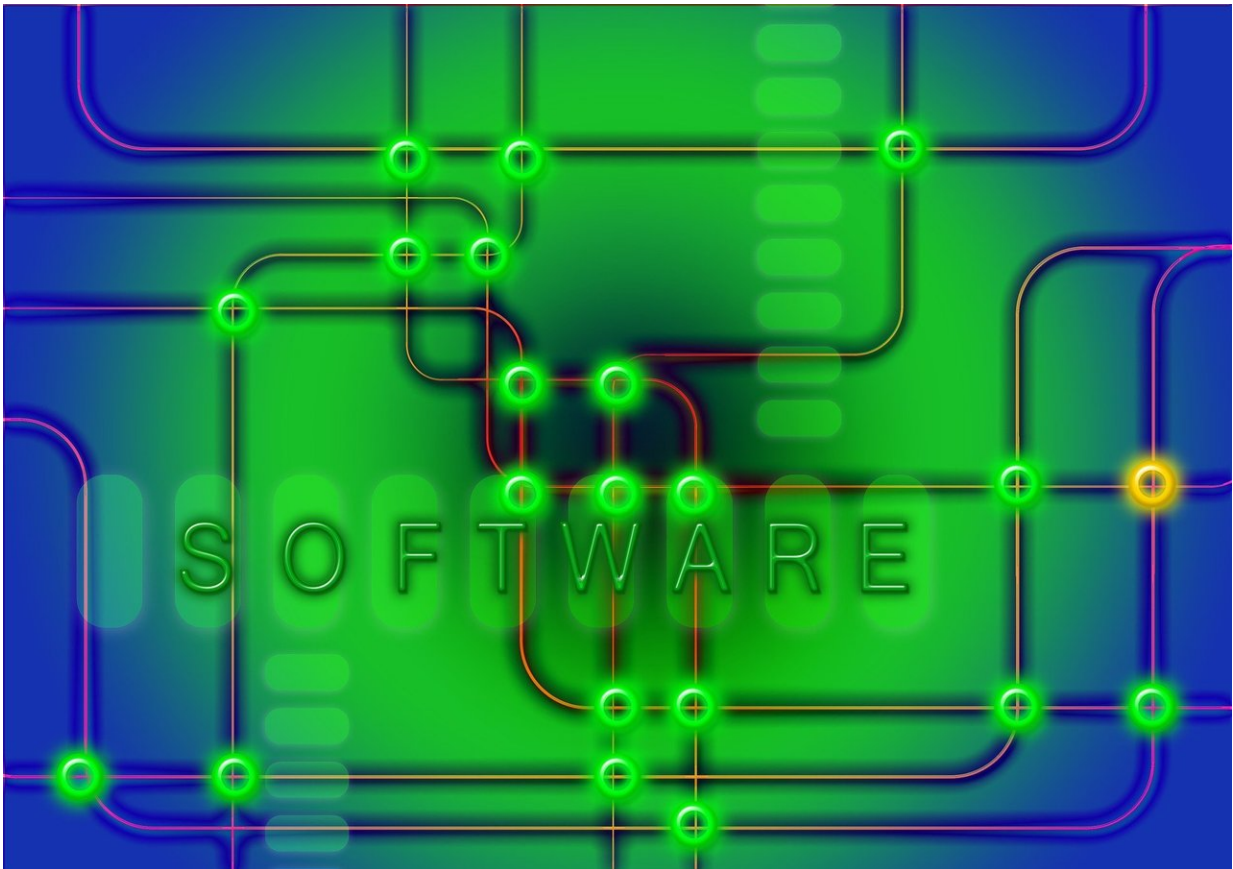


Cost to rebuild US semiconductor manufacturing will keep growing

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As Washington debates spending \$52 billion to start regaining America's former role as a leading semiconductor manufacturer, experts say the

public and private cost over the next two decades may exceed 10 times that much—and some worry such spending may still not achieve the goal.

On Friday, the House passed the measure to appropriate the \$52 billion in subsidies over five years, largely for grants to catalyze private companies' construction on U.S. soil of semiconductor fabrication factories, which are known as fabs. The Senate passed a similar bill last year. With President Joe Biden supporting the measure, some version of it may soon become law.

Some conservatives take issue with elements of the bill's semiconductor section and with other parts of the nearly 3,000-page House version. And others reject the very notion of such massive aid to [private industry](#). But most members of Congress believe the spending is needed to ensure that the United States is not overly reliant on vulnerable overseas supplies of components that are nearly as critical as energy to both the global economy and U.S. national security.

The debate occurs amid a semiconductor shortage that is driving up inflation. It also comes as worries grow that Taiwan, where 92 percent of the world's high-end chips are made, could be invaded by China or that even a lesser crisis in that region could hamstring supplies that everyone from the Pentagon to General Motors relies upon.

But the long-term financial commitment that experts say would need to follow the \$52 billion appropriation is rarely discussed.

