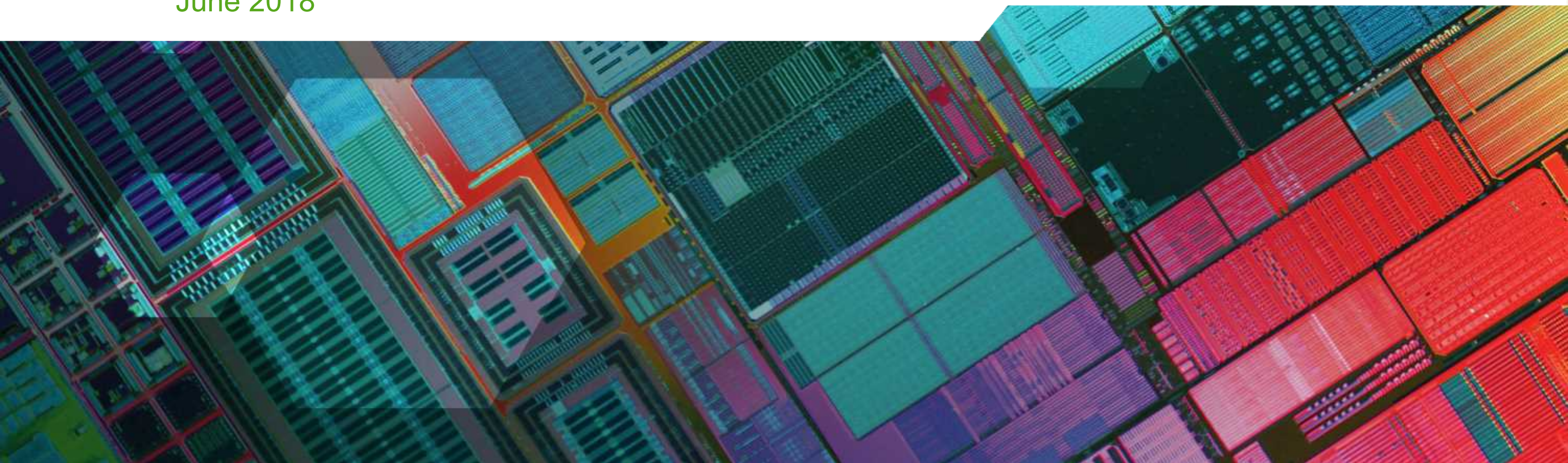




中国の半導体設備投資に関する展望

Shanshan Du
Senior Analyst
SEMI China
June 2018



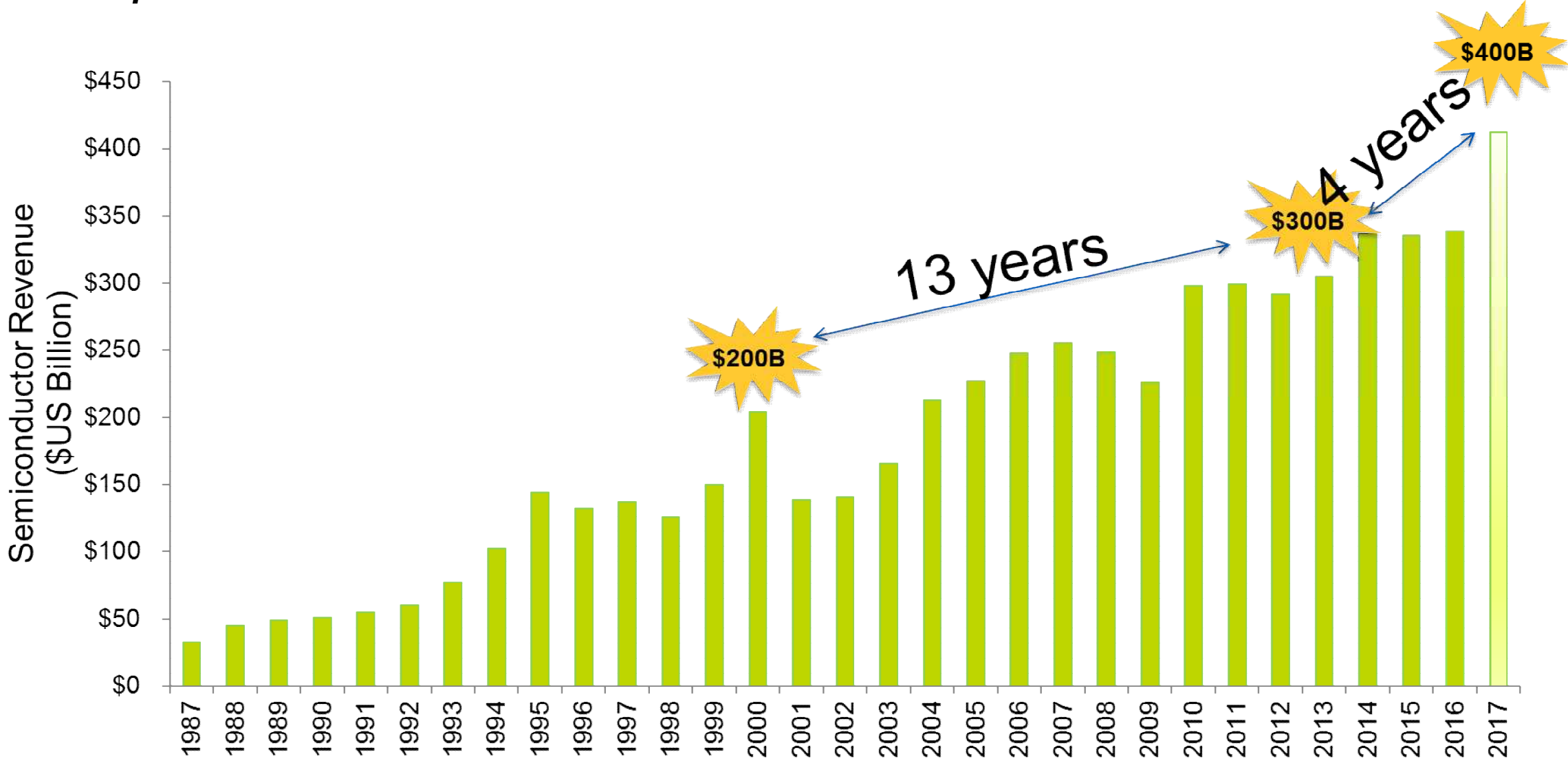
Outline

- 2018 Outlook and Drivers
- Fab Investment Outlook
 - Record spending
- The Surge of China
 - New fab projects
 - Capacity projection
 - Memory and Foundry
- Summary

