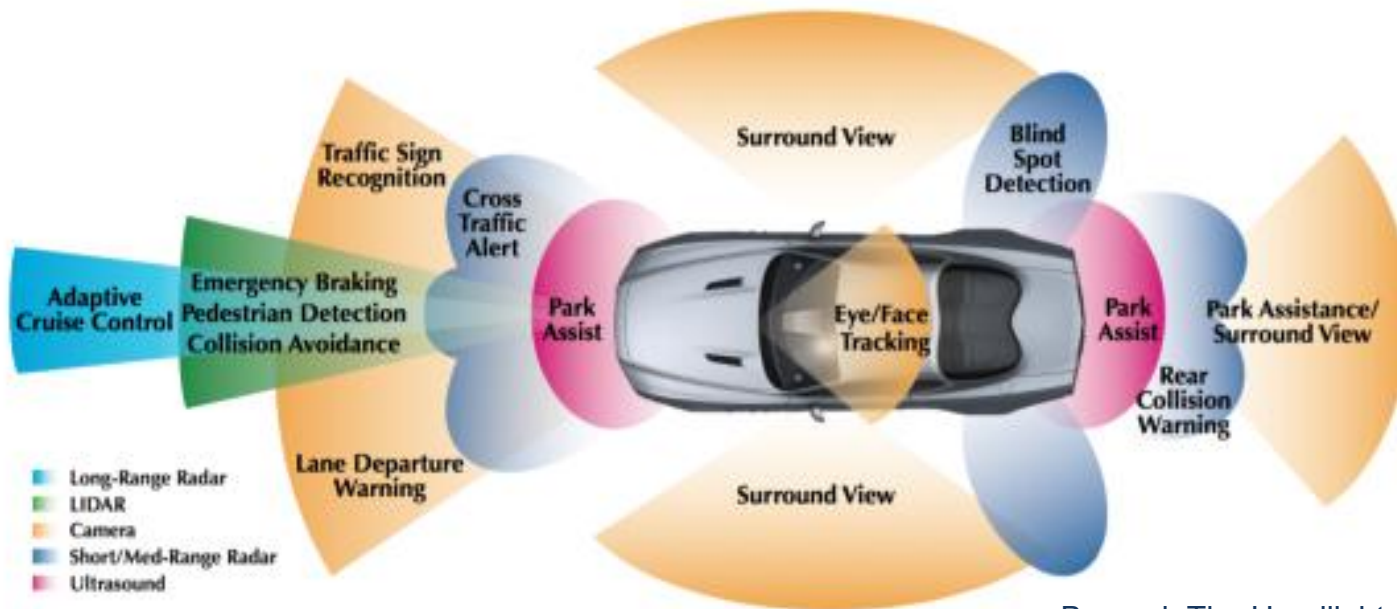
- EV/HEV pilot system
- Battery Management System (BMS)





- E-Systems product portfolio is scalable across the full spectrum of vehicle voltage levels – 12V to High Power
- Market trends support growth in both 12V and High Power applications
- 48V and other high voltage electrical systems are expected to grow rapidly, reaching 18% of the market by 2023 from less than 5% today
- While the majority of vehicles will remain on a 12V system, growth in 48V and other high voltage systems represents incremental content per vehicle