Over the next two decades, the spending required from the public and private sectors to build and operate enough fabs to give America a reliable supply for most of its needs will probably exceed \$500 billion, including the initial \$52 billion, semiconductor policy experts at the Potomac Institute for Policy Studies told CQ Roll Call this week. Other

experts said that estimate is reasonable.

Still, many analysts emphasize that the government money must help companies defray not just the cost of building new fabs—which is the current focus—but also the more challenging part: the cost of operating them. Otherwise, they say, the scores of billions of dollars may be misspent.

"In many cases, the government throws money at something, and then it doesn't solve the problem, because the money was not allocated to the places it needed to be," said Bryan Clark, a Hudson Institute senior fellow who performs studies on microelectronics for the secretary of Defense. "This is just going to be another example of that."

Wrong approach?

Three decades ago, Americans built nearly half of the world's most modern chips but now produce only about 12 percent, according to industry figures. Americans still lead the field in designing chips.

The legislation that Congress is weighing to begin to regain the old share of the market would finance mostly the building of fabs with grants of up to \$3 billion per project.

But U.S. companies have never lacked money to build fabs, Clark said. What drove the companies out of the production business in the first place was the high cost of operating such facilities compared to competitors abroad, who had the benefit of not only government subsidies but also in many cases lower labor, tax and regulatory compliance costs.

The funds needed for constructing fabs could always be bankrolled by loans or bonds, Clark said—but not so with operating expenses. He

favors government incentives such as tax breaks to support the cost of running a fab.

Others agree that sustaining the fabs will be at least as important as building them.

"The reason American companies moved offshore last time is because we were not price competitive," said John Nichols, a senior fellow at the Potomac Institute for Policy Studies. "So without sustained government investment and subsidies to keep the industry price-competitive internationally, 10 years from now, when we've built all the fabs, we're going to have the same problems if it's too costly to do this stuff in the United States."

Private sector's role

The government spending must not only be ongoing and focused on sustaining the fabs that are built, the experts said, but it also must be backed up by at least as much private money.

"The only way this will work is if this government money spawns co-investment by industry," said Michael Fritze, who is also a senior fellow at the Potomac Institute for Policy Studies.

As Congress debated the chips funding, Intel Corp. announced this month a \$20 billion investment to build a new chip-manufacturing center near Columbus, Ohio.

The Semiconductor Industry Association of America believes that pattern will recur. They say a \$50 billion investment from the federal government in chip manufacturing would create 10 fabs that would not otherwise be built and would trigger some \$279 billion in additional private sector investment.

The group also says such federal support would create an annual average of 185,000 temporary or permanent American jobs and would add \$24.6 billion per year to the U.S. economy.

"Leaders in Washington have a historic opportunity to reinforce domestic chip production and innovation for many years to come," Dan Rosso, a spokesman for the association, told CQ Roll Call.

Chips are up?

The pending spending bills would appropriate funds first authorized in the so-called CHIPS Act, which was part of the fiscal 2021 National Defense Authorization Act.

The likelihood of further government support will affect how much of the total cost is borne by industry, said Mark Lewis, a former top Pentagon official who is now executive director of the Emerging Technologies Institute at the National Defense Industrial Association.

"The next set of decisions to be made by Congress on how much money to actually put behind the CHIPS legislation will send a signal on how serious we are in recapturing microelectronics production, and it will also shape both government and industry investment strategies," Lewis said.

Whether all the spending makes America free of foreign supplies for most of its chips will also hinge largely on U.S. corporations' ability to attract and retain a sufficiently large number of people with the arcane skills to operate impeccably sanitary and highly specialized equipment.

"Without qualified candidates to run the fabs, it doesn't matter what we invest in the facilities," said Jennifer Buss, CEO of the Potomac Institute for Policy Studies. "They won't be operational."

Competing for that talent will not be easy. The looming splurge of U.S. spending will create a response from other countries, and that will up the bidding for this small pool of talent. Those competitors include some countries that have made chip manufacturing a national mission: allies such as Taiwan, South Korea, Japan and the Netherlands, plus China.

Cost of reliance

While \$500 billion is a lot of money by anyone's measure, that level of public and private spending is standard in the global semiconductor field. Worldwide sales of chips were more than \$500 billion in 2021 alone, according to industry estimates.

And in just the last several years, China, South Korea, Japan and the European Union have announced about \$260 billion in government spending in the next decade for their companies, according to the Semiconductor Industry Association.

Appropriations to rebuild U.S. chip manufacturing would be well spent, if tailored in the right way, many experts said.

The current chip shortage and its dire effects could foreshadow a worse crisis, as the growing number of devices connected to the web and the emergence of electric cars and other new products require even more—and more sophisticated—semiconductors.

The cost of restoring lost American [chip](#) manufacturing must also be weighed against the wealth that would be lost from a cutoff or cutback in semiconductor supplies. Such a crisis could be worse than the current shortages, and it could be triggered by anything from a climate catastrophe to another pandemic to a war.

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