

China: the future of world trade and the semiconductor industry

Mike Cooke looks at recent political developments in the light of frustrated Chinese attempts to take over western semiconductor companies.

There is a specter haunting world trade — the specter of protectionism. The fear is that this will solidify into trade war, such as devastated the world economy following the 1929 Wall Street crash. And trade war can easily morph beyond metaphorical aggression.

With the US Electoral College win of president-elect Donald Trump and the development of his transition team, the saber-rattling has already begun. At the center of the claims and counter-claims is the position of trade with China. Three of Trump's seven stated election policies on trade mention China by name [www.donaldjtrump.com/policies/trade]:

"5. Instruct the Treasury Secretary to label China a currency manipulator.

"6. Instruct the US Trade Representative to bring trade cases against China, both in this country and at the World Trade Organization. China's unfair subsidy behavior is prohibited by the terms of its entrance to the WTO.

"7. Use every lawful presidential power to remedy trade disputes if China does not stop its illegal activities, including its theft of American trade secrets — including the application of tariffs consistent with Section 201 and 301 of the Trade Act of 1974 and Section 232 of the Trade Expansion Act of 1962."

In addition, according to Trump [Tweet, 6 November 2012, [www.twitter.com/realdonaldtrump/status/265895292191248385](https://twitter.com/realdonaldtrump/status/265895292191248385)], "The concept of global warming was created by and for the Chinese in order to make US manufacturing non-competitive."

In some ways, Trump's rhetoric makes explicit the concerns that have been simmering through Sino-US relations for the past several years at various House and Senate committees and in the executive branch of the US federal government.

Days after the US election, China promised 'tit-for-tat' responses to any moves to impose tariffs on its exports to the USA. "A batch of Boeing orders will be replaced by Airbus," suggested an 'op-ed' in China's Global Times, owned by the Chinese Communist Party's People's Daily. "US auto and iPhone sales in China will suffer a setback, and US soybean and maize imports will be halted. China can also limit the number of Chinese students studying in the US." [www.globaltimes.cn/content/1017696.shtml]

On the other hand, Trump is expected to focus more on deal-making and less on issues such as human rights, in line with his 'America First' priority. Scrapping of the Trans-Pacific Partnership (TPP) trade deal would probably also be welcome in Beijing.

What has this to do with the semiconductor business? Recently, there has been a spate of merger and acquisition activities with Chinese investors seeking to take over US and European companies. Along with concerns about the loss of national control and pride in these entities come considerations regarding defense and security, Trump's "theft of American trade secrets" among them. Further, the dividing line between "Chinese investors", as individuals and corporate entities, and the Chinese government is unclear to say the least. Commercial success often leads to and from close ties with national governments, in China, the USA, and elsewhere.

As the preceding text shows, the US situation is uppermost in many minds in the preparations for the new presidency. But not all the moves have been along the US-China axis. The German Federal Ministry of Economics and Energy reopened review proceedings in October on a "cleared" deal regarding an offer made in May by China's Fujian Grand Chip Investment Fund LP (via German subsidiary Grand Chip Investment GmbH, GCI) to take over Germany's Aixtron SE, a leading producer of metal-organic chemical vapor deposition systems. [www.semiconductor-today.com/news_items/2016/oct/aixtron_241016.shtml]

The German federal government is concerned that Aixtron's security-related know-how, including technology used in defense industries, could be revealed through the takeover. By late October, GCI had received tenders for about 65% of Aixtron shares, meeting the 50.1% threshold needed for the deal.

It's not just the German government that's concerned. The Committee on Foreign Investment in the United States (CFIUS) has informed Aixtron-GCI that it has unresolved US national security concerns regarding the proposed transaction. CFIUS is further recommending that US President Obama should prohibit the transaction and Aixtron-GCI withdraw their notice, abandoning the deal.

Aixtron-GCI have decided not to follow the CFIUS recommendation and, at the time of writing, were

awaiting the President's decision (due in early December).

The companies comment: "GCI and Aixtron plan to continue to actively engage in further discussions to explore means of mitigation that may be amenable to CFIUS or the US President to resolve outstanding US national security concerns or to take other alternative measures that could allow the parties to proceed with the transaction. There are no assurances that CFIUS or the US President will entertain further dialogue with the parties or that the parties will be able to identify and agree to any mitigation or to take alternative measures that will allow the parties to proceed with the transaction."