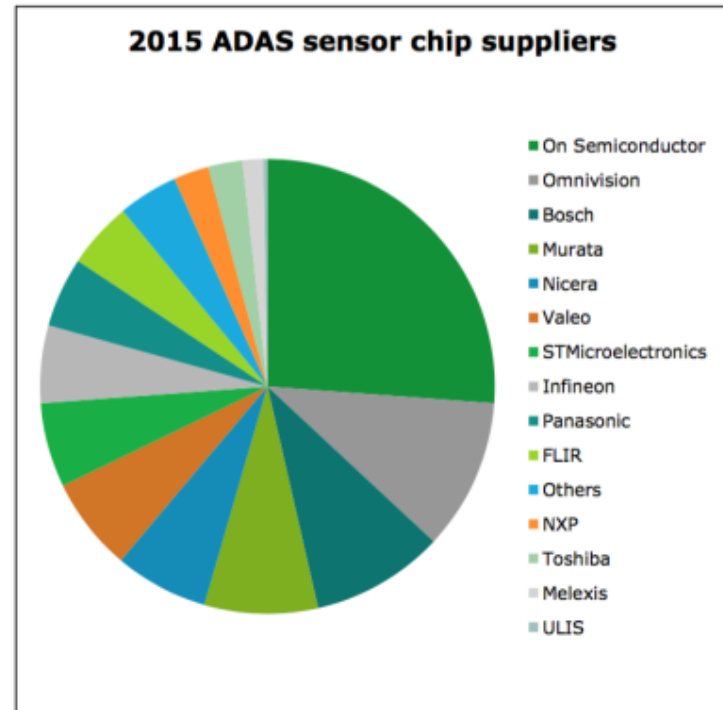
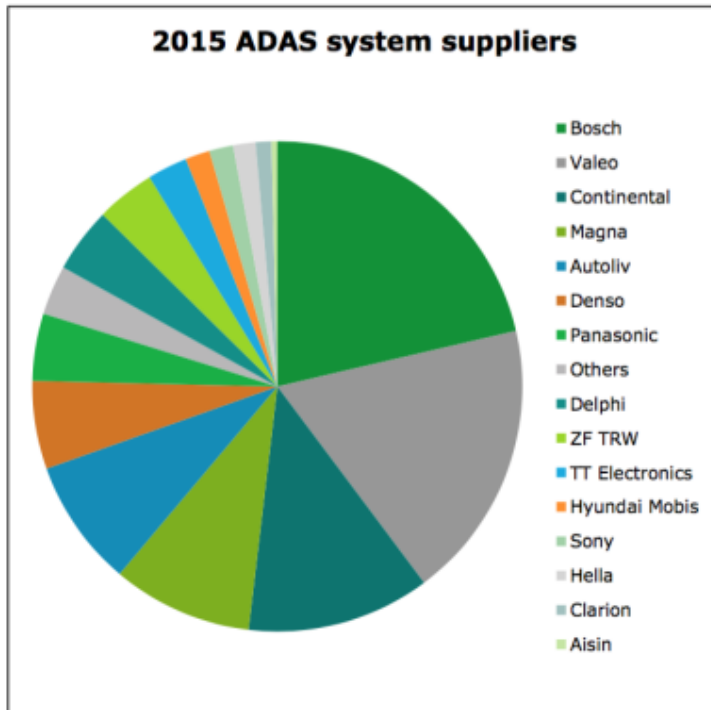
Beyond The Headlights:  
ADAS and Autonomous Sensing

LiDAR = 光學雷達

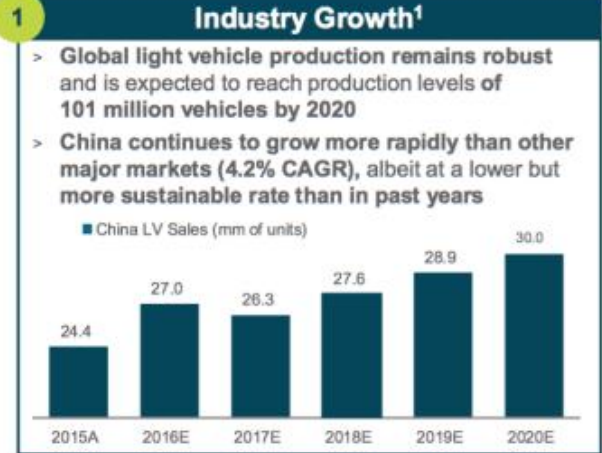
ADAS = 先進駕駛輔助系統

- 多重攝像機應用在汽車使用上
- 雷達，LiDAR和超聲波等新型傳感器正用於增強ADAS功能
- 傳感系統也用於車內監控駕駛分系和汽車安全

- More than 50% of ADAS systems are supplied by 4 companies
- > More than 50% of Sensors supplied in ADAS systems are manufactured by 4 companies with the largest CIS sensor company not in the top 10



