

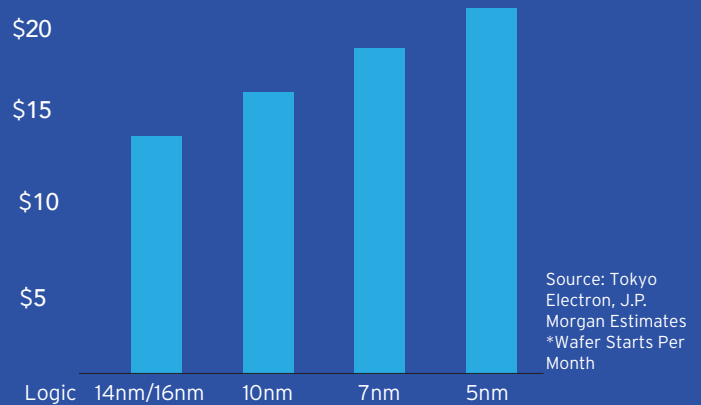
U.S. NEEDS GREATER SEMICONDUCTOR MANUFACTURING INCENTIVES

Government investment has been a prominent contributor to the development of semiconductor production since the early days of the industry. Because of the immense technological challenges and rising costs facing the industry - a single fab costs \$10-20 billion to build - no chip fabs are built today without some form of public support. There is fierce competition to attract the next fab among a small number of nations that view chip production as a national priority. Many governments provide generous incentives to attract and develop semiconductor manufacturing capabilities within their borders, including direct grants, free land, equity investments, infrastructure support, reduced utility rates, tax holidays or credits, and hiring credits. The OECD estimates that 21 major semiconductor firms have received more than \$50 billion in government support between 2014-2018, spread across countries including China, Singapore, Taiwan, Ireland, Germany, Israel, South Korea, and the U.S. (OECD, Measuring Distortions in International Markets: The Semiconductor Value Chain 2019).

While the U.S. made important early investments in semiconductor R&D, those have dwindled in the recent past, particularly in comparison to the semiconductor manufacturing investments and incentives offered by other countries. Since 1990, the U.S. share of global chip production (300 mm manufacturing capacity) has declined from 37% to 12% today and is projected to further decline to 9% in 2030 unless U.S. policymakers take action. At the same time, China is projected to grow its share of global chip manufacturing from today's 12% to 28% by 2030.

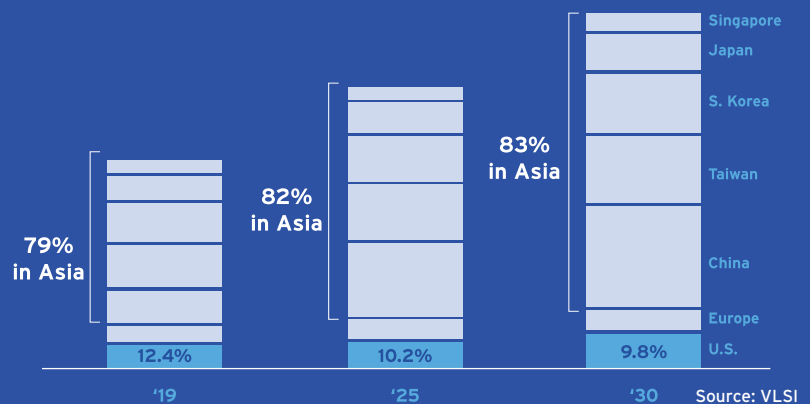
CAPITAL INTENSITY TRENDS – FOUNDRY/LOGIC

\$ in Billions of WFE (100K WSPM*, Greenfield)



