CAPITAL MARKETS DAY 2020
INSIGHTS BONDER

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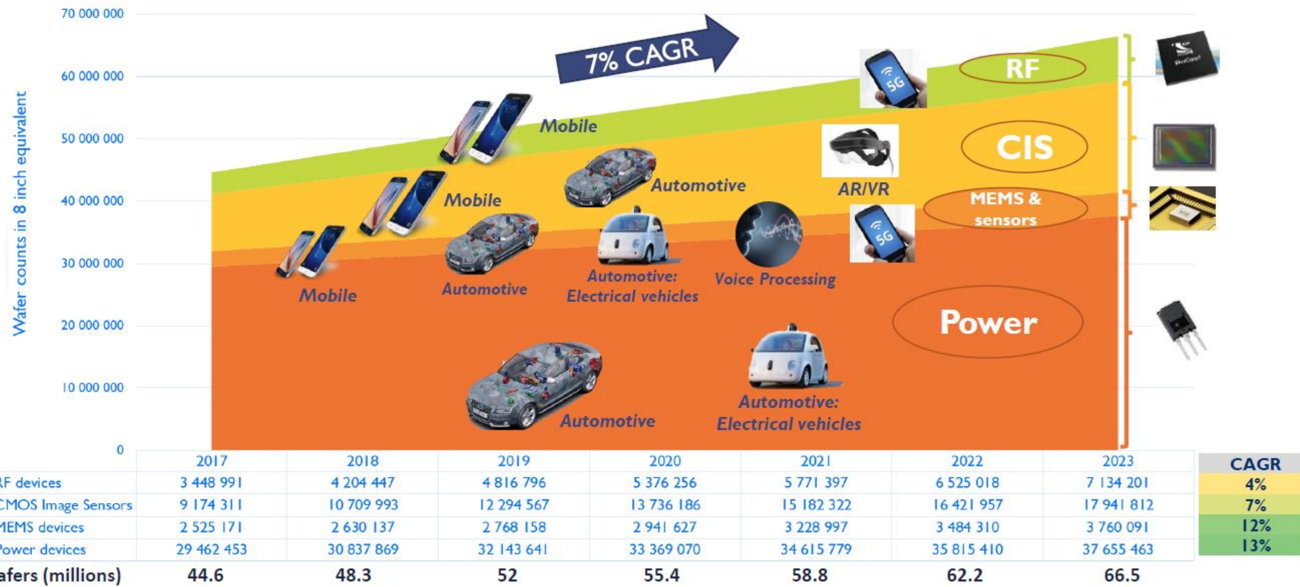
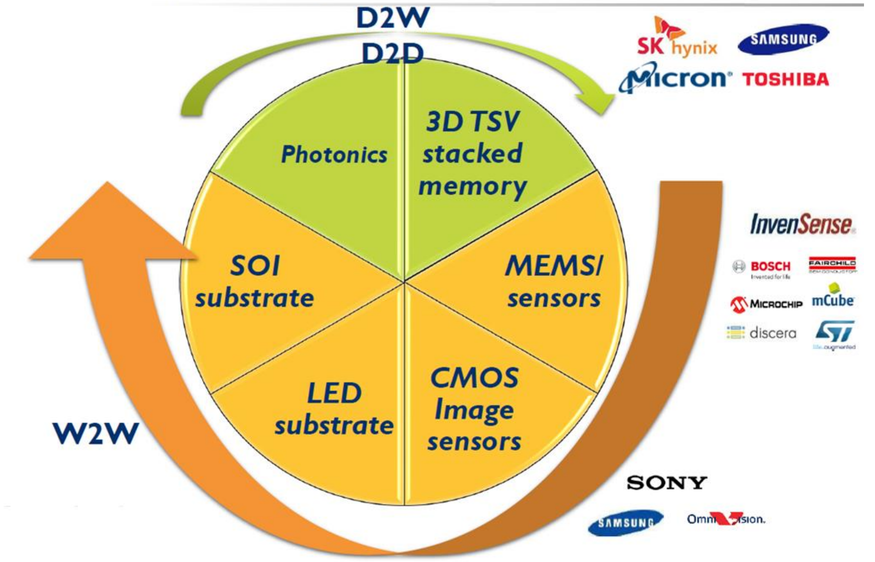
MORE THAN MOORE MARKET AND TECHNOLOGY TRENDS – APPLICATION DRIVERS FOR WAFER BONDING

