



NEW ZEALAND
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United States efforts to increase domestic semiconductor chip manufacturing

MARKET INTELLIGENCE REPORT

Summary

- Semiconductor chips are a key input into almost all electronic goods and, given shortages during the pandemic, the US became concerned that the majority of manufacturing currently occurs in only a few economies in East Asia.
- To assist in ensuring greater supply chain resilience, the US Creating Helpful Incentives to Produce Semiconductors and Science Act of 2022 (CHIPS) was passed. CHIPS makes available significant new funds of almost USD \$53 billion to increase semiconductor manufacturing and R&D in the US. Bipartisan support for increasing chip production in the US means that support for chip-focused subsidies should continue in some form regardless of who prevails in November's Presidential election.
- In the almost two years since it was signed into law, a number of CHIPS-funded projects have been publicly announced collectively worth around [USD \\$30 billion](#). That said, semiconductor investments are capital intensive and tend to have long lead-in times, and the US, like other countries, also has faced issues like a shortage of skilled workers.
- Other countries are also increasingly focused on chips production, including through growing subsidies programmes. Given the rapid pace of technological change, and the large investments that are required for this technology, the US has indicated that they may be able to increase their share of advanced semi-conductor production to 20 per cent of global supply by 2030.
- CHIPS incentives are available to non-US companies, but conditions are tightly constrained. New Zealand companies' potential ability to access these incentives directly or indirectly will depend on a variety of factors.

Report

The Creating Helpful Incentives to Produce Semiconductors and Science Act of 2022 (CHIPS) was signed into law by President Biden on 9 August 2022. Bipartisan passage of CHIPS occurred after a lengthy period of negotiation across both parties and chambers of Congress. CHIPS appropriates historic levels of new funding to support investments in semiconductor manufacturing and research and development (R&D).

Why are semiconductor ‘chips’ such a big deal?

US think tank [CSIS](#) notes that semiconductor chips (or chips) are an essential input in many goods, “embedded in everything from toasters, smartphones, computers, and cars, to hypersonic guided missiles, advanced telecommunications infrastructure, and artificial intelligence (AI)”.

CSIS also notes that chips became front of mind for US policymakers during the pandemic, as severe strains in international supply chains caused by Covid-19 lockdowns resulted in serious impacts on US production in important sectors, such as medical equipment. These strains alerted the US to the geo-political and economic risks of the concentration of chip manufacturing overseas.

According to the [White House](#), the US’s global share of semiconductor manufacturing had decreased from 37 percent in 1990 to just 12 percent in 2022. This meant that almost 90 percent of leading-edge semiconductor manufacturing was now done mostly in Taiwan, Japan, South Korea, and China. The US relies on commercial chips sourced from these countries and particularly the world’s largest chip maker, the Taiwan Semiconductor Manufacturing Company (TSMC).

Chips are further caught up in another supply chain complexity. Increasingly contested critical mineral inputs, like silicon, are key inputs in their manufacture, and only a handful of countries, including China, produce many of these critical mineral inputs.

What funding is in CHIPS?

CHIPS provides almost [USD \\$53 billion](#) in federal funding for American semiconductor manufacturing, R&D, and workforce development. Key aspects include USD \$39 billion in semiconductor manufacturing incentives and USD \$11 billion in R&D and workforce development (administered by the Department of Commerce or DOC). CHIPS also creates a 25 percent tax credit for capital investments in semiconductor manufacturing and related equipment.

Crucially, this funding includes [“National Security Guardrails”](#) that aim to:

1. prohibit recipients of CHIPS funding from using the funds to construct or modify a semiconductor facility outside of the US;
2. restricts recipients of CHIPS funding from investing in most semiconductor manufacturing in "foreign countries of concern" for 10 years after receiving CHIPS funding; and
3. limits recipients of CHIPS incentives funds from engaging in certain joint research or technology licensing efforts with a "foreign entity of concern”.

DOC have outlined that recipients who violate the restrictions may have to return the full amount of the federal incentives that they have received.

Chips is having an impact but will take time

The US has awarded some CHIPS funding to companies, with publicly announced projects collectively worth around [USD \\$30 billion](#) for companies like: Samsung to build chip fabrication plants (FABs) in Texas; TSMC to build FABs in Arizona; and Intel to support their four different projects across the US for FAB construction, modernisation, and advanced packaging facilities. However, bringing these FABs online is no easy feat. They can take about three to four years to build and be as big as 325 football fields.

The [DOC CHIPS Program Office](#) have underlined that CHIPS is not designed to replace private capital, but rather to further incentivize the investment plans that companies have. DOC Secretary Raimondo has highlighted that “private companies have announced almost [\\$200 billion](#) in [US] semiconductor manufacturing investments”. For example, TSMC has committed to around [USD \\$65 billion](#) for its investments in Arizona and will receive around [USD \\$6.6 billion](#) in CHIPS funding to support this investment.

There are also challenges, like a shortage in the US of skilled semiconductor workers. Despite Secretary Raimondo’s goal of training [“100,000 new technicians”](#), the US needs to compete for these workers on a global scale and it is [predicted](#) that one million additional skilled workers will be needed globally by 2030. Commentators and several major US semiconductor companies argue that immigration reform is needed now, to expand the number of visas for skilled semiconductor workers. Enacting these reforms will be difficult, given contentious immigration discussions in the US.

How many chips will the US produce and will political support for subsidies continue?

Secretary Raimondo has [publicly stated](#) that through CHIPS investments the US is “on track to produce roughly 20 percent of the world's leading-edge logic chips by 2030, up from the zero percent we produce today.”

There is bipartisan support in the US for increasing supply chain resilience and bolstering economic security around access to and manufacture of advanced chips. This means that support for and funding of semiconductor subsidies, in some form, is likely to continue, regardless of the outcome of November's elections.

What does CHIPS mean for other economies?

US investments through CHIPS of USD \$52 billion, while substantial, are said to “amount to less than a third of China's semiconductor subsidies” (according to [CSIS](#)). [DOC](#) also notes that economies like the EU, Japan, Taiwan, India, and South Korea also have their own semiconductor investment programmes.

Some of the US's partners have questioned if CHIPS may have negative flow-on effects for them, such as potentially reducing jobs. However, these questions exist alongside the potential for CHIPS to assist countries, including New Zealand, to increase supply chain resilience by diversifying some production of this essential product away from just a few economies.

Crucially, under the Act, funding is available to both domestic US companies and international companies (for example TSMC discussed above). However, Secretary Raimondo has said that CHIPS incentives will not be provided to chipmakers if their FABs cannot be operational by [2030](#).

What does CHIPS mean for other economies?

Given the complexity of the semiconductor supply chain, New Zealand will have a variety of semiconductor related commercial interests. For example, in the year ended December 2023, we exported around NZ \$69 million worth of semiconductor manufacturing machines, NZ \$91 million of semiconductor devices, and NZ \$14 million of electronic integrated circuits.

New Zealand companies' ability to potentially access CHIPS funding directly or indirectly will depend on factors like: their ownership model, and willingness to either shift manufacturing to the US, or partner with US companies.

[1] Article was from August 2022.

[2] Stats NZ International Trade Data for HS CODES: 8486, 8542, and 8541.

[3] See section III.A.1 of the [CHIPS Incentives Program–Commercial Fabrication Facilities Notice of Funding Opportunity](#) for more information.

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