2018 Outlook and Drivers

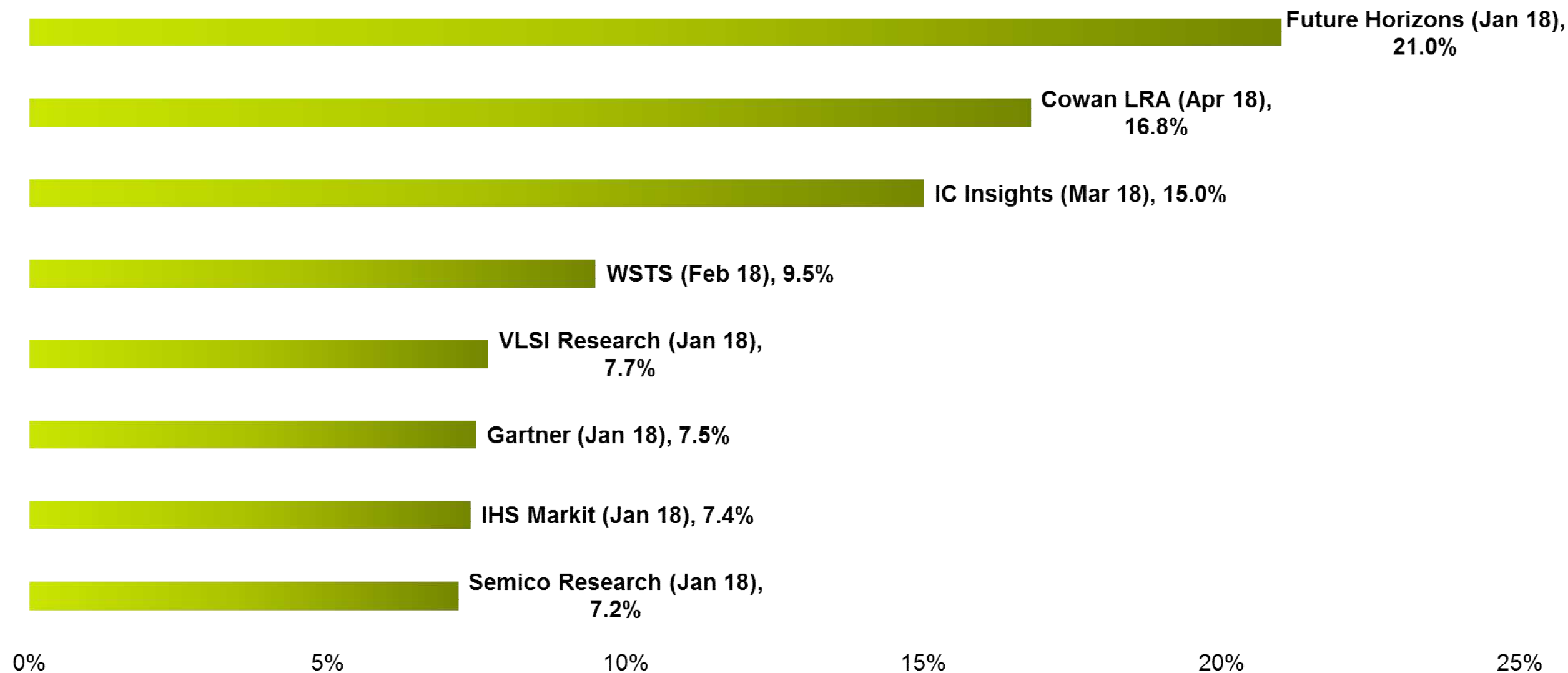
半導体業界の見通し

2017 soars past \$400 billion



Source: SIA/WSTS historical year end reports, WSTS 2018 Forecast

2018 半導體預測



Source: SEMI April 2018

業界動向と成長ドライバー

- Numerous Applications Driving Growth Through 2025



- Robust volume shipments and higher ASPs for Memory are driving strong 2017 revenue growth.
- Storage, industrial, wireless, and automotive applications also contributing to strong 2017 growth.
- Connectivity, data centers, communications, automotive, and advanced software spurs strong demand through 2025.

Source: SEMI Industry Strategy Symposium, 2017

* Semiconductor value
** Network/Devices
*** Market Size

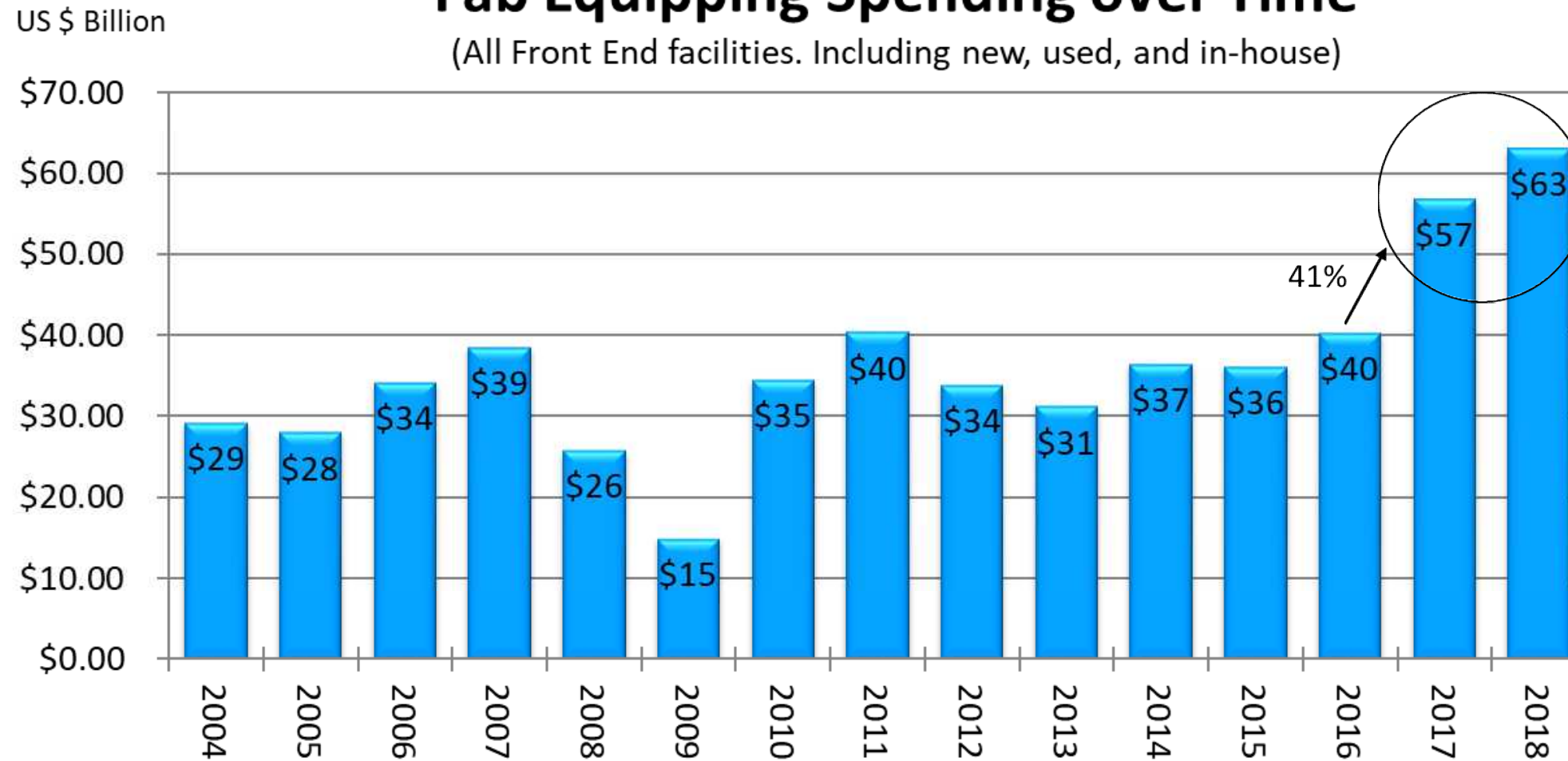
Virtual Reality (VR)
Augmented Reality (AR)
AI Artificial Intelligence (AI)