\*includes image sensors, radar transceivers, ultrasonic and infrared sensors

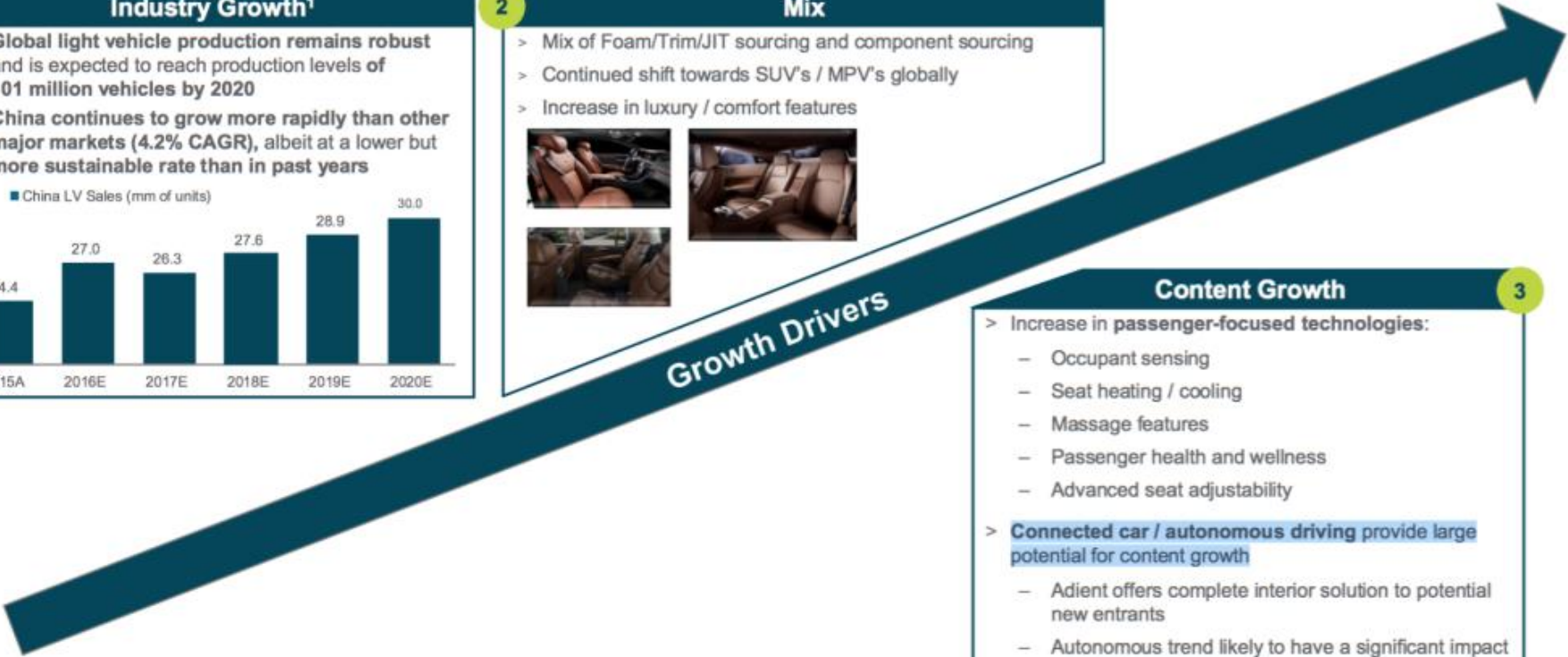


### 2 Mix

- > Mix of Foam/Trim/JIT sourcing and component sourcing
- > Continued shift towards SUV's / MPV's globally
- > Increase in luxury / comfort features

### 3 Content Growth

- > Increase in passenger-focused technologies:
  - Occupant sensing
  - Seat heating / cooling
  - Massage features
  - Passenger health and wellness
  - Advanced seat adjustability
- > Connected car / autonomous driving provide large potential for content growth
  - Adient offers complete interior solution to potential new entrants
  - Autonomous trend likely to have a significant impact on interior content

