Secretive chip startup may help Huawei circumvent US sanctions

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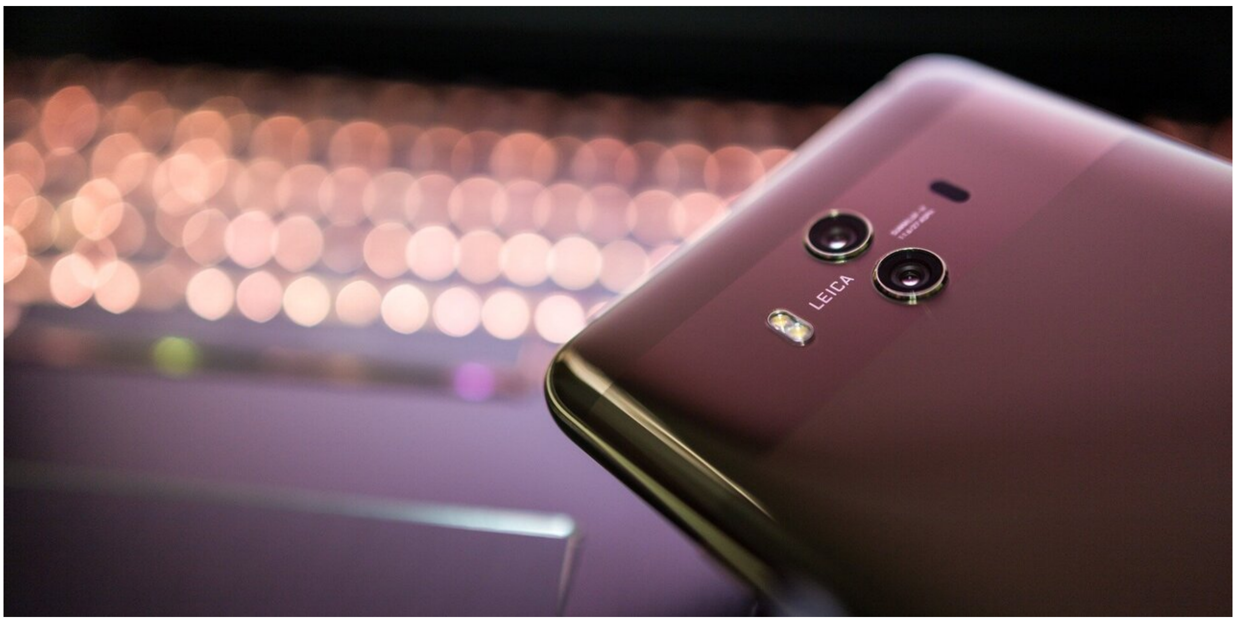

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When the US government blacklisted Huawei Technologies Co. as a national security threat, it cut the Chinese company off from buying American semiconductors and other critical technologies. Now Huawei may have a path around those restrictions.

The Chinese technology giant is providing support to a startup in its hometown of Shenzhen that has ordered chipmaking equipment—including from foreign suppliers—for a semiconductor manufacturing plant, according to people familiar with the matter. The fledgling firm, Pengxinwei IC Manufacturing Co., is run by a former Huawei executive and is constructing facilities close to Huawei headquarters, according to public records and satellite photos.

Huawei is expected to buy most, if not all, of its output, said the people, who asked not to be identified discussing private information. PXW, as the company is known, plans to take delivery of the gear as early as the first half of 2023, one of the people said.

If it succeeds in getting off the ground, the startup could effectively enable Huawei to sidestep Washington's efforts to choke off the flow of chips to a company it views as a military and economic threat. Huawei representatives declined to comment.

The low-profile PXW has already drawn the attention of the US Commerce Department's Bureau of Industry and Security, which helps oversee American trade restrictions.

The department is aware of the startup and "allegations of relationships with Huawei," BIS said in response to a Bloomberg News query. "BIS is constantly on the lookout for efforts to evade export controls, including those related to parties on the Entity List like Huawei, and uses open-source, proprietary and classified information to substantiate and then, when appropriate, apply our administrative or criminal law enforcement as well as regulatory tools to address violations."