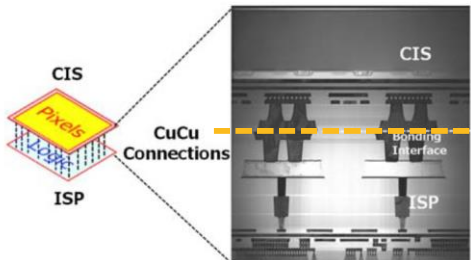
- Demand for “More than Moore” devices is expected at CAGR (2017-23) of 4 - 13% by Yole Développement
- Wafer to Wafer (W2W) and Die to Wafer (D2W) bonding is required in many of these applications – see examples below



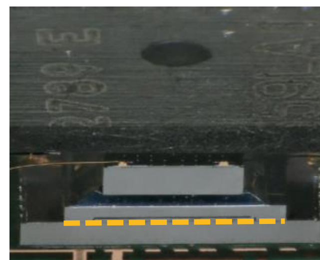
	2017	2018	2019	2020	2021	2022	2023	CAGR
RF devices	3 448 991	4 204 447	4 816 796	5 376 256	5 771 397	6 525 018	7 134 201	4%
CMOS Image Sensors	9 174 311	10 709 993	12 294 567	13 736 186	15 182 322	16 421 957	17 941 812	7%
MEMS devices	2 525 171	2 630 137	2 768 158	2 941 627	3 228 997	3 484 310	3 760 091	12%
Power devices	29 462 453	30 837 869	32 143 641	33 369 070	34 615 779	35 815 410	37 655 463	13%
TOT wafers (millions)	44.6	48.3	52	55.4	58.8	62.2	66.5	

Source: Yole (2018, 2019)

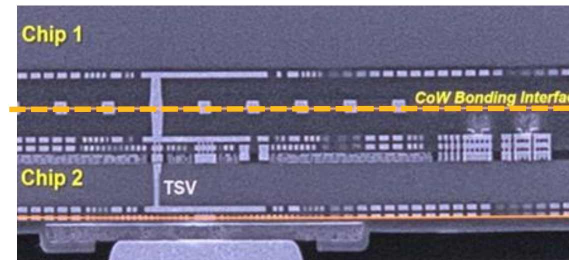




Sony CMOS Image Sensor (CIS)
Source: Sony (2019)



InvenSense 7-axis MEMS
Source: SystemPlus (2017)



Bonding Interface

tsmc SoIC™ chip with 4µm TSVs and pitch of 9µm
Source: Techsearch (2020)