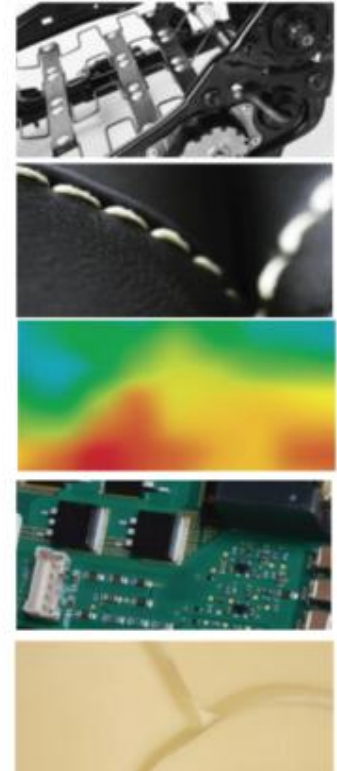


- Seating – growth market



Unique competitive advantage for Lear

	2017 Estimated Market Size	Lear Share
<b>SEAT STRUCTURES</b>	\$19.9B	9%
<b>SEAT COVERS</b>	\$11.6B	17%
Leather ✓	\$3.8B	30%
Fabric	\$2.6B	17%
<b>SEAT COMFORT</b>	\$1.8B	N/A
Heat / Cool ✓	\$1.0B	
Lumbar / Massage	\$0.8B	
<b>SEAT ELECTRONICS</b> ✓	\$2.3B	9%
<b>FOAM</b>	\$6.4B	6%







**Headlamps**



**Signal Lamps**

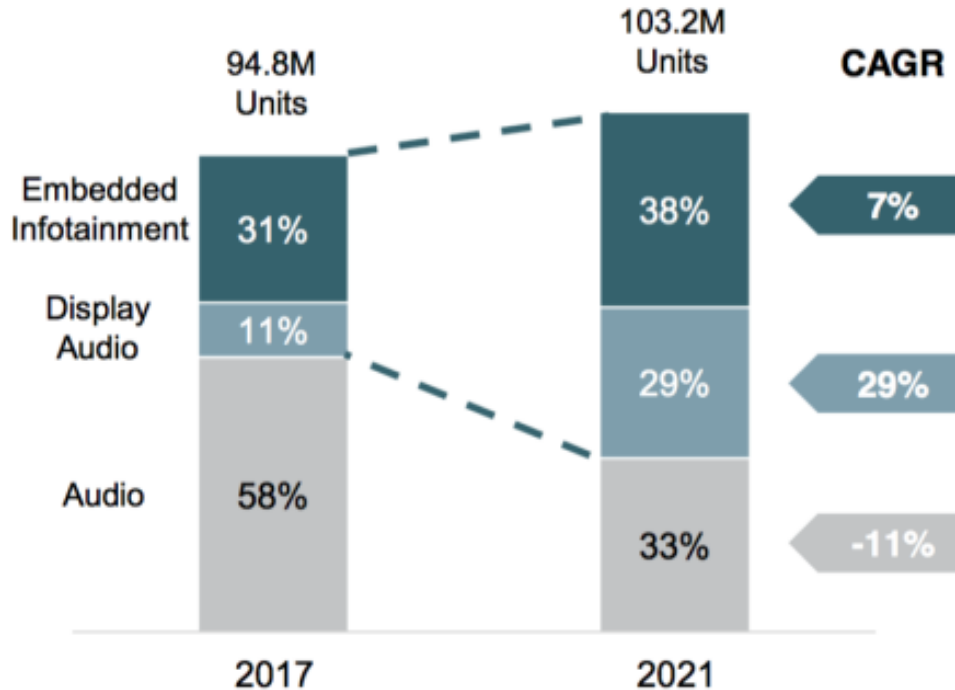


**Electronics**



**2 Wheeler Lighting**

## Audio/Infotainment Market Trends



- 顯示型音響，因為 CarPlay 以及 Android Auto 而成長數度最快
- 預計 HTML5 以及 Android 將成為嵌入式信息娛樂的關鍵技術
- 音頻系統與新興市場息息相關



