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Economy vs. environment: Some Taiwanese consider cashing in their chips

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October 9, 2023 at 5:00 a.m. EDT

TAICHUNG, Taiwan — It isn't easy to say "not in my backyard" to one of the most valuable factories in the world. But some residents in Taichung, Taiwan's second-largest city, tried.

Taiwan Semiconductor Manufacturing Co., which already has two factories here, last year proposed a third, where it would mass-produce its tiniest chips yet.

But some balked at the prospect, aware of the environmental burden a third plant would place on Taichung: It would require an amount of electricity equal to a quarter of what the industrial city uses as well as 6 percent of its water, according to local officials.

"We are very concerned about sacrificing water and electricity for the sake of industrial development," Lee Cheng-Wei, the director general of Taichung's urban development bureau, said on a smoggy recent afternoon.

After months of delay, Taichung gave the plant the green light in August. But it sparked an ongoing debate that called into question how Taiwan's economic growth and national security considerations stack up against its environmental concerns. Officials, activists and residents alike wondered how the city could possibly sustain another plant.

TSMC — which makes roughly 90 percent of the world's advanced chips, powering everything including iPhones, artificial intelligence, electric vehicles and fighter jets — is the centerpiece of Taiwan's economy.

It's also a core part of its national security strategy: Taiwanese-made chips have been so indispensable to global supply chains, including to Chinese companies, that analysts have long thought Beijing would not risk disrupting them with military force, effectively protecting Taiwan with a "silicon shield."

The United States also has a strong interest in Taiwan retaining its supremacy over the global chip supply as it has moved to cut off China's access to advanced computer chips to prevent their use in military applications.

Cities around the world have tried to lure TSMC to build its next generation of factories on their shores — partly for the jobs they create, but also to diversify the world's chip supply in case of a clash between China and Taiwan, which Beijing claims is part of its territory. But their drain on water and energy resources has been controversial in places such as Phoenix.

Outside of Taiwan, the company has agreed to plants in Germany, Japan, China and the United States, but they won't make the most cutting-edge chips. Taiwan's national security considerations have made it all the more important that TSMC only builds those here.

"It represents an essential industry that needs to be protected in the conflict between Taiwan and China — it will make other countries willing to intervene," Lee said. "That's why this industry must stay here. They must not allow the outflow of their core technology."

With no other company able to come close to TSMC's dominance over the global chip supply, officials and environmental groups question how long Taiwan's resources can continue to meet the escalating demands of the tech industry.

In Taichung, local activists knew that the factory would win out in the end and that their environmental concerns would not be able to stand in the way of TSMC's relentless growth.

"The government's policy is to ... give them whatever they want, including land and electricity. It is not sustainable," said Chao Hui-lin, a researcher at local nonprofit group Air Clean Taiwan. "We love TSMC, but this is not the right kind of love."

The state utility companies assured Taichung that the next factory wouldn't affect the city's future water and electricity supply, Lee said. TSMC's public relations department said in an email that the company had no information to share on a future facility in Taichung.

But add into the equation a pledge from TSMC, which operates 15 plants in Taiwan, to switch to renewable energy by 2040, and Lee just doesn't see how Taiwan can sustain the growth. "If you look at Taiwan's future energy policy, this plan is mission impossible."

Taiwan is already confronting the limits of its resources. In 2021, a water shortage prompted Taiwan to cut off irrigation to thousands of acres of farmland, and the power grid has suffered multiple crippling blackouts in recent years.

TSMC consumed over 22,000 gigawatt-hours of electricity last year, roughly equal to half of all of Taiwan's households combined. Ten percent of that electricity came from renewable sources.

The company said that it recycles more than 90 percent of the water it uses and that it conserved more than 3 million tons of water in 2022. But that's a fraction of the 105 million tons of water the company said it used across its Taiwan facilities last year, much of which came from local reservoirs.

When asked about these concerns, TSMC's public relations department said that the company takes water management seriously and pointed to a water reclamation project completed last year in southern Taiwan.

"TSMC's goal is to increase the supply of reclaimed water to gradually reduce city water consumption each year," the department said.

The company last month announced all of its energy will come from renewables by 2040, moving an earlier commitment to this goal forward by a full decade.

More broadly, President Tsai Ing-wen's government has pledged that Taiwan will be carbon-neutral by 2050 and that it will completely phase out the use of nuclear power within the next two years, ramping up what it will demand from renewable sources.

To meet this goal, the state power company has built acres of solar panel fields and wind farms across flat land reclaimed from the ocean west of Taichung, where the sun bakes down and the wind whips across the Taiwan Strait. As of August, 11 gigawatts of solar power had been installed, and the government plans 30 gigawatts by the end of the decade — still only a fraction of what TSMC uses.

Officials have already warned that Taiwan will miss its near-term renewable energy targets — not because enough capacity hasn't been installed, but because the amount of energy that the Taiwanese industry requires keeps getting bigger.

Because of TSMC's perceived importance to Taiwan's national security, some activists say they hold back their strongest criticism.

"People are hesitant to oppose [the latest plant]," said Hsu Po-ren, a researcher at the local nonprofit Environmental Rights Foundation. "Nowadays, if you reprimand TSMC, you immediately face a lot of pressure."

Construction is underway on two of TSMC's newest factories in other parts of the country, and there is already talk of a next-generation plant. But questions remain about how Taiwan can sustain them.

“Can our society and our environment afford to supply them?” asked Yang Kuoh-cheng, professor of ecology at Providence University in Taichung. “Can we withstand such a test?”

CORRECTION

A previous version of this article incorrectly stated that Taiwan's state power company had built solar panel fields and wind farms on reclaimed land east of Taichung. The land is west of Taichung. The article has been corrected.