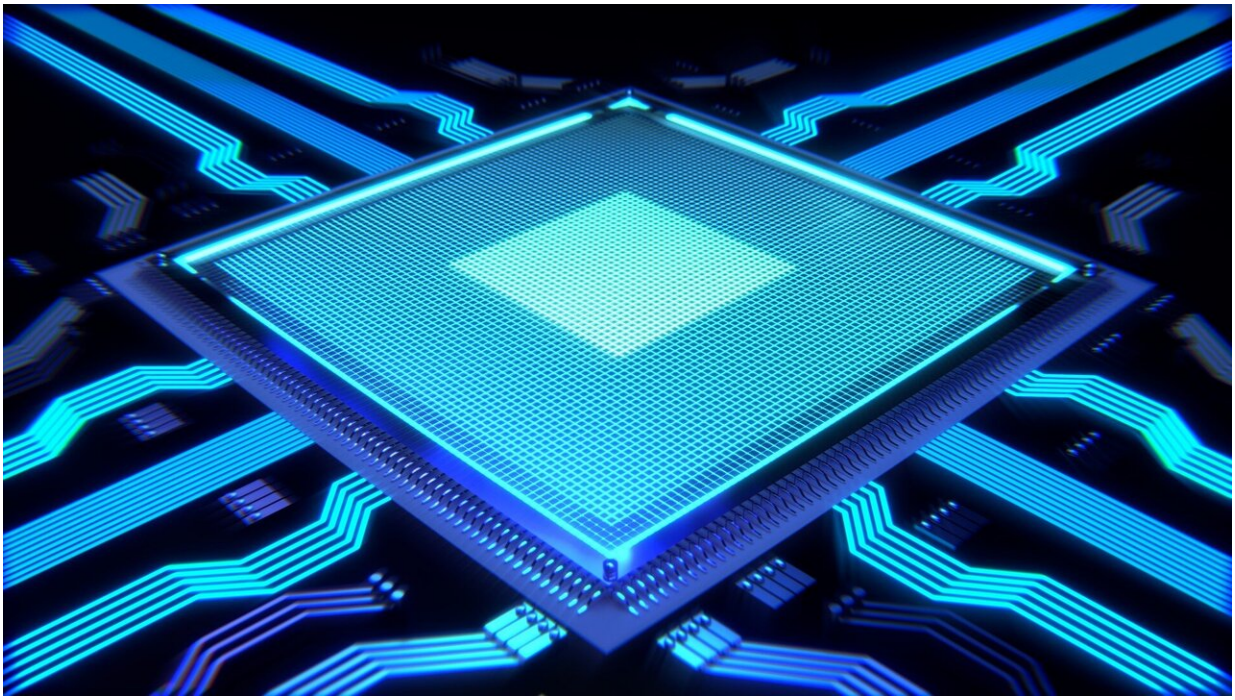
Chip makers offer big investments as they jockey for federal aid

October 26 2022, by Gopal Ratnam, CQ-Roll Call



Credit: CC0 Public Domain

The world's top semiconductor makers have announced in recent months long-term U.S. investments that could rise to more than $400 billion, citing support from a new federal aid program for which the rules have yet to be written.

Intel, Micron, IBM, Samsung, Taiwan Semiconductor Manufacturing

Co. and others say their plans to build or expand U.S. semiconductor fabrication facilities, or fabs, are at least in part dependent on getting federal grants.

The companies' widely publicized announcements, with President Joe Biden participating in an Intel groundbreaking in Ohio and visiting an IBM plant in New York, are a sign of the political, economic and security motives that led Congress to enact a law in August meant to revive U.S. manufacturing of semiconductor chips.

But the announcements also came months before the Commerce Department, which is managing almost $50 billion in grant money appropriated by the law, sets rules for distributing the aid. The department plans to begin taking applications in February, and the first grants aren't likely to be awarded until the early summer of 2024.

The early announcements—and their size—have echoes of an event in 2018 in Wisconsin where President Donald Trump, Gov. Scott Walker and House Speaker Paul Ryan, R-Wis., joined Foxconn CEO Terry Gou to break ground on a $10 billion project to make flat-panel displays for TVs and smart phones. More than four years later, the company has reduced the project investment to a few hundred million dollars, citing weak demand and inadequate supplier base.

The companies vying for chips grants haven't said how much they hope to get, or whether getting less than expected will change their investment plans, but they are counting on it.

"We've always been clear, with every announcement that we've made, the importance of CHIPS Act funding to carry them out," Al Thompson, Intel vice president for government relations, said in an interview. "One of the reasons why we were so out front and pushing to get the CHIPS Act funded was because of its importance to our investments in the

U.S."

Intel, in particular, has been vocal about the link between its investments and the grants. In June when legislation was stalled in Congress, CEO Pat Gelsinger warned that the company would go "slow and small or we're going to go big and bold based on the CHIPS Act."