SmartCore™

- Drives ECU consolidation and reduces cost to OEMs
- First tier 1 to deliver solution launching in early 2018
- Four OEM customers adopting this technology



Infotainment Solutions

- Developer friendly platform using HTML5 enables third-party applications
- AllGo acquisition complements display audio capabilities
- Highly secure and over the air upgradeable



Autonomous Driving

- Open development of AI based autonomous solution
- Complete suite of hardware and software tools for rapid development
- Launch technology platform at CES 2018

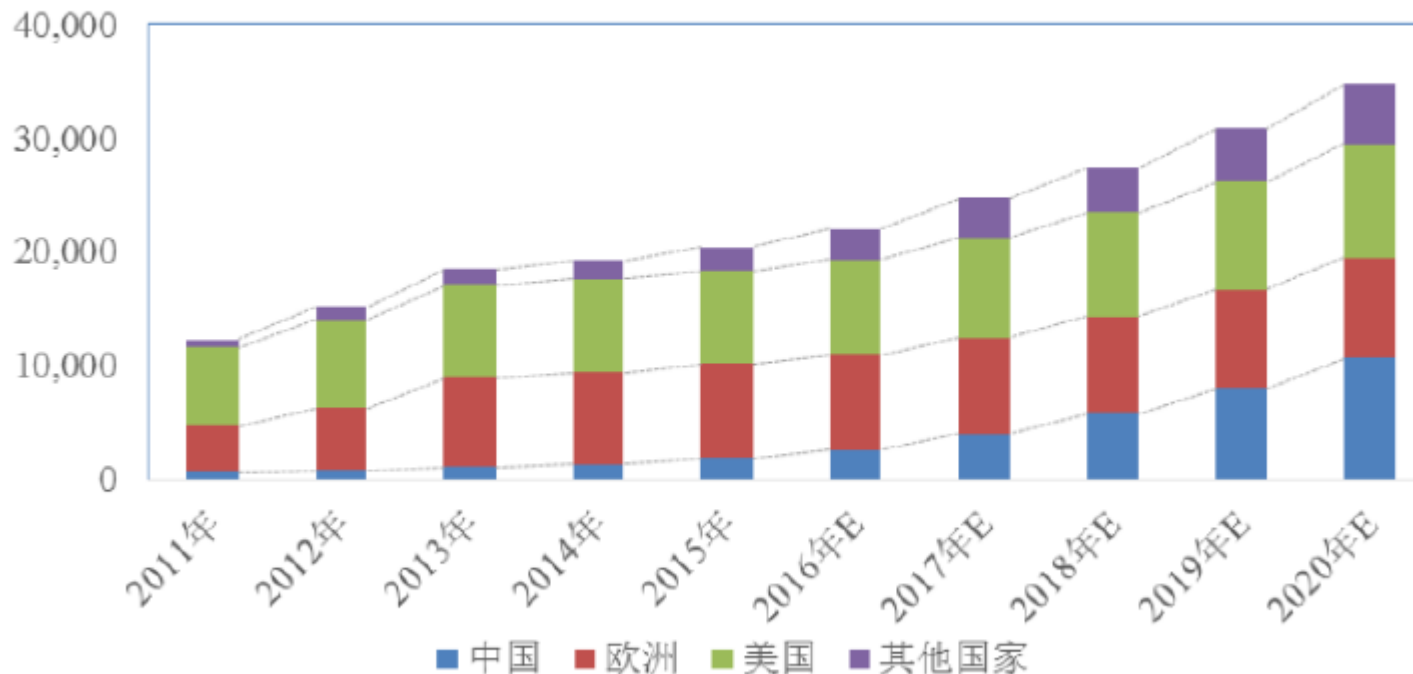




- 胎壓偵測示意圖 Tire pressure monitoring system (TPMS)
- 汽車配給4個胎壓偵測系統

2011-2020年全球及主要国家轻型车TPMS产品OEM市场需求量情况

单位：万个



数据来源：根据 OICA 数据推算