Global Fab Investment Outlook

2017年に40%増加

Fab Equipping Spending over Time

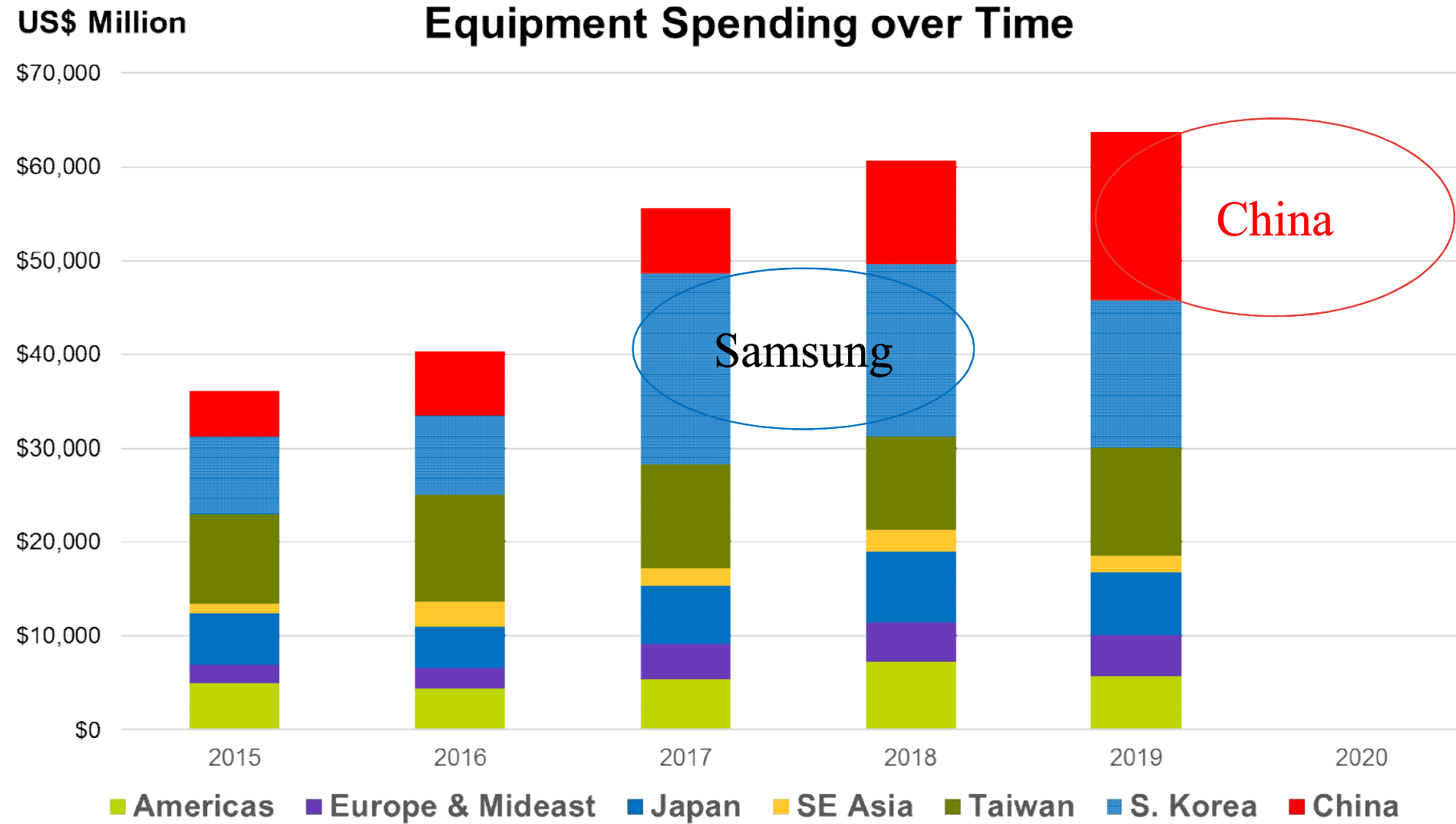
(All Front End facilities. Including new, used, and in-house)



World Fab Forecast, December 2017, SEMI

設備投資

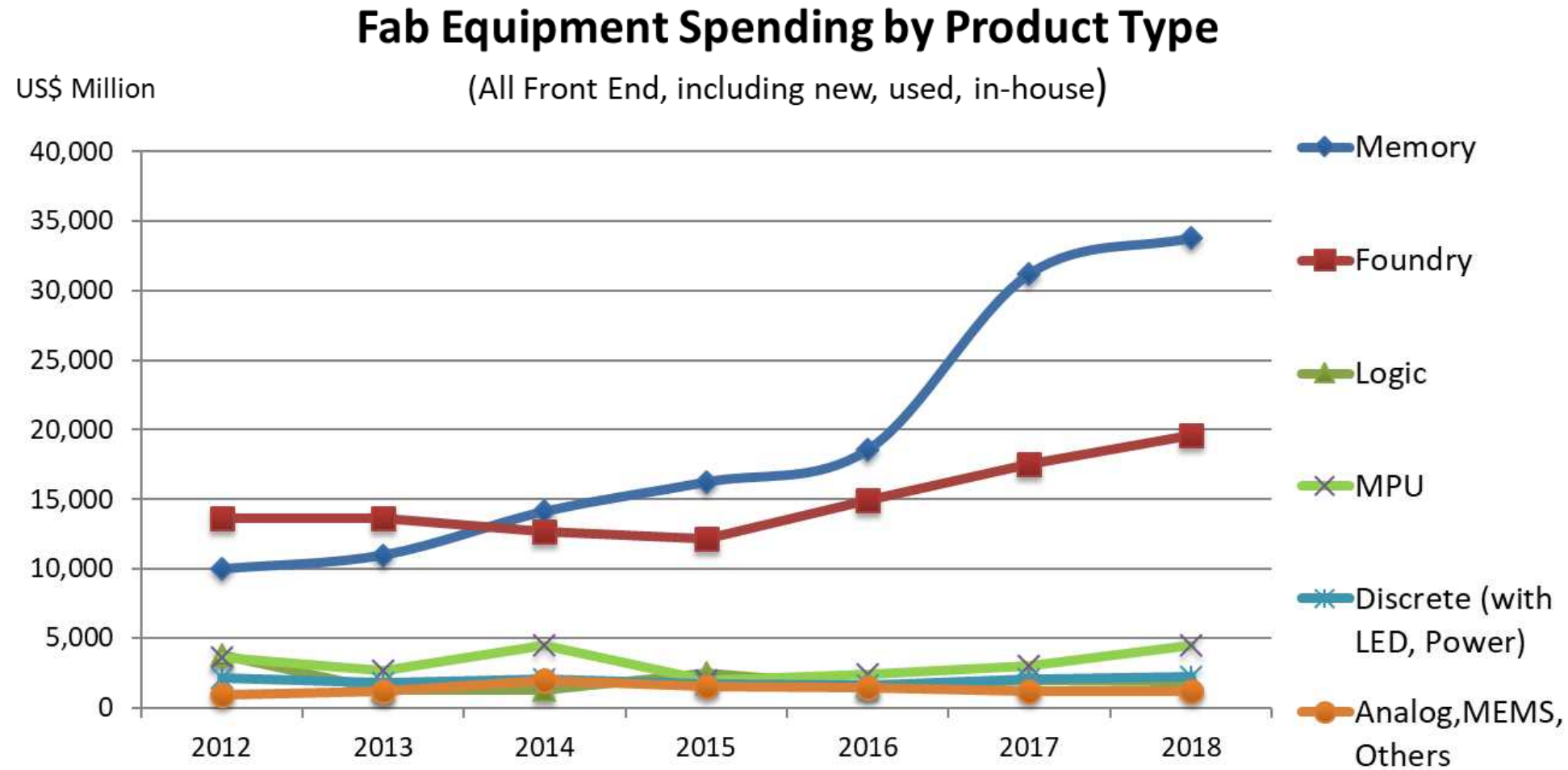
Growth is likely to continue beyond this year



