

Presentation to NDIA

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Semiconductor Industry Association

Building America's Innovation Economy



www.semiconductors.org


Importance of U.S. semiconductor industry



BRAINS OF MODERN ELECTRONICS, strategic to America's innovation infrastructure



About **HALF OF GLOBAL MARKET** share with sales of more than **\$209 BILLION**



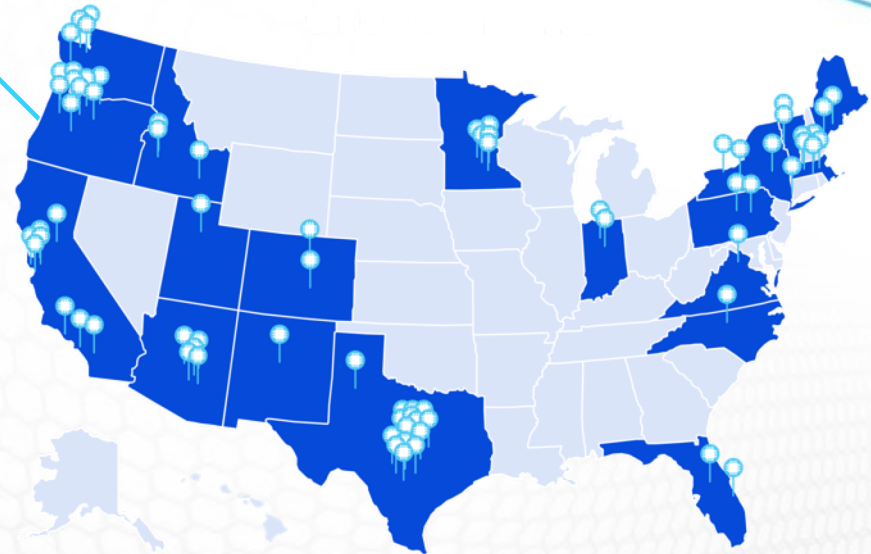
Invests about **ONE-FIFTH OF REVENUE** in R&D, among the highest of any industry, concentrated in the U.S.

Among the world's **MOST ADVANCED MANUFACTURERS**, with about **HALF** of U.S. companies' manufacturing base in the U.S. across **19 STATES**