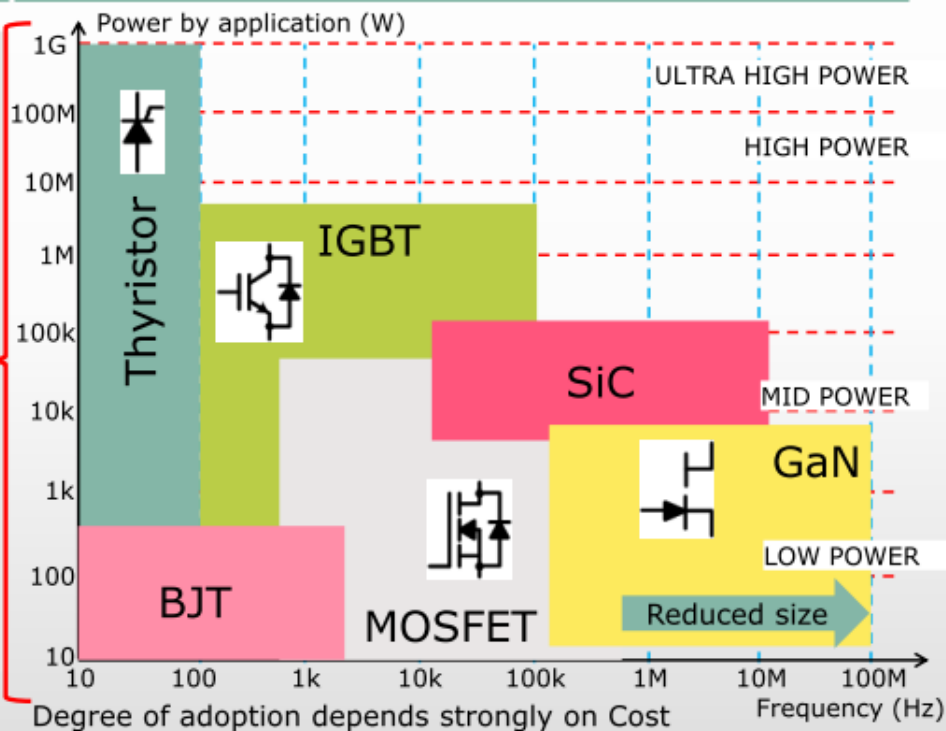
- 據OCIA指出，胎壓偵測系統的出貨量在OEM市場將會達到3.48億個，中國將會是在所有區域裡需求最大的一個

## 研發 & 趨勢

## Application

## Future Scenario Power Electronics

- > HVDC
- > HC-supplier
- > Large drives
- > Ships
- > Locomotives
- > Large solar plants
- > Trams, buses
- > Electric cars
- > On-roof PV
- > Small drives
- > Air conditioner
- > Robotics
- > Washing machine
- > SMPS
- > Chargers/Adapters



## Report covers































- IGBTs
- MOSFETs
- GaN
- SiC
- Controllers
- Passives

## Detailed discussion of

- Market Drivers
- Key Metrics
- Trends
- Challenges

	分類	產品應用
汽車		混合電力及電動車電力總成和充電器
工業品		航空電子和海洋推進， 重型車輛， 感應加熱， 焊接
不斷電系統		數據中心， 醫院， 行業
馬達系統		商用電機驅動， 工業應用（ 風機， 暖通空調， 泵... ）
消費品		相機， 消費者， 照明， 白色家電...
光伏,軌道, 風力		逆變器， 微逆變器 火車， 地鐵和地鐵動力總成