Source: SEMI World Fab Forecast, March 2018

製品タイプ別設備投資

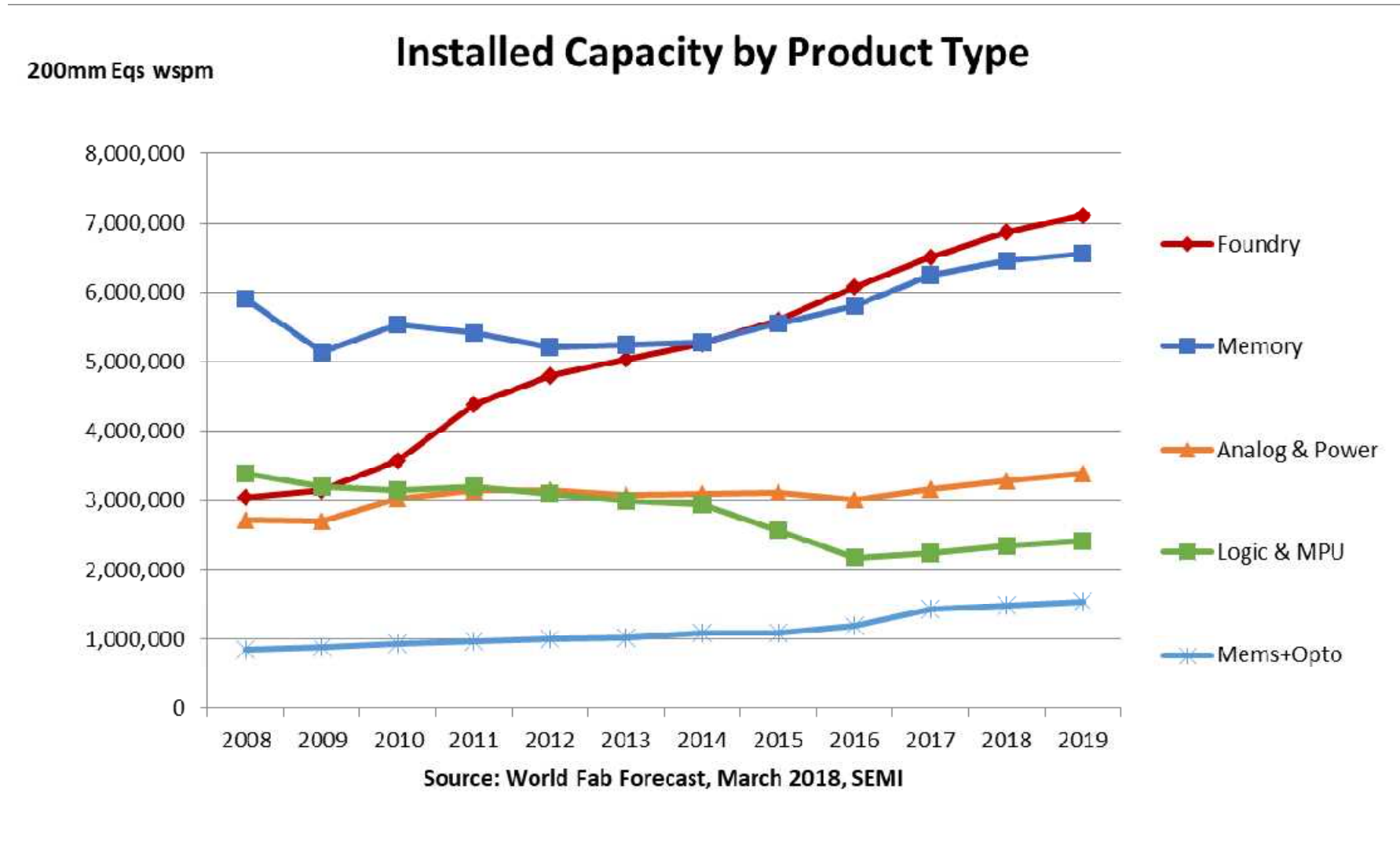
Led by Memory and Foundry



Source: World Fab Forecast reports, December 2017, SEMI

製品タイプ別容量推移

3D NAND, DRAM, Foundry and MEMS add more new capacity



Type	2018	2019
3D NAND	46%	20%
DRAM	5.5%	5.7%
MEMS	7.8%	3.8%
Foundry	5.4%	3.5%
Analog & Power	4.1%	3%
Logic & MPU	4.5%	3%