It's not clear whether PXW's strategic plans explicitly violate US trade sanctions. If the firm intends to supply Huawei, it would be severely restricted in what chipmaking equipment it can buy from American suppliers. It has more latitude to buy machines from foreign suppliers such as ASML Holding NV and Tokyo Electron Ltd., though they too may need to seek US approval depending on the amount of American technology infused into any products sold.

PXW said in a statement it's inked agreements with suppliers and aims to begin production in 2025, without mentioning clients. The company plans to start working on its 28-nanometer technology—six generations behind the most advanced manufacturing—next year, said one person familiar with its strategy.

Huawei, perhaps more than any other company, has been at the heart of US-China tensions. The Trump administration blacklisted the company in 2019 and pressed allied nations like the UK and Japan to remove its telecommunications equipment out of concern it could be used for spying and espionage. The conflict escalated with efforts to prosecute Huawei's chief financial officer, the daughter of founder Ren Zhengfei, on fraud charges. (Meng Wanzhou, who denied wrongdoing, was allowed to leave Canada for China last year under a deferred prosecution agreement.)

Huawei has paid a heavy price. Before the blacklisting, the company was the world's largest supplier of mobile communications equipment and competed with Apple Inc. and Samsung Electronics Co. in the smartphone business. Its chip design unit, HiSilicon, was a cornerstone of China's attempts to establish a vibrant domestic semiconductor industry. The US actions drove Huawei out of many overseas markets, forced it to sell off its mass-market phone business and cut off its access to chips vital to its success. Ren said this year in an internal employee memo the company is finding it increasingly difficult to grow in the face of American sanctions.

PXW won't be able to build a chip-making business to match capabilities of Taiwan Semiconductor Manufacturing Co., the industry leader that once supplied Huawei. But the startup could help Huawei regain ground in several critical areas, such as smartphones and servers. It's not clear whether the company is using any assets, intellectual property or people from HiSilicon.

President Joe Biden's administration is preparing new restrictions on China's access to chip technology that could affect PXW and similar cases. The Commerce Department plans to roll out a package of rules as soon as this week tightening curbs on semiconductor technologies that can be exported to China, people familiar with the matter have said.

The US government is moving beyond blacklisting individual companies like Huawei and Semiconductor Manufacturing International Corp. in favor of broad restrictions on all Chinese companies, including a ban on purchases of artificial-intelligence chips. The White House is also considering an executive order to place curbs on US investment in Chinese tech companies.

"We previously maintained a 'sliding scale' approach that said we need to stay only a couple of generations ahead. That is not the strategic environment we are in today," Jake Sullivan, the US national security adviser, said last month. "Given the foundational nature of certain technologies, such as advanced logic and memory chips, we must maintain as large of a lead as possible."

In China, the Huawei episode galvanized Communist Party efforts to build a domestic semiconductor industry, a long-standing goal to better compete with the US in cutting-edge technologies. The government has poured tens of billions of dollars into the sector. Huawei itself has invested in more than 40 chip-related companies, according to a research report from Berenberg Bank.

"Although Huawei does not own any manufacturing facilities for now, it is going to be one of the most important companies in driving China's semi industry due to its products in end-markets such as networking, artificial intelligence computation, cloud, smartphones, IoT and auto," Tammy Qiu, an analyst at Berenberg, wrote in the report in September.

PXW is backed by the same Shenzhen city government that helped take over Huawei's Honor smartphone division in 2020. The startup acquired enough land in the city to cover more than 30 soccer fields in December, and paid 158 million yuan ($23 million), according to land purchase information and its own website. Satellite photographs show buildings on the site are nearing completion, but what's not clear is what gear will be installed inside them and where the machinery will come from.

The market for chipmaking equipment is dominated by five companies—the Netherlands' ASML and Japan's Tokyo Electron, as well as the US's Applied Materials Inc., KLA Corp. and Lam Research Corp. All of them are subject to complicated regulations that restrict what they can sell to Huawei and other Chinese customers. In general, the American companies are barred from selling gear to Chinese customers more advanced than 14 nanometers—four generations behind the latest technology. US companies can't sell anything to Huawei without a special license.