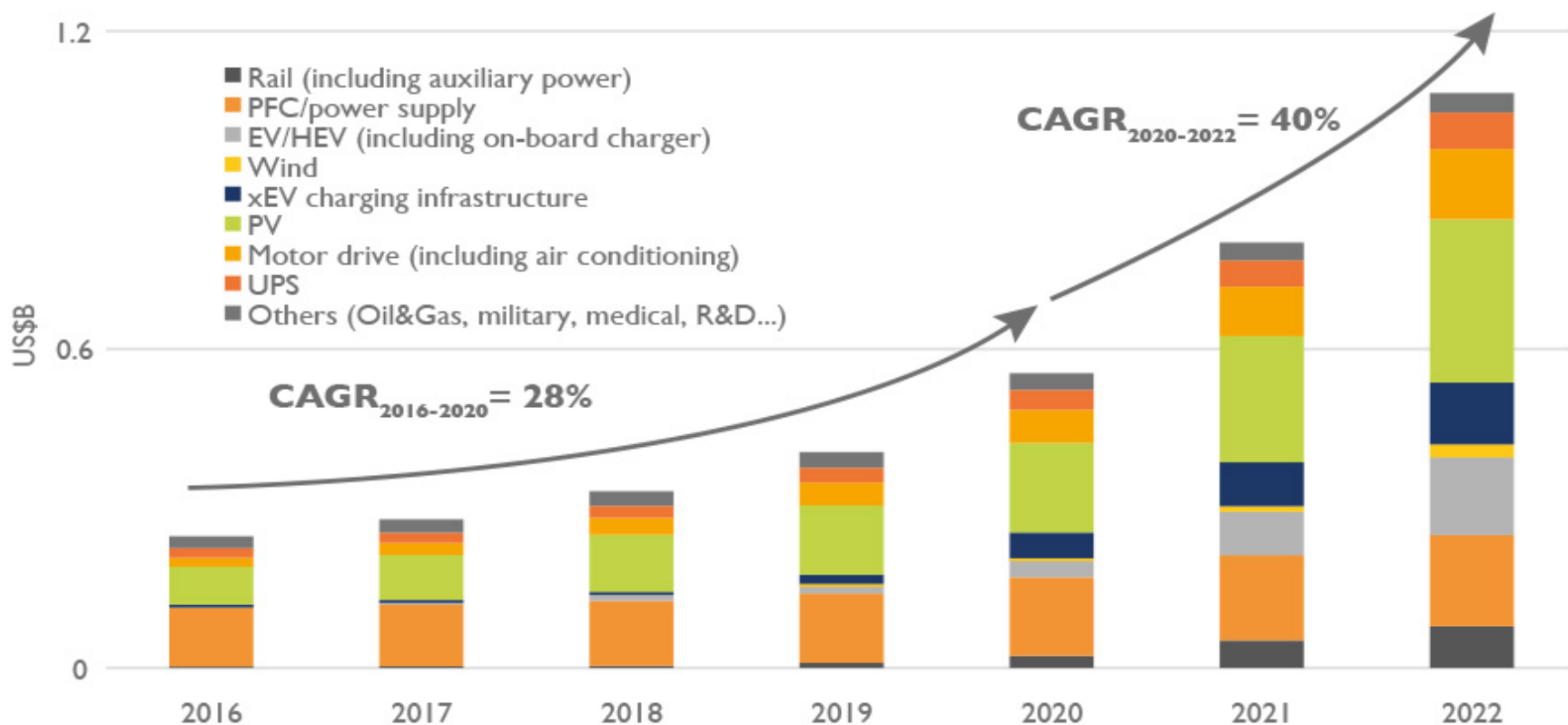
## IGBT製造商排名(依伏特數)

	No.1	No.2	No.3	No.4	No.5
400V and Less			 Leading Innovation >>>	 life.augmented	
600-650V					 life.augmented
1200V					 life.augmented
1700V					
2500V-3300V					
4500V and More					

- IGBT器件行業正在改變，隨著電動汽車市場的成長，電源模組正在成為價值鏈中的關鍵部分；2013年以后，中國市場約占全球IGBT器件市場的三分之一，中國市場為強茂未來重點發展對象