China Investment

中国国内 IC 産業

Undergoing Dramatic Growth

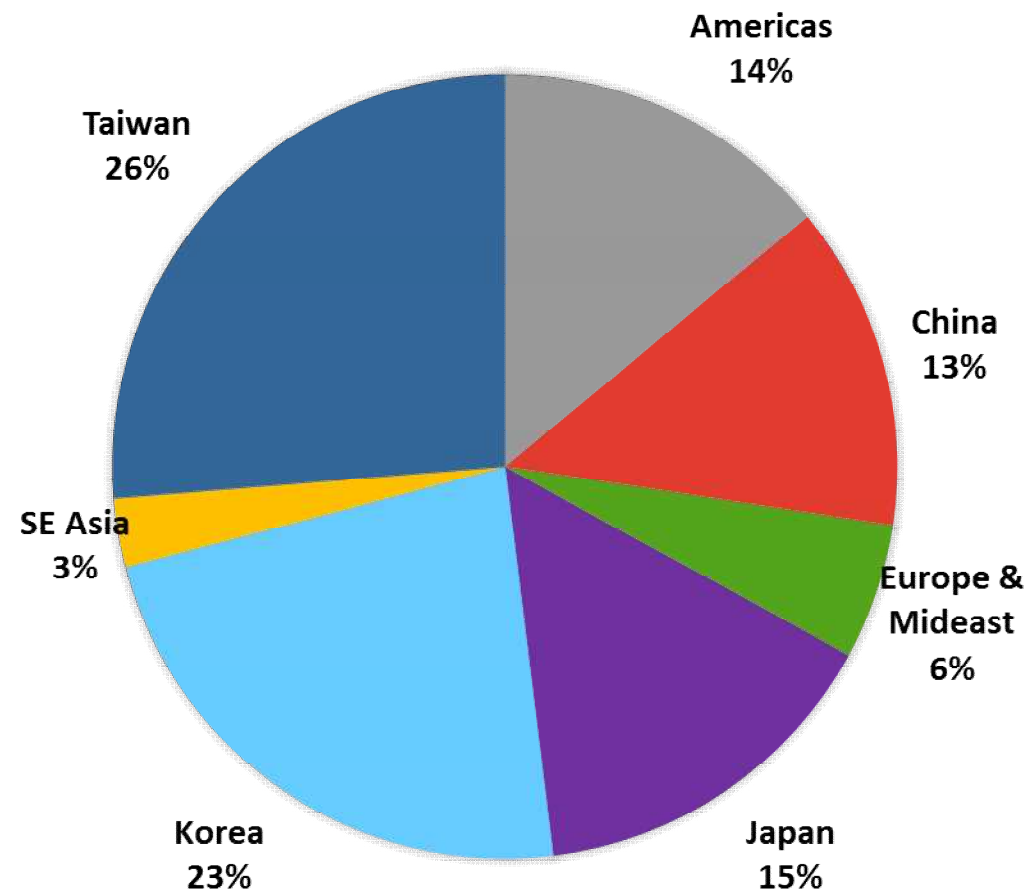


- **Total revenue reached \$83.1B**
- **YtY growth rate is 27%**

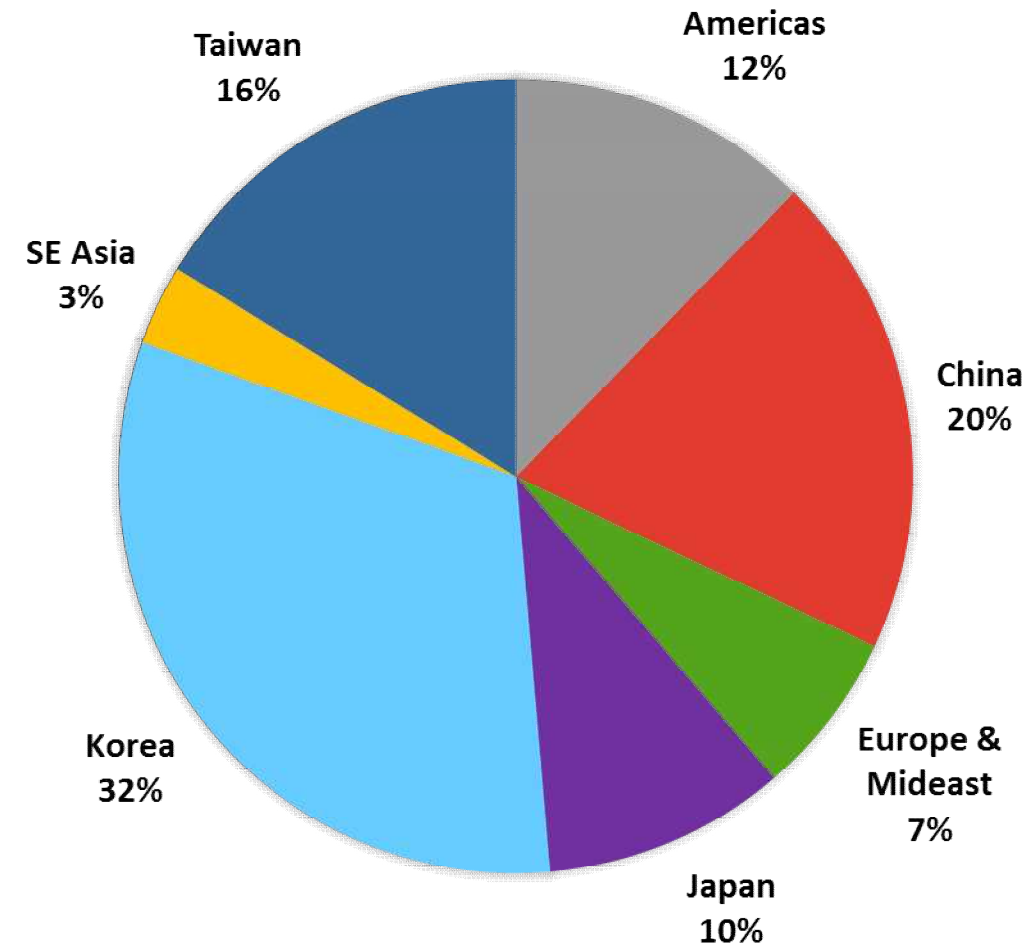
地域別製造装置の支出

China to become Top 2 Spender in 2018/2019

2015 FAB EQUIPMENT SPENDING
US\$36 BILLION



2018 FAB EQUIPMENT SPENDING
US\$63 BILLION

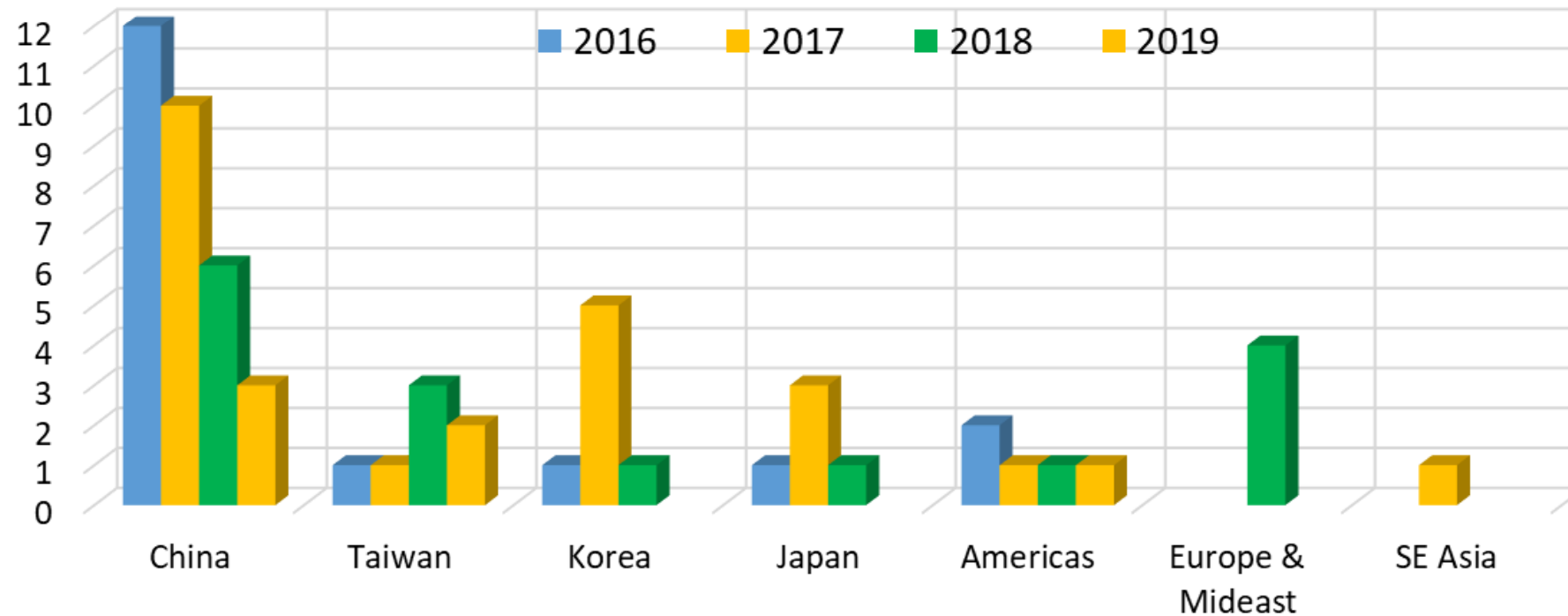