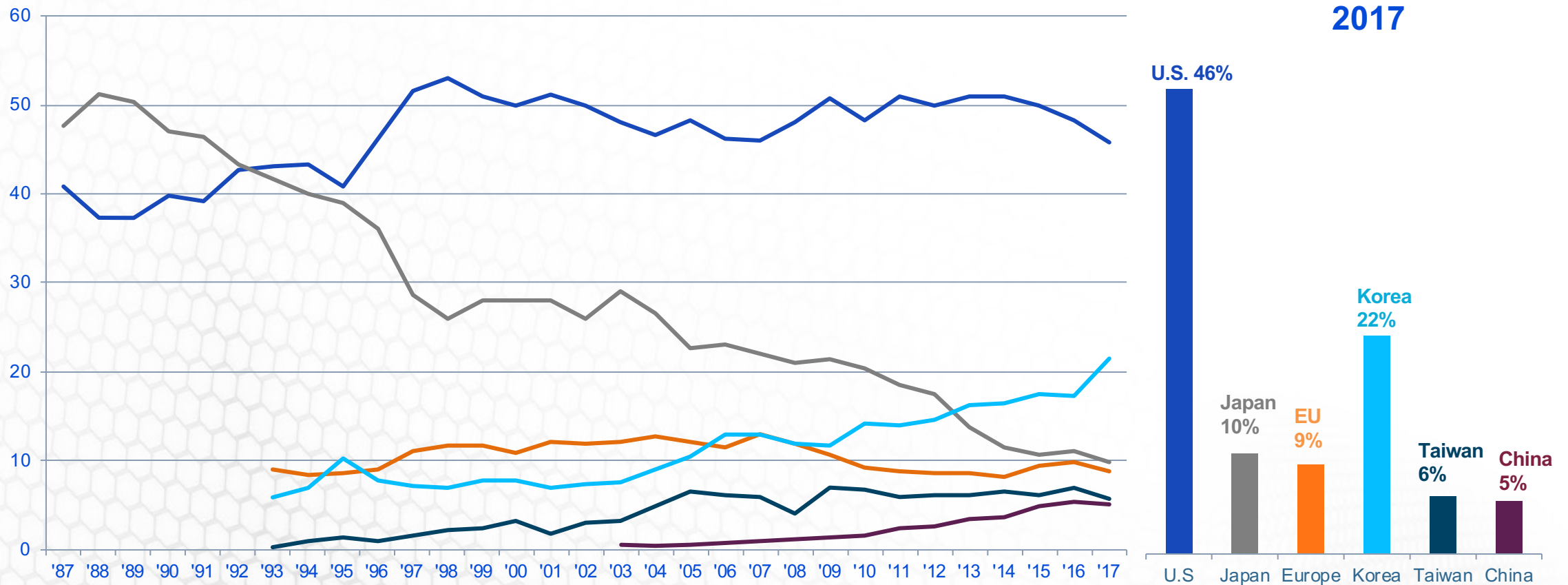


America's **#4 EXPORT** after airplanes, refined oil and automobiles

In 2017, the United States exported **\$44 BILLION** in semiconductors and maintained a consistent trade surplus in semiconductors