Intel said it could invest as much as $100 billion over the next decade to build one of the world's largest chip-making complexes in Ohio that may include as many as eight fabs, but the initial investment is about $20 billion. The company is also developing facilities in Arizona and New Mexico.

Micron CEO Sanjay Mehrotra also attributed the company's early October announcement of a two-decade, $100 billion plan to build fabs in upstate New York to the law. "There is no doubt that without the CHIPS Act, we would not be here today," Mehrotra said while announcing the plans.

Lawmakers and administration officials say the legislation is meant to reverse the decline in U.S. chips manufacturing, to 11 percent of global fabrication capacity in 2019 from 40 percent in 1990. Taiwan's TSMC and South Korea's Samsung are the world's leading producers, and China is investing heavily to build capacity.

The governments of those countries provided significant subsidies to help the companies build capacity.

Setting up allocation structure

The Commerce Department's National Institute of Standards and Technology has begun the work of figuring out how to allocate the grants by seeking information, including a request on Oct. 12 for comments

from companies on how to structure the program. The comments are due by Nov. 14. A department official said only that decisions on funding won't be made until it has evaluated applications.

The current semiconductor effort differs from Foxconn's Wisconsin project in several ways. The semiconductor spending combines federal spending and tax incentives to support the entire supply chain, including long-term research. The Foxconn project was backed by state tax incentives to encourage job creation. It remains to be seen if federal assistance will reverse the decadeslong decline in semiconductor manufacturing.

Semiconductor manufacturing typically requires economies of scale requiring companies to build significant capacity to drive down costs. TSMC and Samsung each operate multiple fabs with a monthly output of several million wafers or discs from which individual chips are made.

The companies acknowledge their efforts now to shape the program to their advantage.

"Companies are now trying to look at what is the appropriate way to ensure that our applications include the criteria that the department is looking for in terms of workforce development, leveraging private capital, and we will be ready by February," Thompson said.

Stephen Ezell, director of global innovation policy at the Information Technology and Innovation Foundation, or ITIF, said the grants won't affect whether company investments go ahead, but could affect their size.

"Intel has said that they have room for as many as eight fabs in Ohio, and TSMC has said five additional fabs may be possible in Arizona," Ezell said in an interview. "The investments are going to happen, but

how truly big are these going to be" remains to be seen.

ITIF was closely involved in working with Senate Majority Leader Charles E. Schumer and Sen. Todd Young, R-Ind., as they were crafting the funding legislation.

The law aims to support not only global makers of semiconductors but also suppliers of materials, minerals, chemicals and equipment. In addition to grants, the agency also is seeking feedback on setting aside about $6 billion for loan guarantees that companies could use to raise as much as $75 billion.

The Commerce Department's strategy—allocating the grants in three buckets—is also a factor that will determine which companies will be eligible for which parts of the funding:

- About $28 billion, or three-quarters of the incentive funding, would go toward establishing U.S. production of cutting-edge, high-end processing and memory chips. The money would be distributed through grants and loan guarantees not only to individual applicants but to consortia of manufacturers and suppliers.
- Another $10 billion of incentives would go toward fabs making "mature and current generation chips."
- The third bucket, about $11 billion that isn't considered incentive funding, would go for establishing research and development centers set up in collaboration with universities, companies and allies around the world.

A separate portion of the law authorizes funding for research and applications in several high-tech areas such as quantum computing, artificial intelligence and biotechnology.

The department has set up a 25-member industrial advisory board comprised of academics, industry and security experts to advise the agency on the program, and a CHIPS program office whose officials are based at the White House and the department will manage the effort.

In addition to the nearly $50 billion in grants and loan guarantees, the law provides a temporary tax credit equal to 25 percent of the tax basis of a qualified property that is part of a chips manufacturing facility.

The combination of grants and tax credit is key to achieving Intel's long-term vision of becoming a leading integrated device manufacturer, Thompson said. Unlike TSMC and Samsung, which only fabricate and manufacture chips designed by others such as Apple and Qualcomm, Intel designs its own chips and is now adding fabrication capacity.

TSMC and Samsung's concern that the law would exclude foreign companies appears to have been allayed because the text doesn't distinguish between U.S. and foreign companies. TSMC is building a $12 billion facility in Arizona, and Samsung is developing a $17 billion fab in Texas and has said it could invest up to $200 billion to expand its facilities.

Spreading aid too thinly

Given the wide gap between potential investment and the nearly $50 billion in government aid, there's some worry that in trying to please everyone the Commerce Department may stretch it thin with each company getting only a small portion, said one industry executive, asking to speak anonymously in order not to alienate the department.

But suppliers to major commercial fabs are likely to be smaller and require a smaller portion of the grant money, the executive said: "Not everything is a $10 billion or a $20 billion project."