



China rapidly moving to the forefront of the global electronics sector

By [Rob Cockerill](#) | 27 July 2017

In a market benefiting from a welcome wave of evolution over revolution, there is still one aspect of the global microelectronics business that is the subject of transformation – China continues to rapidly rise to the forefront of electronics sector hubs.

SEMICON West 2017 was held in San Francisco (US) earlier this month (July) and provided a wealth of key takeaways for those in the business of electronics and materials supply, including the transition from 2D to 3D NAND, the rise of the Internet of Things (IoT), and the EUV technology roadmap.

For Dr. Paul Stockman, Head of Market Development at Linde Electronics, the sector's continuous innovation rather than nervous anticipation of the next big thing was arguably the biggest highlight. This, he enthused, is bringing about a renewed sense of optimism and confidence in the industry.

“Overall, the observation would be that things are very positive. We're in the midst of a cycle that economically is quite positive, and the strongest we've had in recent years, and from a technology point of view I think that things are quite clear for our customers in a way that they haven't been for quite a while.”

But there was one 'next big thing' in particular that is inescapable in the global electronics business right now – China.

“Even though this is a US show, certainly the investment cycle that we see right now in China is a focus for the entire industry, regardless of whether it's SEMICON West or in the

Asia-Pacific region,” Dr. Stockman says. “With the Big Fund and the emphasis that the Chinese government has put on semiconductor manufacturing having more domestic capacity, and developing their own ecosystem for semiconductors, this is driving a lot of the market.”

“What we see is a lot of investment,” he adds, “which Linde has been taking a sizeable portion of for bulk gas and onsite supplies; we’ve invested well over a \$100m in onsite plants for these new customers in semiconductor and display.”

“For us that’s a leading indicator of our business and in electronics specialty gases, we expect that side of the business to develop quite strongly over the next five years as these projects actually progress and build up.”



So is this going to be *the* big electronics hub in the future, **gasworld** asks?

“I wouldn’t say that its going to be *the* electronics hub, but it’s going to be one of the leading ones,” Dr. Stockman responds. “I think it was SEMI that put out the projections that China

will become number two in terms of equipment purchases in the next couple of years as these new projects start to tool up. I don't think that you're going to see Taiwan and Korea fade, they will continue to invest as well, but China will establish itself as one of the top manufacturing centres."

Around half of all new semiconductor fab investments in the next few years will be in China, according to global trade association SEMI (Semiconductor Equipment and Materials International). Meanwhile, **gasworld** Business Intelligence estimates that total sales of gas to China's electronics sector amounted to as much as \$880m in 2015.

Linde is a key stakeholder in this market and increasingly so; gasworld estimates that in terms of Tier One companies, Linde was among the largest players in China with a market share of approximately 16% in the country in 2015. So what is it that the company brings to China's blossoming electronics business?

"What becomes important in China is really the value that Linde has already established for its customers in other regions, which is, having the broadest portfolio of these gases. That means that you can really come to us for the widest variety for these materials," Dr. Stockman says.

"That's also coupled with a very deep product service offering – we're not just there to supply a molecule, we're also there to help educate and support our customers in using these materials, many of which are either toxic or dangerous to use or, because of their chemistry, are just difficult to use and handle and ensure you have the right purity and qualities of the gases when they reach the process. This starts from having multiple suppliers, multiple points of our own value-add in terms of purification and packaging and analysis, but also extends to things like having multiple logistics channels."

"China in particular is a challenging environment to deliver to the customer," he explains. "China is a very large country and the inward logistics are not nearly as established as the outbound logistics. So having multiple ways of getting product to customers is important. It's also important to be able to support them with things like compliance, safety, and on the ground with our own Total Gas and Chemicals Management (TGCM). That means helping customers at the ground level, in their fabs, and actually helping to move materials and to make the hook-ups of the materials to the equipment."