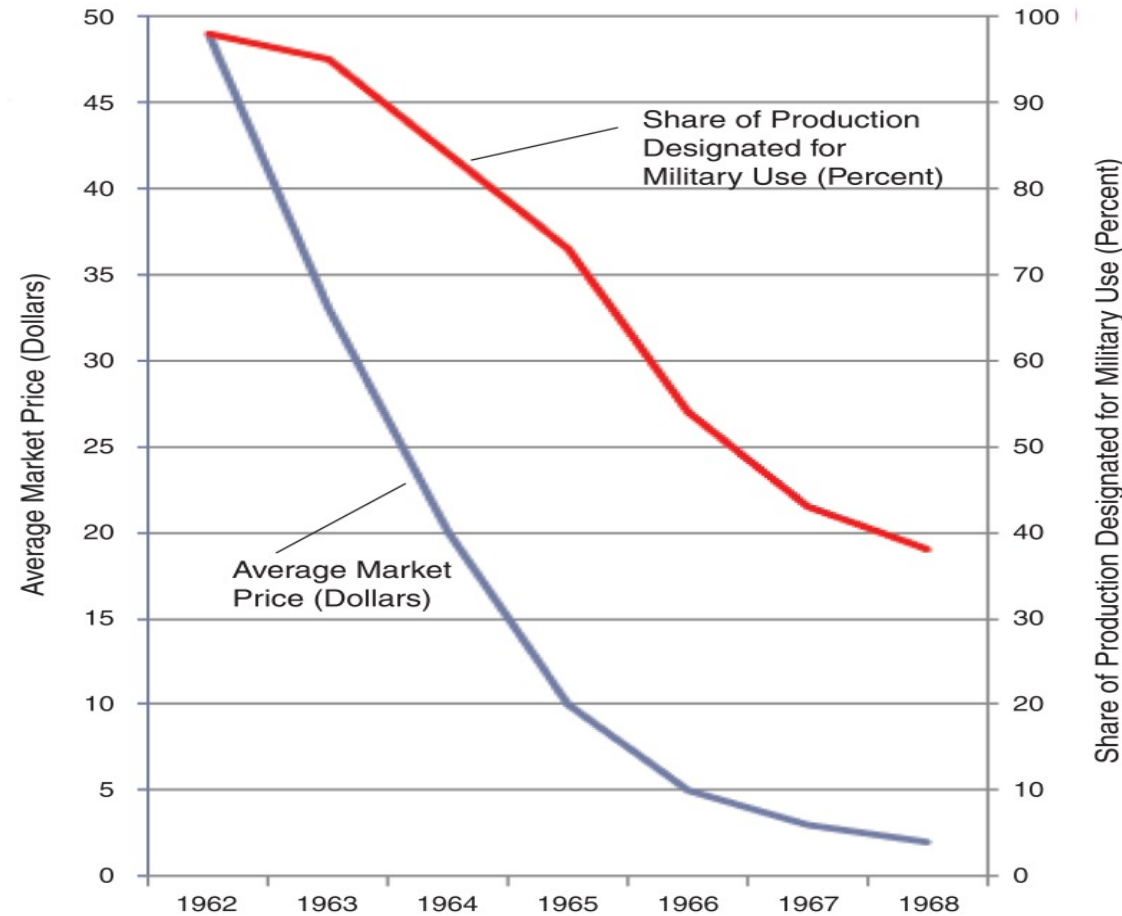


The U.S. semiconductor industry has nearly half global market share



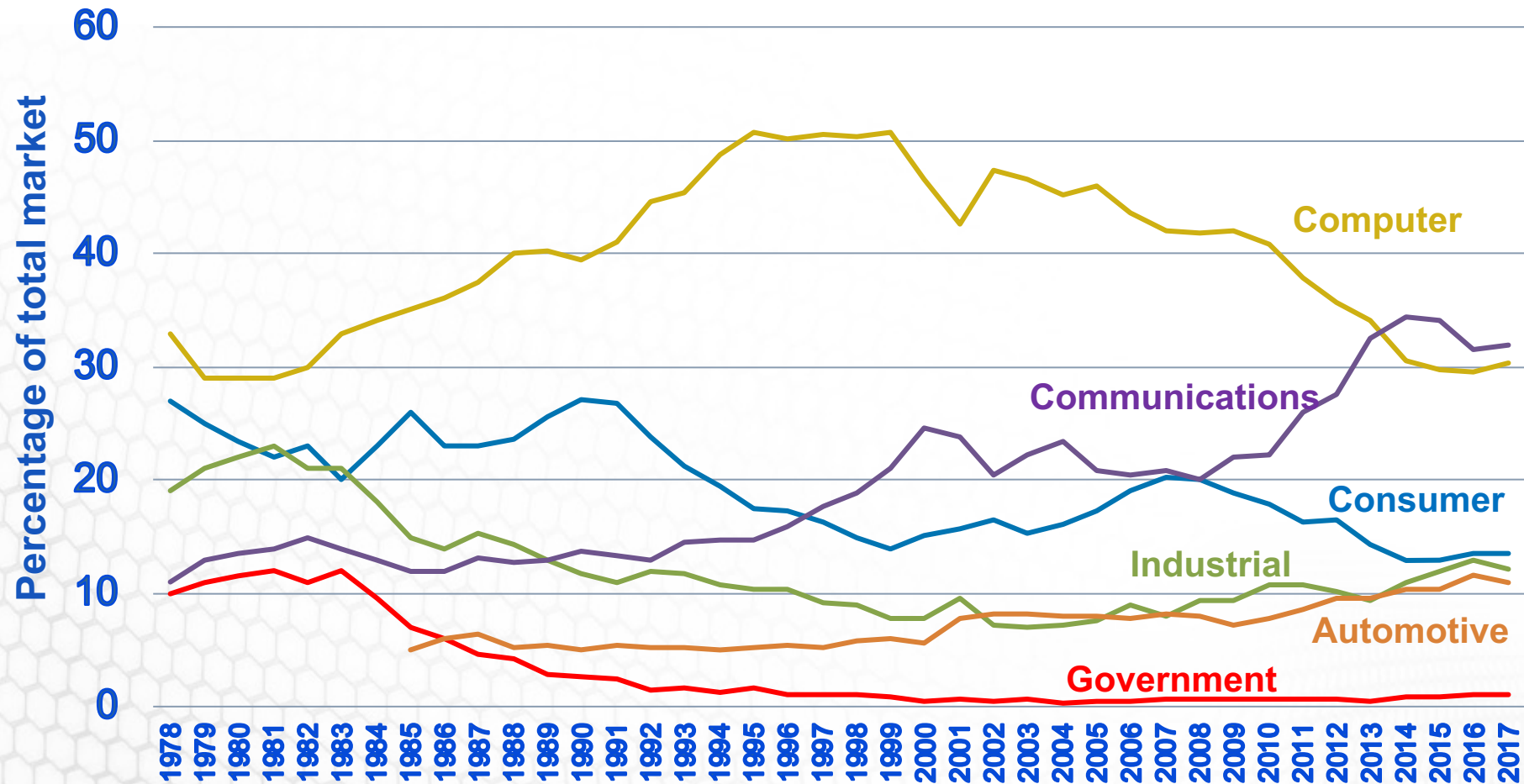
Source: SIA, World Semiconductor Trade Statistics (WSTS), IHS Global, PwC.