Source: SEMI World Fab Forecast, December 2017

新規工場設置計画 – 中国市場がリード

New Facilities & Lines Starting Construction

(Front End, all probabilities, excluding LED, EPI, R&D)

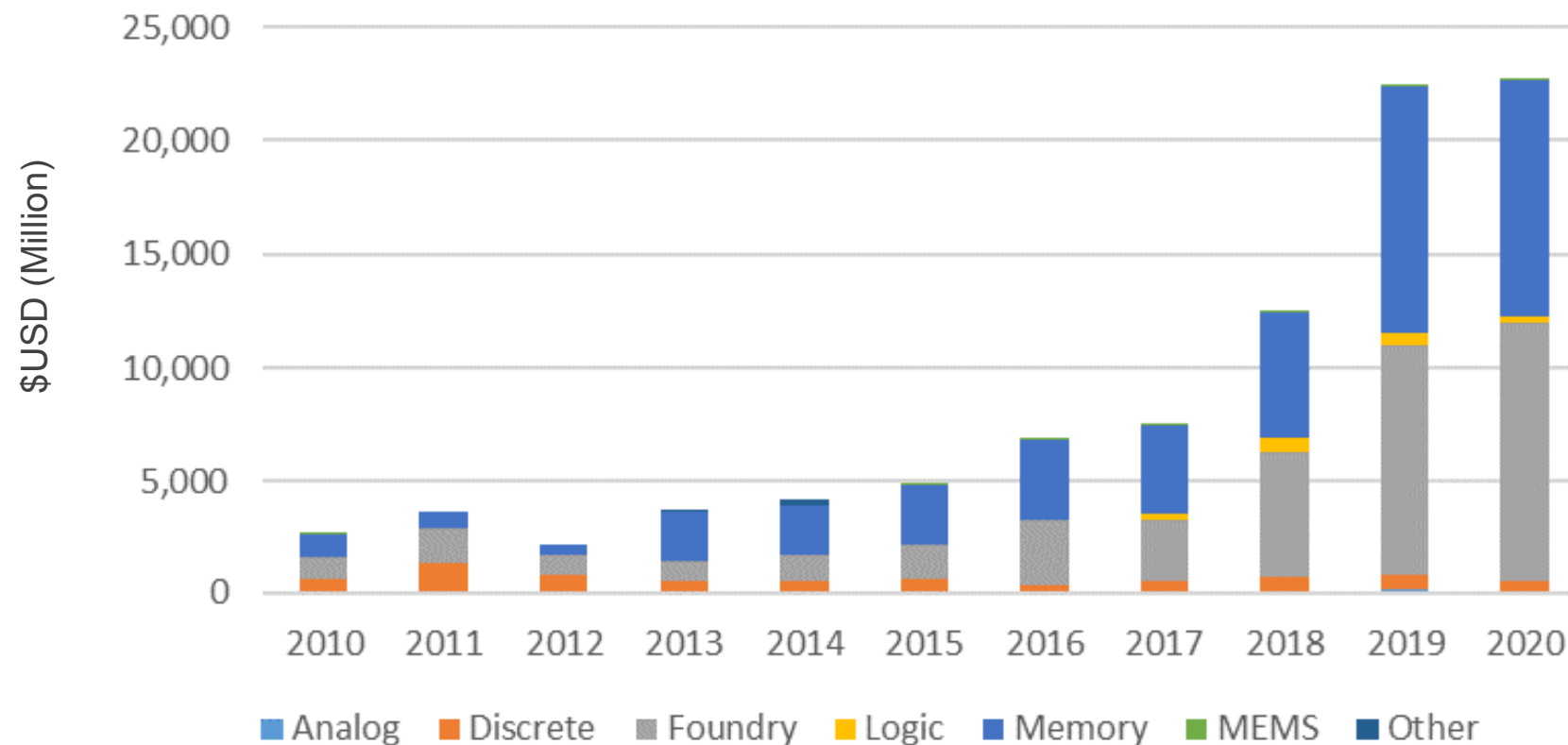


Source: World Fab Forecast report (December 2017, SEMI)

- **19 new fab projects in China from 2017 on**
- **Out of 10 upcoming 300mm projects in China, Majority (7) are from China-owned entities**