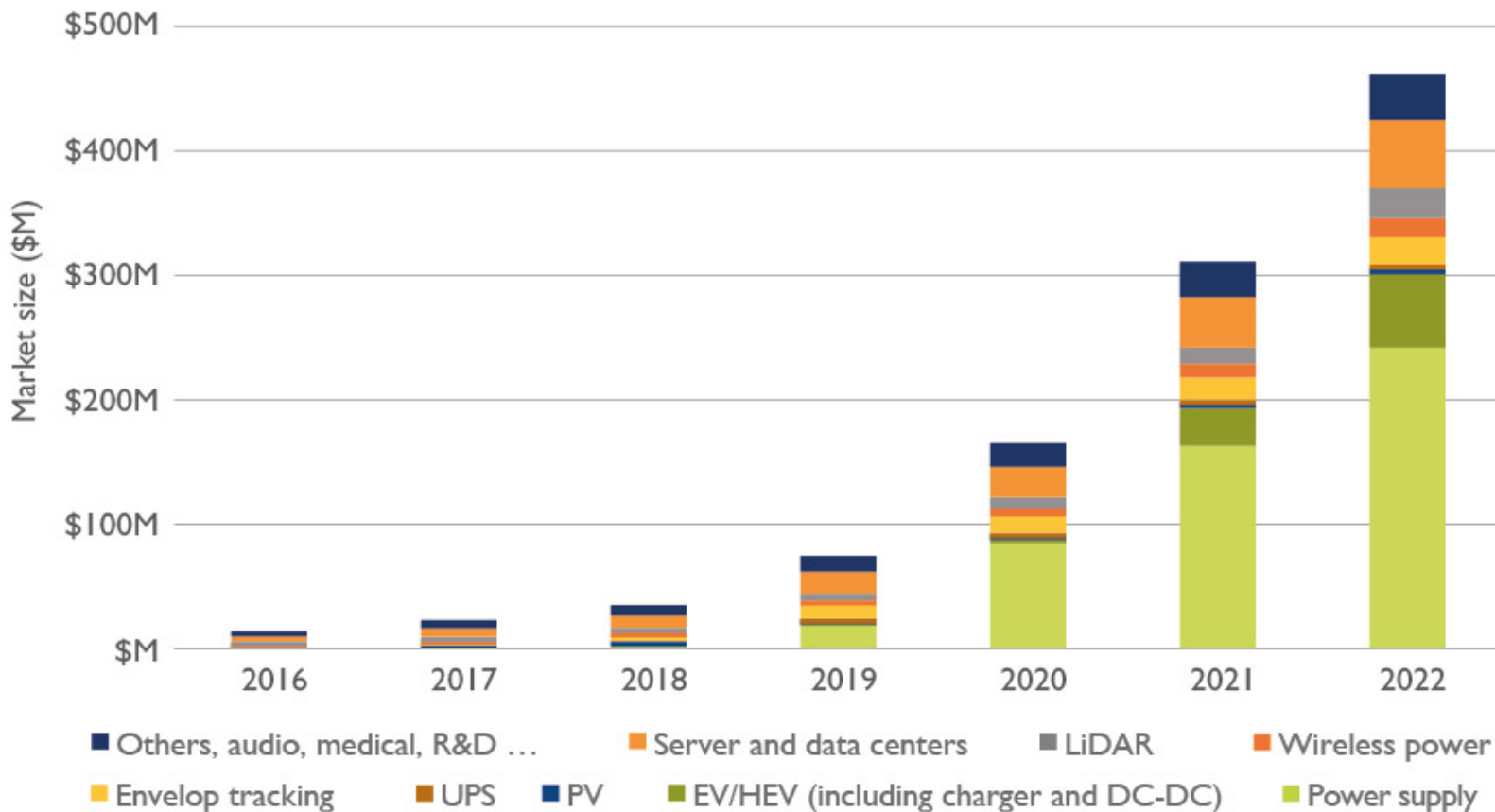
## SiC device market size split by application

(Source: Power SiC: Materials, Devices, Modules, and Applications report, Yole Développement, August 2017)



## GaN power device market size split by application (\$M)

(Source: Power GaN 2017: Epitaxy, Devices, Applications, and Technology Trends 2017 report, Yole Développement, October 2017)





# Questions & Answers