Early U.S. semiconductor industry growth and development was fueled by govt/military demand



Source: National Research Council of the National Academies, "Rising to the Challenge: U.S. Innovation Policy for the Global Economy," Page 326, Fig. 6.1.

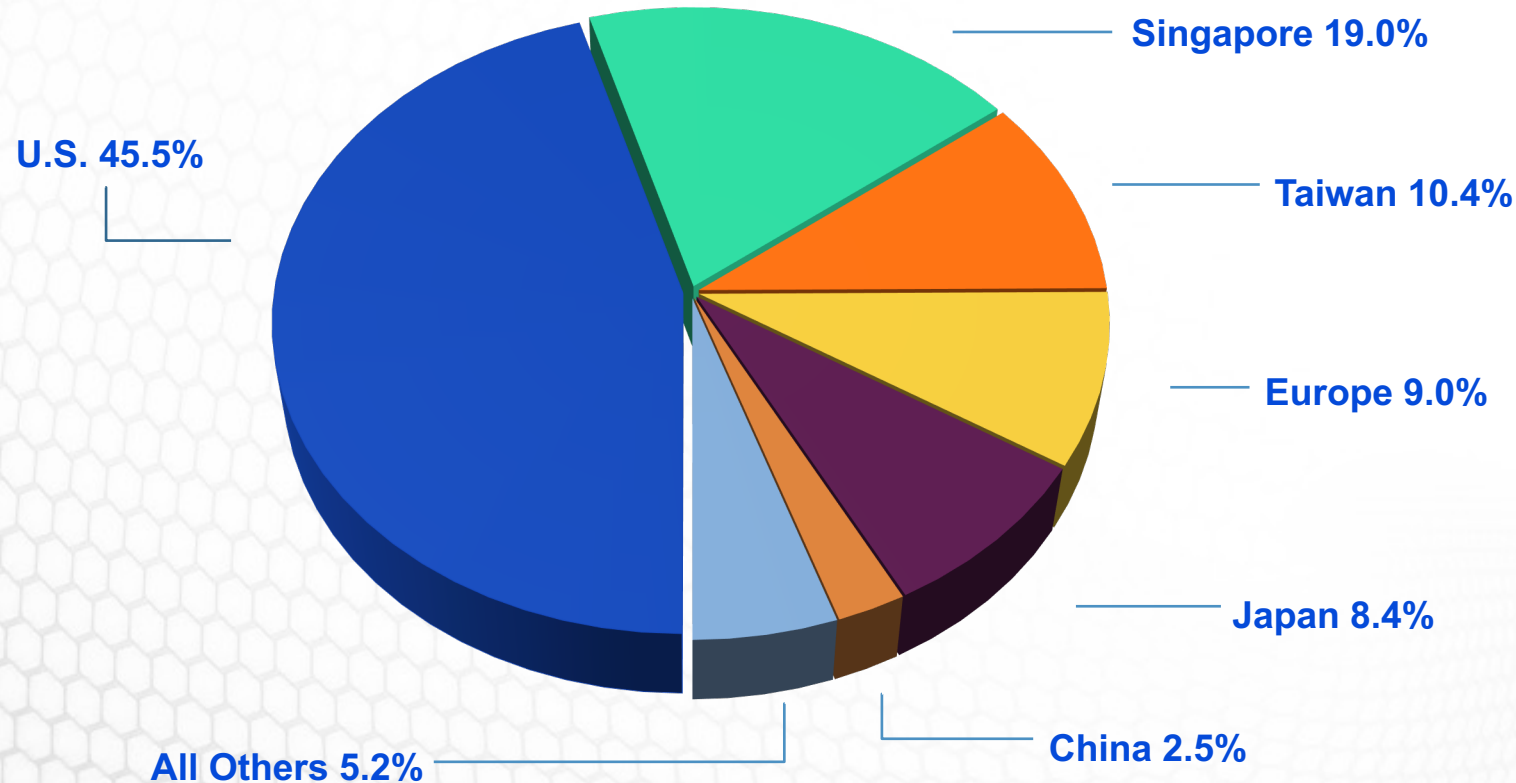
But end use markets for semiconductors have changed significantly; govt share consistently ~ 1%



Source: Semiconductor Industry Association (SIA) and World Semiconductor Trade Statistics (WSTS) program

The U.S. semiconductor industry maintains more of its manufacturing base in the United States than in any other country

Percent of U.S.-Headquartered Firm Semiconductor Wafer Capacity by Location



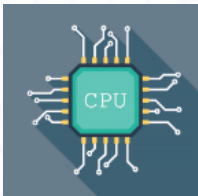
Note: Figures are rounded to the nearest 10th.