中国ファブ投資が急増 – ファウンドリー & メモリーがリード

China Fab Spending by Product Type



Source: SEMI World Fab Forecast, December 2017

Key Spending Projects

2017

- Intel Fab 68 - *upgrade to 3D NAND*
- SK Hynix C2
- UMC Fab 12X
- SMIC B2

2018

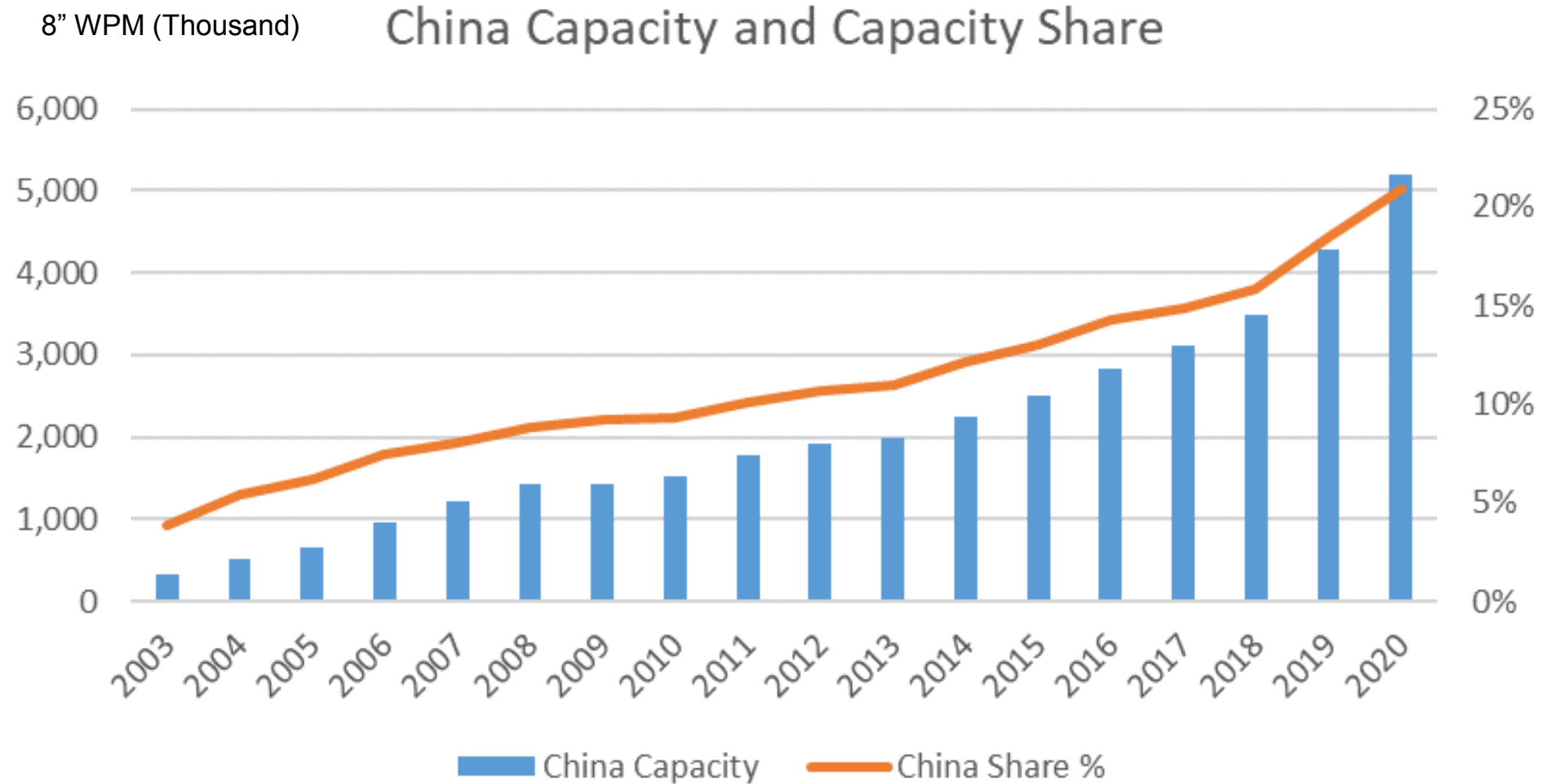
- Intel Fab 68 Phase 2
- Yangtze Memory Technology (Wuhan)
- TSMC Nanjing Phase 1
- Globalfoundries Chengdu Fab 11
- Hua Li Micro Fab 2
- Fujian Jin Hua - DRAM

2019/2020

- Tsinghua Unigroup (Nanjing) and Samsung Xian phase 2
- SK Hynix C3
- SMIC new Shanghai fab
- Hefei Chang Xin Memory

中国の生産能力のシェア増加

Strong growth from 2016 to 2020

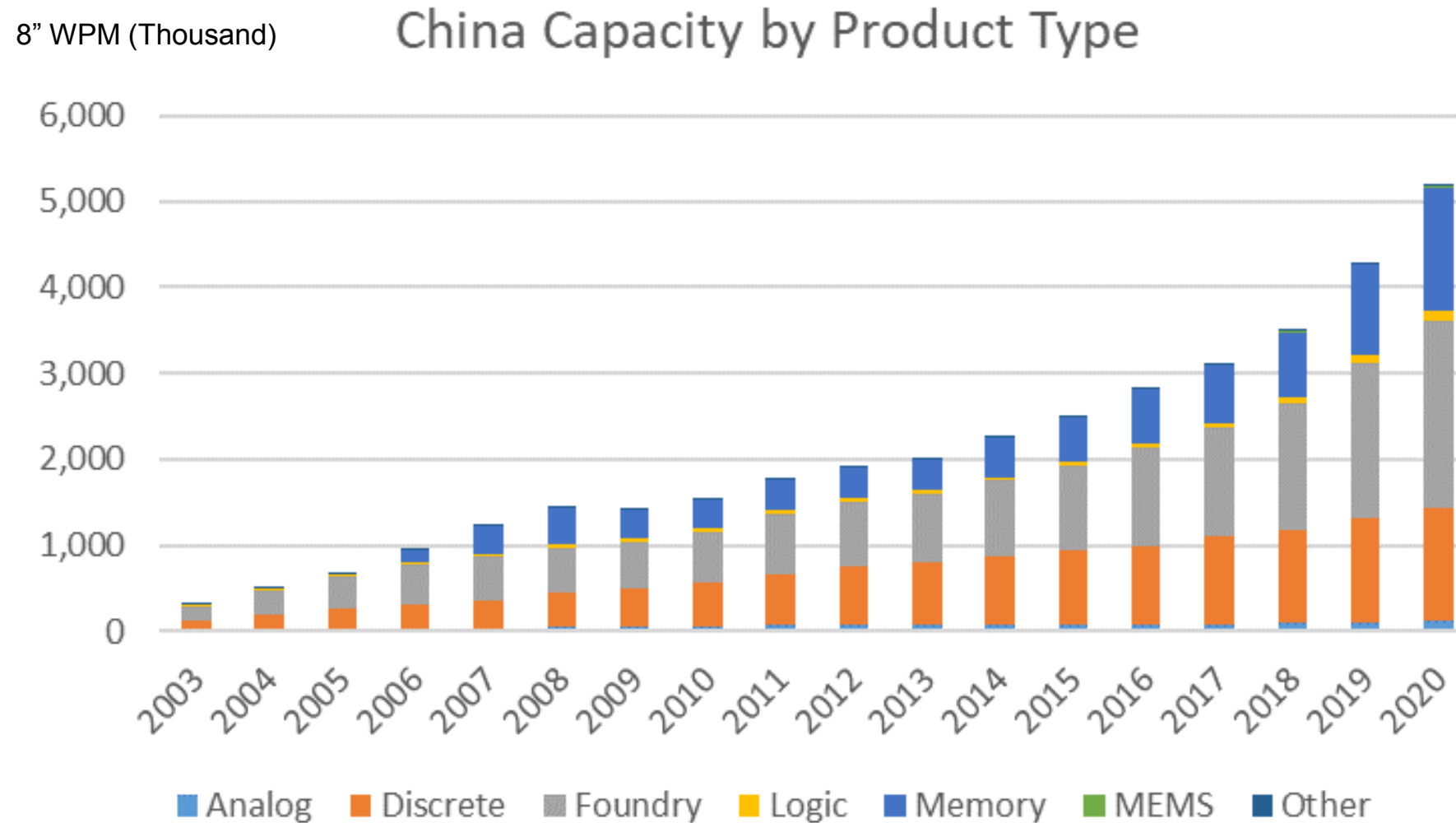


Disclaimer: The forecast is based on current announcement and is subject to change depending on actual execution.