Applied Materials isn't supplying the Chinese startup, according to a person familiar with the matter. Representatives for Applied and Lam Research declined to comment on PXW. KLA said in a statement that it complies with US trade regulations, including restrictions on individual companies and their affiliates.

ASML, which dominates the market for lithography equipment, declined to say if it is working with PXW and said it's up to customers to disclose their suppliers. A Tokyo Electron representative said the company has not heard of PXW.

PXW is targeting 14- and 7-nanometer manufacturing, less advanced than the capabilities of companies such as TSMC and Samsung, but still a challenge for Chinese chipmakers, according to one person familiar with its plans. It's unclear how PXW could secure such technologies.

Non-American companies like ASML and Tokyo Electron are in murky territory when it comes to companies blacklisted by the US, like Huawei. If their chip-making equipment contains US technology beyond a certain amount, they are restricted from selling to a customer they know works with a blacklisted company, according to Judith Alison Lee, a partner at the law firm Gibson Dunn & Crutcher.

"Foreign-made items may incorporate a de minimis amount of US-origin content"—typically 25%—without falling under the restrictions, she said.

Kevin Wolf, a former senior official at BIS and now a partner at Akin Gump Strauss Hauer & Feld, said that, under today's regulations, companies like ASML and Tokyo Electron can probably produce most of their chip-making equipment without crossing that threshold.

"It's unlikely that the non-US companies would get caught in any of the Huawei-specific rules," he said.

The Biden administration's new restrictions could change that however. They may decide to block foreign companies from selling chip-making equipment to Huawei suppliers if those companies use any American components or software.

PXW has hired a number of senior engineers from chip giants including China's Hua Hong Semiconductor Ltd. and Taiwan's United Microelectronics Corp., according to a recruitment video posted on jobs site Liepin. It has also recruited engineers from Hongxin Semiconductor

Manufacturing Co., a $20 billion chip project that collapsed in late 2020, according to a person familiar with the matter. The young company aims to hit capacity of 20,000 wafers by 2025, the company said on its website, without elaborating on the timeframe.

A Chinese foundry capable of making 14-nm chips might be good enough for Huawei. Many components of networking gear—transceivers, application-specific integrated circuits and switch chips—are made with that technology.

While Huawei's smartphone business has been kneecapped by U.S. sanctions, it is still able to grow its telecom infrastructure business. TSMC dropped Huawei as a customer in 2020, cutting off access to a key manufacturing partner for the chips that go into phones and servers.

PXW could reopen supply channels, the people said, if Washington doesn't take further action. The US Bureau of Industry and Security declined to say whether it has approved or rejected licenses for any equipment makers to supply PXW.

Taiwan's Ministry of Economic Affairs said while PXW has not been placed on its entity list for high-tech exports, no Taiwanese company has declared any shipments to the Chinese chipmaker over the past three years. The ministry added that Taiwan is stepping up efforts to clamp down on Chinese companies poaching Taiwanese talent.

PXW describes itself as an emerging contract chip manufacturer. Its first plant—named by local authorities as a strategic construction project—aims to make chips used in cars, Internet of Things devices and phones, according to the company's website.

The company intends to develop its own technologies because of the "US hegemony" that forced China to come up with its own alternatives, a PXW employee said in a recruitment video. The goal is to make PXW a contract chip-making giant comparable to TSMC or SMIC, China's biggest producer of chips, another employee said in the video.

Huawei will collaborate with domestic chip manufacturers including ones in Qingdao, Shenzhen, Beijing and Shanghai to get components it needs, Berenberg's Qiu said in the September research note.

"Over the next three to five years, Huawei should be able to set up manufacturing facilities and start streamlining the whole semi ecosystem," Qiu wrote. "It is aiming to become a tier one component integrator for the auto industry, leveraging its semi, design and manufacturing capabilities."

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