Source: IC Insights Global Fab Database and SIA Estimates.

Semiconductors are one of America's top exports

Top 4 U.S. Exports in 2017 (\$ Bn)

Semiconductors \$44 Billion



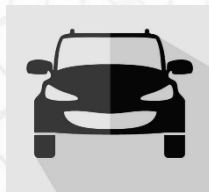
Refined Oil \$83 Billion



Aircraft \$121 Billion

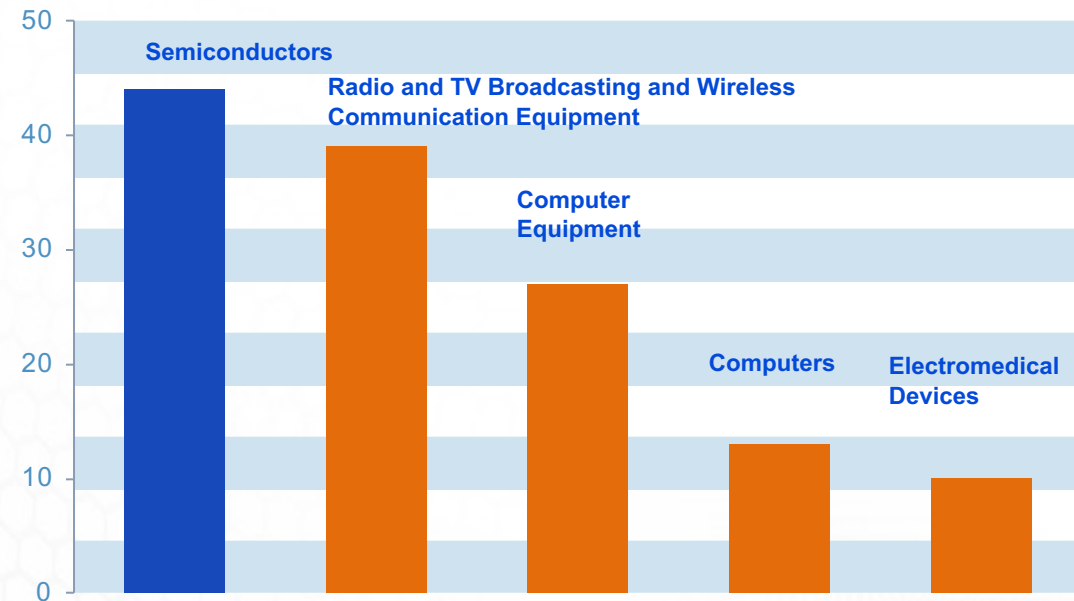


Automobiles \$47 Billion



Source: U.S. International Trade Commission. Industry defined by NAICS codes: 334413 (Semiconductors); 33641X (Aircraft); 324110 (Refined Oil); 336111 (Automobiles).

#1 U.S. Electronic Product Export in 2017 (\$ Bn)