Another Chinese company with an interest in buying a German company is San'an Optoelectronics Co Ltd, which has had preliminary discussions about acquisition or partnership with laser and LED manufacturer Osram, although no agreements have been reached or proposed, let alone signed [www.reuters.com/finance/stocks/600703.SS/key-developments/article/3451194, www.ledinside.com/news/2016/10/sanan_opto_refute_s_plans_of_acquiring_osram]. Reuters estimated that such a deal would be worth about €7.2bn. However, San'an stressed in early October that only one joint meeting had taken place on the issue. An acquisition could take place in stages, initially of the Osram Opto business, with automotive and specialty lighting being reserved for subsequent deals.

"Chinese investors have been approaching Osram for some time regarding acquisition talks," according to Roger Chu, director of research at market analyst LEDinside. "If San'an Opto intends to acquire Osram, though, it will probably require funding from the Chinese government."

Fuelling the market rumor mill has been reports of dissatisfaction with Osram by its largest 17% shareholder, Siemens. In particular, Siemens is apparently unhappy with Osram's €3bn investment plans for the period up to 2020 that involve setting up a new €1bn 6-inch fab in Malaysia for general lighting and white LEDs, along with €2bn R&D funding targeted at work in areas such as smart city applications, wireless lighting control, laser and organic LED technology.

For its part, Siemens was rumored to be looking to sell its Osram shares to China's Go Scale Capital in September [www.ledinside.com/news/2016/10/government_policy_undertones_in_chinese_investors_interests_in_acquiring_osram]. Previously, in January, Go Scale Capital was frustrated by CFIUS intervention in its attempts to acquire US-based LED maker Philips Lumileds for \$3.3bn.

San'an claims that it is the largest and earliest-established industrial production base for top-quality full-color ultra-high-brightness LED epitaxial wafers and chips in China. San'an also produces compound solar cells and

III-V compound semiconductor devices for microwave integrated circuits and power electronics based on 6-inch gallium nitride facilities. On the optoelectronics side, the company is promoting LED intelligent lighting communication (LiFi), car networking systems and optoelectronic intelligent monitoring products. Production cleanrooms have ratings from level 100 to level 10,000. The company claims annual production of 24 million epitaxial wafers and 300 billion chips, accounting for more than 58% of domestic production capacity, giving it the first place in the China market.

San'an Opto subsidiary Xiamen San'an Integrated Circuit was also reported in March as offering to acquire Taiwan-based power electronics & opto chip foundry GCS Holdings Inc, including its California-based subsidiary Global Communication Semiconductors LLC (GCS, www.gcsincorp.com) for \$226m. This move was rejected by CFIUS in early August.

In response, GCS agreed to set up a China-based joint-venture 6-inch facility for radio frequency, power and fiber optic integrated circuits with Xiamen San'an Integrated Circuit Co Ltd, to be named Xiamen Global Advanced Semiconductor, according to Taipei Times. According to information on the Taiwan Stock Exchange Market Observation Post System (in Chinese, 10 November, translated by google), the expressed purposes of the move are to expand operation scales, enhance profitability and strengthen competitiveness by combining production capacity and technical superiority of both companies. The joint venture also involves Xiamen City, Fujian Province. The registered capital is given as \$4m with 49% (\$1.96m) coming from GCS. Xiamen San'an Integrated Circuit Co Ltd is to make up the remaining \$2.04m in cash (51%). GCS Holdings Inc, the Cayman Islands-registered and Taiwan-listed owner of GCS LLC, put its assets at TWD2.7bn (~ \$80m) in its 31 March financial report.

GCS produces photodetectors and vertical-cavity surface emitting lasers (VCSELs) based on indium gallium arsenide technology. Wafer foundry services include gallium arsenide and gallium nitride radio frequency electronics, indium phosphide heterojunction bipolar transistors, gallium nitride power devices, and optoelectronics. Its production capacity is presently based on 4-inch wafers. One motivation for working with San'an was to expand into 6-inch production.

As is usual in such cases, mergers and acquisition activity strengthened share prices in the target companies, which then fell as the deals met with government obstructions. An interesting connection between the San'an group of manoeuvres and the attempted GCI-Aixtron deal was San'an failing to qualify an Aixtron's AIX R6 metal-organic chemical vapor deposition system as part of a multi-system order in early 2016. In addition to truncating the order, Aixtron's shares fell in value, putting the business under pressure. ■

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