

Local partner. Global expertise. Linde LienHwa's commitment to electronic material supply in Mainland China

The recent initiatives for planned, accelerated electronics growth in Mainland China present many opportunities and a few challenges for Linde LienHwa. 2017 saw an unprecedented number of new semiconductor and display projects launch in Mainland China, and this is on top of very active preceding years in 2015 and 2016. While the scale of the investment does raise questions about risk and capacity, we think China's commitment to the Big Fund initiative is strong. Like all markets with new entrants, Linde LienHwa evaluates projects individually. We also have the opportunity to advise customers in our areas of expertise. Linde LienHwa feels confident in the new customer partnerships we have formed in the past several years, and looks forward to our future growth with them.

Mainland China is the largest single geographic market for electronics materials, and supplying its rapidly growing demand requires experience, scale, and commitment. International chip manufacturers are looking for copy-exact technology transfers, including their materials supplies. Meanwhile, new domestic manufacturers need to start entirely new supply chains. Electronic materials suppliers like Linde LienHwa must meet the needs of both groups with new solutions.

Part of our product offering is on-site nitrogen generators and bulk gas installations, which must be executed at the same time as new fabs are built. Other than silicon wafers, nitrogen is the largest material spend most semiconductor fabs will make over the lifetime of the facility, and it is essential that customers have the best technology available. In this product sector, Linde LienHwa brings industry-leading capability for variable capacity, energy efficiency, and product purity. We have been quite successful in winning our share of this business, and are therefore investing with our new customers from the beginning of the projects.

The on-site and bulk gas installation projects also begin our customer relationship building for sales of the special gas materials, which are used once manufacturing commences. While bulk gas installations are an upfront capital investment agreed with the customer at the start of their project, special gas sales are won and lost every day based upon the value we demonstrate to our customers. As a material supplier, Linde LienHwa is the quality gatekeeper of the supply chain, and we create the quality value between raw material sources and electronics manufacturing.

The Mainland China electronics market is fostering not only new semiconductor and display manufacturers, but also new raw material and production opportunities. Meeting all the electronics materials needs of customers requires a combination of local production investments, established international sources, and developing partner domestic sources to deliver a fully integrated and comprehensive supply chain.

The requirements are not simply the delivery of a material from Point A to Point B. Instead, customers need quality assurance with leading-edge analytical capabilities and ship-to-control practices; product stewardship which ensures safety of materials along their entire life cycle and support for customer facilities; and logistics expertise spanning international and domestic permitting, certification, and business continuity planning.

2018 begins with the tailwind of an exceptional year of expansion throughout the electronics industry, and an unprecedented portfolio of new projects in Mainland China. Linde LienHwa looks forward to

continued growth with our customers, and we remain committed to our motto: Local partner. Global expertise.