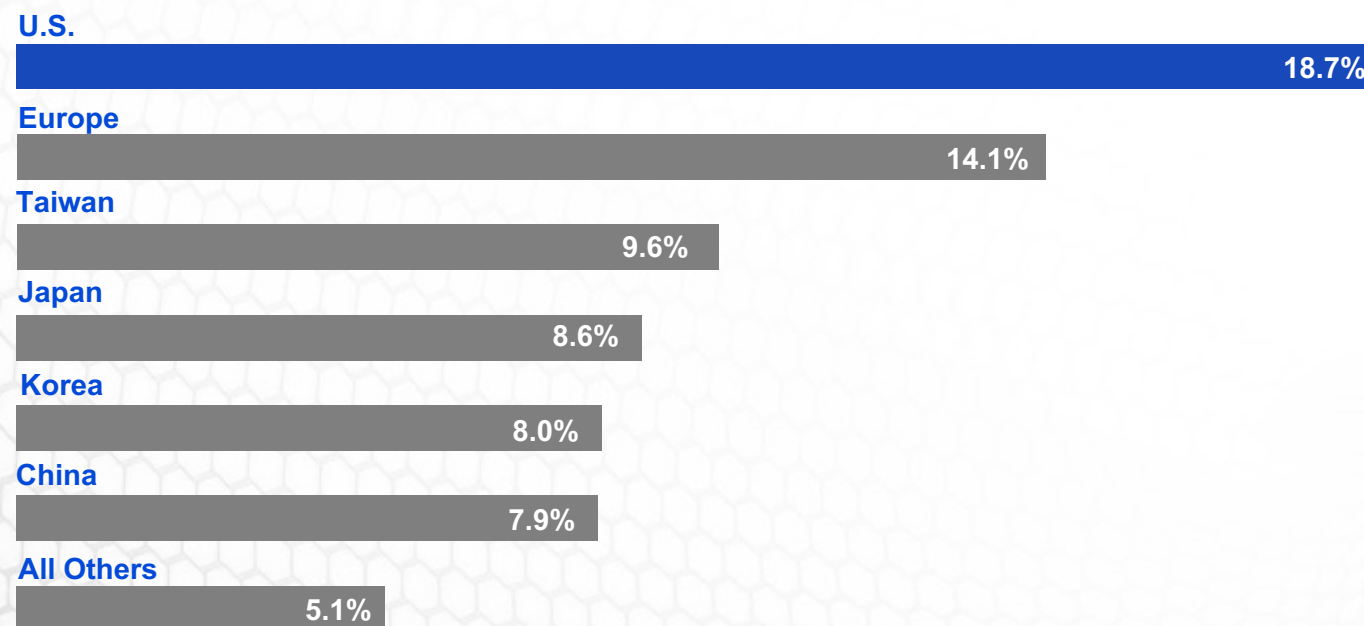
Source: U.S. International Trade Commission. Industry defined by NAICS codes: 334413 (Semiconductors); 334220 (Radio and TV Broadcasting and Wireless Communications Equipment); 334118 (Computer Equipment); 334111 (Computers); 334510 (Electromedical Devices).

Note: Some subproducts within NAICS 334413 that are made by different industries and serve different markets (e.g. solar cells) are excluded.

The U.S. semiconductor industry is more R&D intensive than that of any other country

THE U.S. SEMICONDUCTOR INDUSTRY SPENDS MORE ON R&D AS A PERCENT OF SALES THAN ANY OTHER COUNTRY'S SEMICONDUCTOR INDUSTRY

R&D Expenditures as a Percent of Sales



Note: Slight differences in semiconductor industry share from page 18 table due to differences in methodology and source data.
Source: The 2017 EU Industrial R&D Investment Scoreboard.