Source: SEMI World Fab Forecast, December 2017

中国の生産能力の推移

Foundry, Memory and Discrete (LED) Fuel the Growth

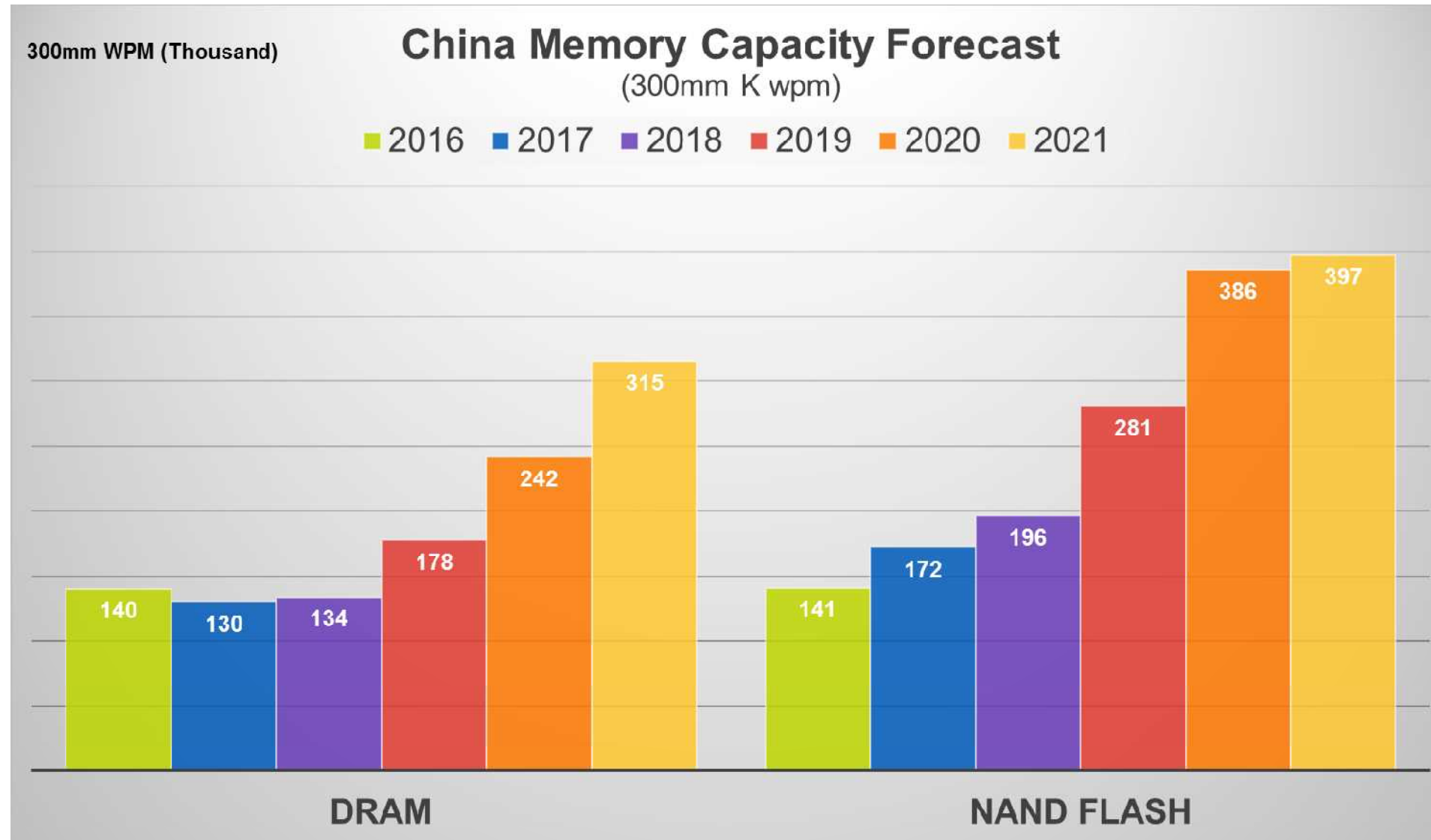


Disclaimer: The forecast is based on current announcement and is subject to change depending on actual execution.

Source: SEMI World Fab Forecast, December 2017

中国のメモリー容量

3D NAND showing stronger momentum



Disclaimer: The forecast is based on current announcement and is subject to change depending on actual execution.

Source: SEMI World Fab Forecast, December 2017

China Momentum and Challenges

Momentum

- The surge of China investment is both policy-driven and market-driven.
- Policies such as the National IC promotion Guidelines (2014) as well as the 13th five-year plan (2016-2020) are the key drivers of the new fab projects blossoms across the country.
- Majority of these new fab projects are supported or “invested” by National IC fund and various local government funds.
- The huge demand and rising Chinese electronics OEMs also play an important role in attracting foreign semiconductor companies to set up facilities in China.

China Momentum and Challenges

Challenges

- There is no shortage of capital for semiconductor fab projects in China. Though some local government funds are not really ready yet.
- Two major limiting factors are the availability of talent and the sources of technologies/IP.
- Talent sourcing is happening across Asia especially from Korea, Taiwan and Japan.
- However, talent recruiting raises some concerns about IP infringement especially in memory.
- The concerns of adding massive capacity in certain product categories may trigger oversupply in the long run.
- China faces regulatory challenges to successfully complete outbound M&A in tech sectors.

Summary

Summary

Fab Investment

- Record spending in 2017 and 2018
- 3D NAND, DRAM, Foundry and China investments are key drivers to spending

The Surge of China

- 19 new projects planned from 2017 onwards.
- China is forecasted to become the largest capital equipment market in 2019
- Investment in foundry and memory segments are paving the way for China's place on the global semiconductor stage.

China IC Industry Outlook

POLICIES – ECOSYSTEM – INVESTMENTS - CAPACITIES

- New Expanded Edition Coming in September, 2018
- Segmented Market Details
- Supply Chain Database
- Forward Analysis with
- Opportunities and Challenges

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