MORE THAN MOORE MARKET AND TECHNOLOGY TRENDS – 2.5D AND 3D STACKING TECHNOLOGY

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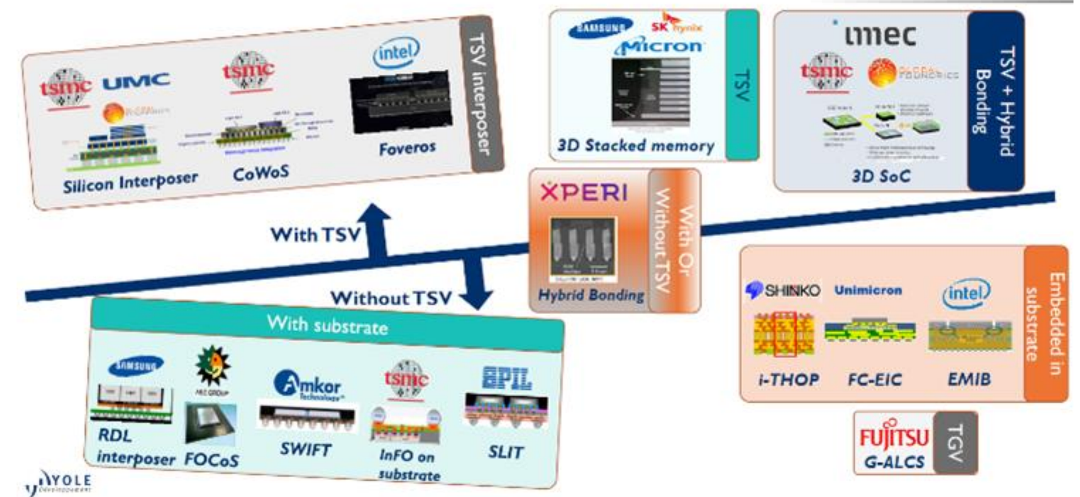
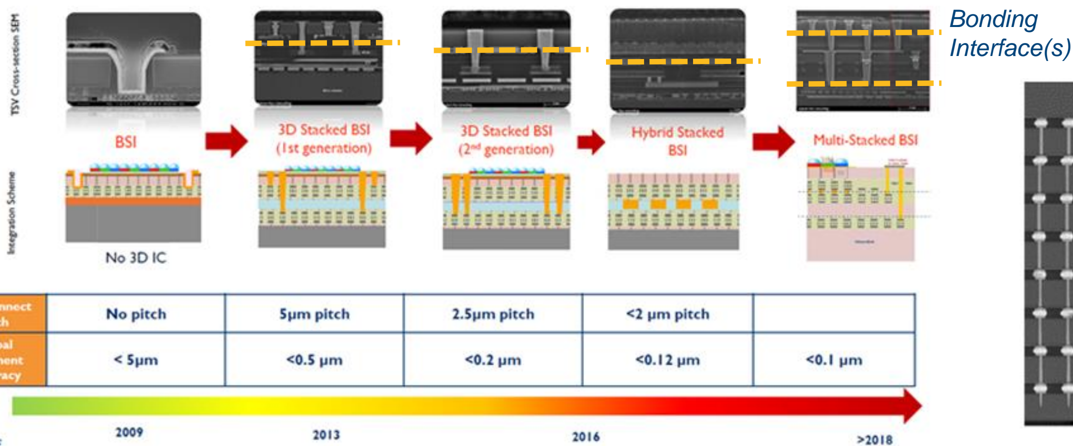
+ 2.5D and 3D requires temporary bonding for wafer thinning as well as D2W or W2W bonding
+ D2W bonding enables heterogeneous integration, high yield is achieved by stacking known good dies (KGD)
+ Hybrid bonding will be the main enabler for pitch scaling (TSV and µbump → Cu/Cu interconnects = hybrid bonding)
  - Used for latest generations of CMOS image sensors since 2017
  - Will be used for other new 3D devices by IDMs and foundries
+ Equipment market is forecasted at CAGR (2018-25) of ~25% by Yole Développement

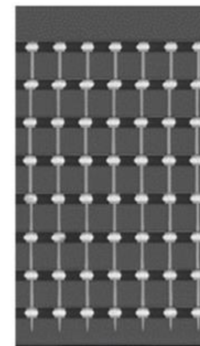


Source: Yole (2018)

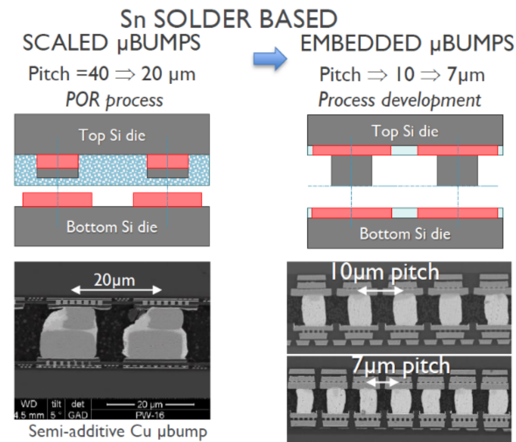


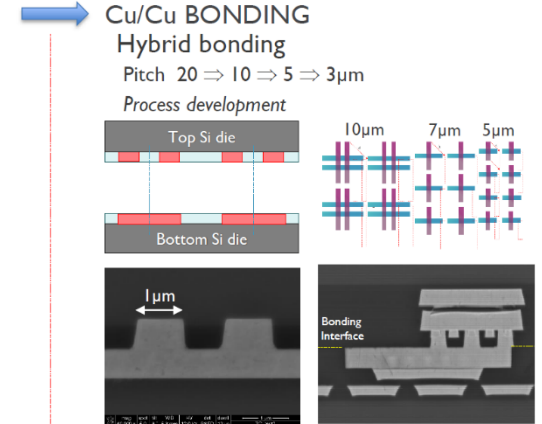
Bonding Interface(s)