Challenging Competitive Landscape

China's National Push in Semis



**Government
Task Force**



**National
Strategy**



**Massive
Funding**

**IC Industry
Leading Small
Group**

**IC Industry
Experts Group**

**2014 State
Council IC
Industry
Guidelines**

**2015 High
Performance
IC Program**

Megaprojects

**\$21B National
IC Fund**

**\$24B Announced
Local IC Funds**

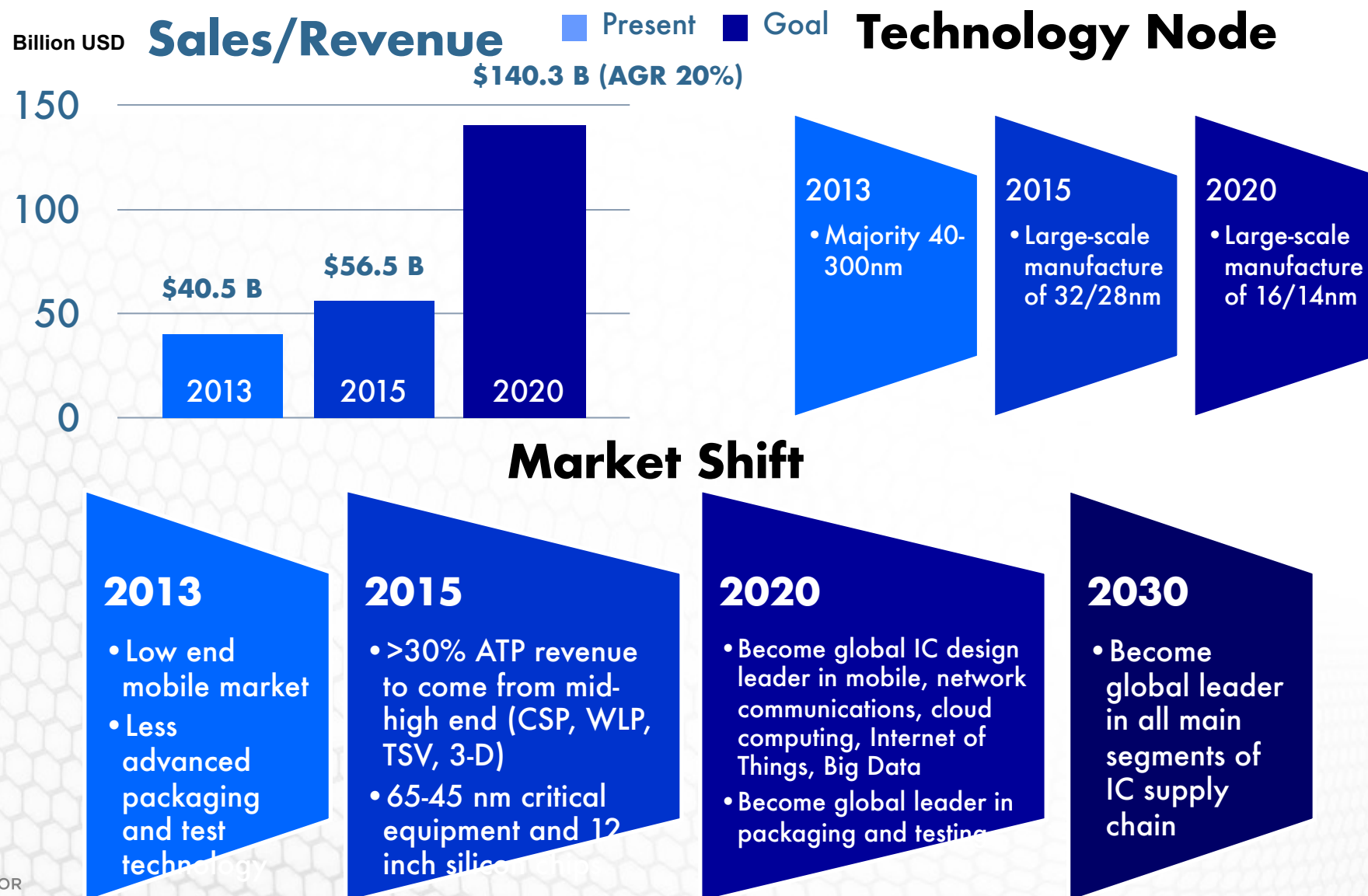
**\$100B in likely
Bank Loans**

“...cybersecurity is critical to national security... China must have its own and capable core technologies...”

President Xi Jinping
January 2014



“New Document 4” China’s IC Industry Development Goals

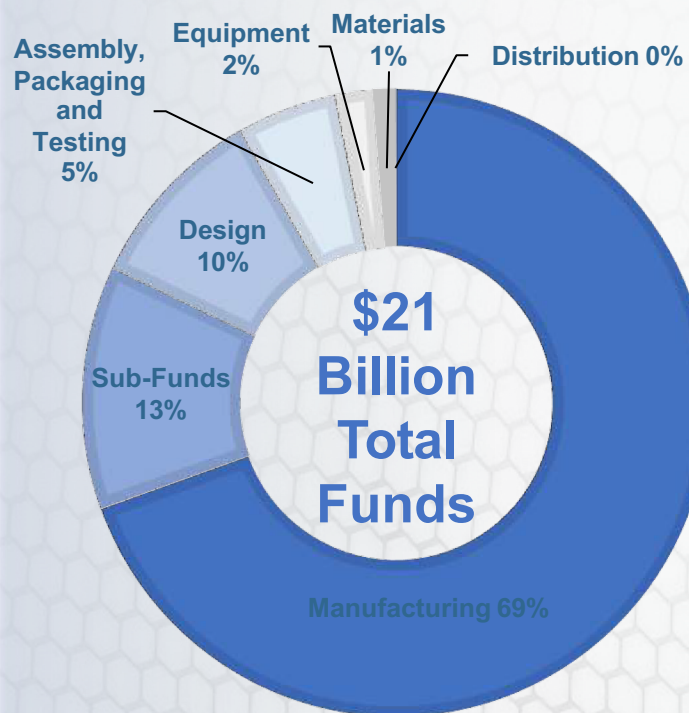


Note: the sales values are converted into USD from RMB at the current exchange rate of 6.2 RMB/\$

