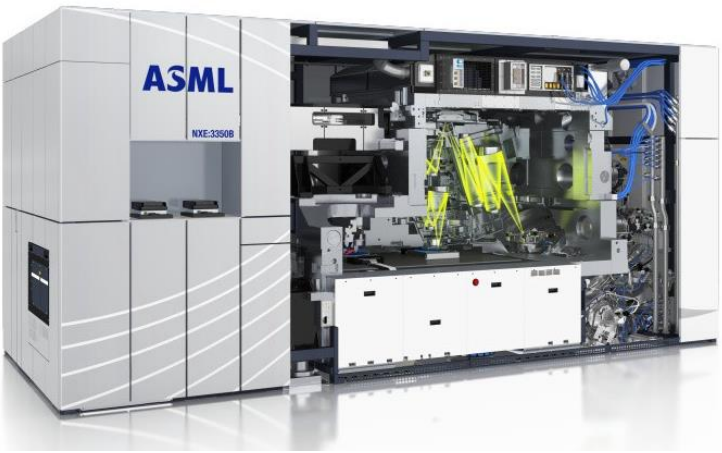
Chips – Will Increased Demand & Financial Incentives Move Manufacturing Back to the US

The semiconductor chip shortage highlights a major infrastructure problem for the US – 75% of semiconductors are manufactured in Asia. Twenty-five years ago, the US produced 37% of the world's semiconductor manufacturing in the US but today only produces 12%. In our June 2021 enterprise storage newsletter, we highlighted the chip shortage and, in particular, the impact on the automotive industry. Even the most basic gas-powered car now has over 100 chips, while the latest electric vehicle may hold more than 1,000. The chip shortage has resulted in few available gaming consoles, cars with limited features, and a reduced production of iPhones.

The U.S. Senate passed the CHIPS Act, a $52B bill to address semiconductor shortages but today, over six months later, the House has yet to act on the legislation. Intel Corp, the biggest U.S. manufacturer of chips, has lobbied aggressively for funding. Other large players, like Qualcomm Inc, Advanced Micro Devices, and Nvidia Corp, focus their efforts on design and rely on partners for manufacturing. These design-focused companies have expressed concern that the legislation will only incentivize manufacturing, not the design side.

Deputy Secretary of Commerce Don Graves stressed there will be investment in both sides of the equation, "You can't divorce the design side, the innovation side, the research side, from the manufacturing side. Once the CHIPS Act gets passed, we'll be very focused on investing to make sure that part of the ecosystem is getting the investment and support that it needs."



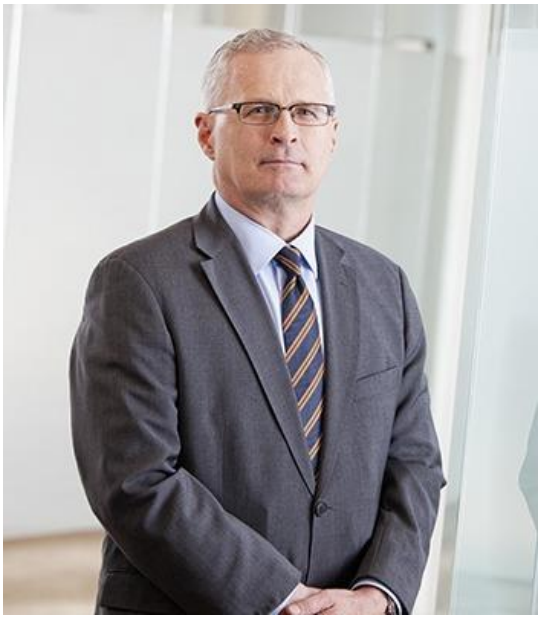
Chip industry leaders say other countries are more aggressive in providing financial incentives for development. The Chinese government will spend $150B over the next decade to achieve chip manufacturing self-sufficiency. South Korea will invest $55B over the next three years to update and expand its manufacturing. The European Union has

committed $25-$35B and will introduce tax and other incentives in an effort to capture 20% of global chipmaking by 2030.

Our government has banned the sale of the most advanced computer chips to Chinese companies with close ties to the Chinese government. The Dutch firm, ASML, is the world's only maker of the $150-million extreme ultraviolet lithography machines needed to etch the most miniscule features into silicon chips. The US has blocked ASML from exporting to China as well.

As the complexity of chips has increased, the field of companies capable of manufacturing to meet these needs has narrowed to TSMC in Taiwan, Samsung in South Korea, and Intel in the US.

In turn, companies that make microcontrollers, less advanced technology, are making up for some of the demand. They are less expensive to make and meet the objectives of many products that do not need the advanced technologies. For example, Microchip Technology, GlobalFoundries, and Wolfspeed are increasing manufacturing. Texas Instruments is constructing a $3.1B chip plant and may invest in another. TSMC, the world's biggest chipmaker, is building a $12B manufacturing plant in Arizona. Intel will invest $20B in two chip manufacturing sites in Arizona but will also spend $95B to manufacture chips in Europe.



"We just want to make sure that more of the manufacturing facilities that are being built in the future, that more of them are built here," John Neuffer, President and CEO, Semiconductor Industry Association. "It's about making sure that, going forward, we have a better-balanced supply chain."

Neuffer says the U.S. is falling behind other countries in developing its semiconductor industry, in part because many other countries heavily subsidize their own operations. It can cost 30% to 40% more to build a semiconductor manufacturing facility in the U.S., he said. "We're not dealing with a level playing field here," Neuffer said. "Until that calculus is changed, our manufacturing capabilities will continue to erode."

Chipmakers say they are plan to manufacture where the numbers make the most sense and without direct financial incentives that is unlikely to be in the US. Micron plans to spend more than $150B on chip research and development but says that they will build new plants overseas unless there are financial incentives to build in the US. Sanjay Mehrotra, Micron CEO, says, "We will be engaging with the governments around the globe, including in the U.S., to address our needs for growing our supply in line with our demand expectations for the 2030 era."