ASIA PROJECTED TO CAPTURE NEARLY ALL MANUFACTURING GROWTH

2019-2030 Installed Global Wafer Capacity Projection



SEMICONDUCTOR MANUFACTURING INCENTIVES BY COUNTRY

	CHINA	S.KOREA	SINGAPORE	JAPAN	TAIWAN	EUROPE	ISRAEL	U.S.
Share of 300 mm Manufacturing Capacity (2019)	12%	26.7%	6.5%	16.3%	22.9%	2.8%	0.8%	12%
Manufacturing Grants/Subsidies (2000-2020)**	~\$50B	\$7-10B+	\$5B+	\$5-7B+	\$0.5B+	\$2.5B+	\$2.5B+	\$0
Federal Tax Incentives (2000-2020)***	5-yr tax holiday Reduced tax rate Tax credits VAT refunds	5-yr tax holiday Reduced tax rate Tax credits	Reduced tax rate (0-13%)	Tax credits	5-yr tax holiday Tax credits	Tax credits	Reduced tax rate (6-12%) Tax credits	None
Other Federal Manufacturing Incentives	Free/discounted land Infrastructure support Equipment leasing Preferential loans Localization policies	Infrastructure support Equipment incentives Workforce training	Equipment Incentives Hiring Credits	Preferential loans	Free/discounted land Infrastructure support Preferential loans Workforce training Hiring credits	Preferential loans	Free or discounted land	None
Compound Annual Growth Rate (CAGR) of 300 mm Capacity (2013-2020)	15.7%	11.3%	10%	7.4%	6.5%	*	*	2.2%

*Incentives have been focused on maintaining capacity

**Estimates based on SIA analysis of national-level direct funding to companies

***Industry-specific tax incentives

Sources: IC Insights, Inc. - Strategic Reviews Fab Database; SIA industry analysis; OECD Semiconductor Report (2019)

EXAMPLES OF MANUFACTURING INCENTIVES IN CHINA



Since 2011, the Chinese government has announced over \$100 billion in subsidies to support its domestic semiconductor industry, with a significant portion dedicated to chip manufacturing, assembly and test. China is funding the construction of more than 70 fabs through a range of support measures including grants, equity investment, reduced utility rates, favorable loans, tax breaks, and free or discounted land. China's global share of 300 mm chip production is 12% today and has grown by 15.7% annually over the last seven years. As a result of these incentives, China is projected to have the largest share of global chip production (28%) by 2030. Some incentives, such as grants, are privately negotiated between the local government and the semiconductor company. Public examples of incentives include:



Equity Investments: China has two national chip funds (Phase 1 and Phase 2) totaling \$50 billion. 66% of Phase 1 National IC Fund investments are dedicated to the manufacturing sector. The OECD estimates that total PRC government support exceeds 30% of the annual revenues of leading Chinese chipmakers.¹



Tax Incentives: China provides a 13% VAT refund for IC equipment purchases by a designated list of 29 IC manufacturers in China.² China's current tax policy provides a 5-year corporate tax exemption for companies producing sub-65 nm node chips, and a 2-year tax exemption for those producing sub-130nm node chips.



Land: Local governments offer industrial land for free or at reduced prices to support manufacturing. According to the OECD, chipmakers in China have purchased land for less than a third of its value.³



Favorable Loans: According to the OECD, China's four state-backed semiconductor companies received a total of \$4.85 billion in below-market loans from China's financial institutions between 2014-2018, accounting for 98% of below-market borrowing among the 21 companies identified in the report.⁴ Between 2006-2020, China's state banks have provided \$10.1 billion in low-interest loans to China's two leading semiconductor firms.⁵



Grants/Subsidies (Localization): China has numerous government subsidies that finance Chinese chip designers to use local foundries. Many of China's R&D programs are contingent on manufacturing domestically.⁶ The Made in China 2025 plan sets up a semiconductor self-sufficiency rate of 40% by 2020 and 70% by 2025.⁷ The state-backed 2018 "AnKe" project seeks to replace foreign ICT hardware with domestic vendors in government and critical infrastructure systems in the next 5 years, providing significant incentives for chipmakers to manufacture in China.⁸

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