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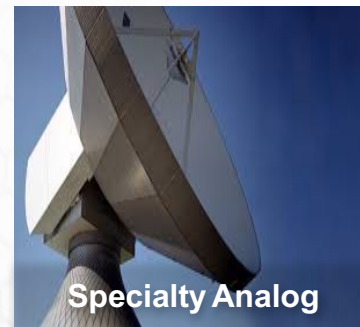
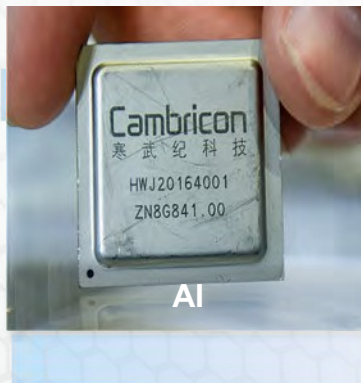
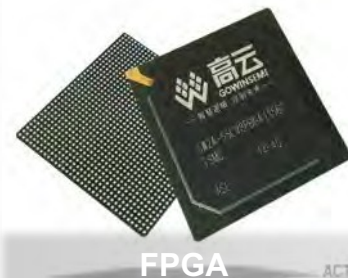
National IC Fund, MIIT remain drivers

National IC Fund Primarily Investing in Manufacturing



Source: SIA Analysis

\$20B - \$30B Phase II to Focus on IC Design



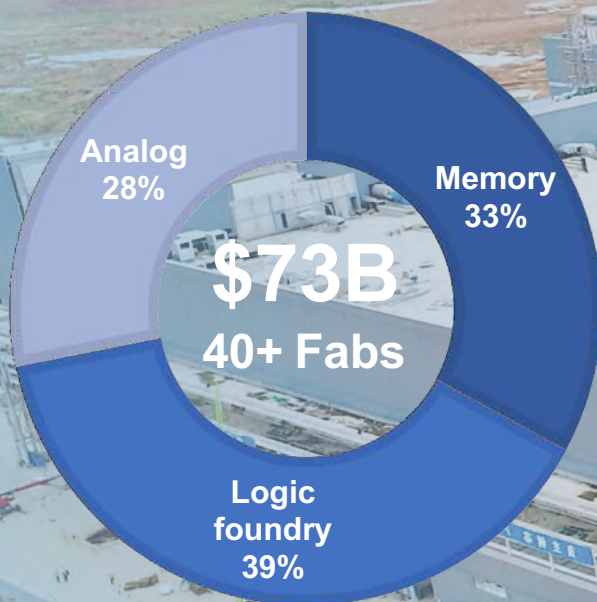
MIIT Implementing Supply Chain Localization Plans



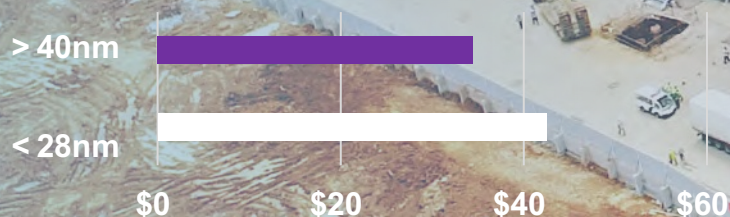
- **Memory (3D-NAND/DRAM)**
 - Materials → Design → Manufacturing → Application
- **Programmable Logic**
 - Component → Software → Systems → Applications

Bulk of government support still in fab construction

Investment by industry segment



Investment by process node (Bln \$)



A blurred background image of a semiconductor manufacturing facility. In the foreground, a worker in a white cleanroom suit and safety glasses is operating a piece of machinery. Other workers in similar attire are visible in the background. The scene is brightly lit with some purple light accents.

Thank you

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