

Intelligent innovation, smart factory

Linde (China) builds a smart factory that boosts output by 27%, speeds error detection by 30% and cuts energy use by 28%.



Linde (China) — a global manufacturing leader and a division of KION Group — built a smart factory on a modern hybrid cloud and edge solution from Dell Technologies. With its improved robotic automation, Linde (China) can meet increasing demand for electric forklifts and reduce energy use for itself and its customers.

Transformations



Optimizes data at the edge to drive breakthrough innovation, increases visibility and improves control over the data.



Facilitates real-time communication between hundreds of robots at the edge and AI-powered processes in the cloud.



Automates processes and manages research, planning, ordering and data recovery on one hybrid cloud.

Customer profile



Manufacturing | China Mainland

Outcomes



27% increase in manufacturing output



30% faster detection of process errors



28% reduction in energy usage



12% boost in overall efficiency

A division of KION Group, Linde (China) Forklift Truck Corp., Ltd., is a leading developer and supplier of customizable forklifts. To meet increasing global demand for electric models, Linde (China) Forklift Truck Corp., Ltd. decided to build its first smart factory in Jinan, China, and it engaged Dell Technologies for a comprehensive intelligent automation solution. “Technology is changing fast,” says Benny Zhang, vice president of KION Group IT – APAC, Linde (China) Forklift Truck Corp., Ltd. “The products, designs and processes Dell Technologies recommends help us to be agile and stay ahead of the digitization and automation trends over the next five years, so we can continually improve manufacturing.”

Robotic automation fueled by data at the edge

Today, the smart factory uses robots — including the company’s own autonomous electric forklifts — to receive parts from trucks, store them in racks and move them from storage to the manufacturing line. A seamless hybrid cloud and edge solution from Dell Technologies connects all machines and devices with open technologies and standards. Three types of Dell PowerStore storage platforms guarantee an average 4:1 data reduction, and Dell PowerEdge servers in active-active data centers process and store data at the edge from diverse workloads. This supports manufacturing automation, research, planning, ordering and data recovery.

Anywhere access drives breakthrough innovation

Applications running onsite facilitate continuous, real-time communication between 240 sensors on robots and a virtual control center that maintains a real-time digital twin of the factory in the public cloud. AI-powered processes running on the edge and in the public cloud continuously map the most efficient paths for robots and send instructions for their movements back to the robots’ sensors. Factory employees use edge-based Dell OptiPlex XE desktops to monitor the robots and manufacturing processes, which produce 77 types of forklifts with 382 model variants and 10,000 equipment options.



“I know our business and Dell knows technology. Together, we create impressive solutions that save time and energy — and help customers do the same.”

Benny Zhang

VP, KION Group IT – APAC
Linde (China) Forklift Truck Corp., Ltd.

Smart factory boosts output by 27%

By building its hybrid cloud and edge solution with Dell Technologies, Linde (China) Forklift Truck Corp., Ltd. reduces its capital expenses significantly. And compared with the company’s forklift factory in Xiamen, overall efficiency at the Jinan site is 12% faster. The smart factory produces 27% more products with extensive customization options, and operators can detect manufacturing errors 30% faster because they can instantly test and monitor processes.

Data-driven intelligence cuts energy usage by 28%

The smart factory’s use and production of electric forklifts reduces its carbon footprint and cuts energy usage by 28%. Intelligent automation optimizes the forklifts’ movements, and they require zero gas. Additionally, the site’s modern infrastructure reduces emissions by minimizing the IT footprint and power use. “My life is easier by working with Dell Technologies,” Benny concludes. “I know our business and Dell knows technology. Together, we create impressive solutions that save time and energy — and help customers do the same.”

[Find Out More About the Linde Story.](#)