Source: Yole (2018)



8GB HBM2 (3D memory)
Source: Samsung

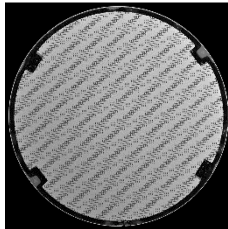
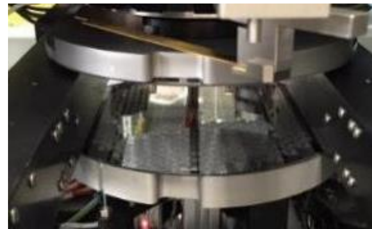
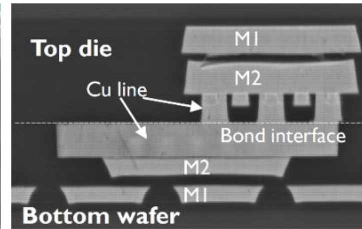
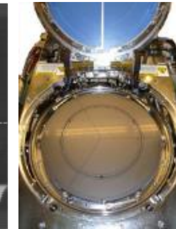
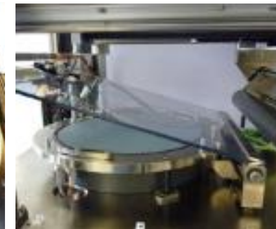
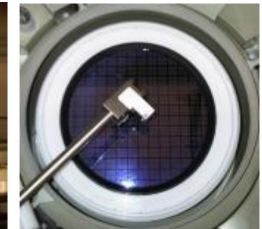




Source: imec (2020)

PRODUCT PORTFOLIO

Business Unit Bonder

More than Moore – MEMS and related			More than Moore - 2.5D and 3D				
							

	Semi-Automated Bonders		Automated Permanent Bonders		Automated Temporary Bonders, Debonders and Cleaners	
	SB6/8 Gen2 (20kN)	XB8 (100kN)	XBS200 W2W Bonder	XBS300 W2W / collective D2W Bonder	XBS300 Temporary Bonder	XBC300 Gen2 Debonder (mechanical / laser) and Cleaner
Comment / USP	▪ Large installed base ▪ Supports all traditional processes	Supports new high force / high end processes	Fixture-less aligned wafer handling for best cost of ownership	<100nm overlay to support pitch scaling trend in hybrid bonding	▪ Large installed base with ~40-50%[1] market share for 2.5D and 3D memory ▪ Technology enabler applications such as CIS, FO-WLP ▪ Started transition from mechanical- to laser debonding for next generation of devices	

1) SUSS internal estimation

GROWTH POTENTIAL
– ON TRACK WITH SUSS STRATEGY 2025 PROJECTION

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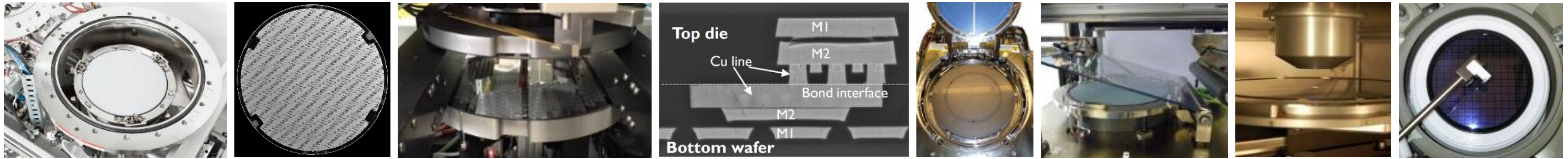

Sales Revenue Bonder Equipment €M – most likely scenario

100
90
80
70
60
50
40
30
20
10
0

CAGR ~27%

2017 Act
2018 Act
2019 Act
2020 projected
2021
2022
2023
2024
2025 target

Permanent Bonding (up to 200mm)
Temporary Bonding (300mm)
Hybrid Bonding (300mm)

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