

集团董事长带队走访考察全球知名“灯塔工厂”

Chairman of Mengtai Group Leads Delegation to Visit World-Renowned "Lighthouse Factories"

6月中旬，集团董事长带队走访了西门子上海开关工厂、施耐德无锡工厂、江苏时代溧阳新能源工厂、爱柯迪宁波工厂、三一重工长沙工厂等全球知名的“灯塔工厂”，深入工厂车间学习考察标杆企业在自动化、数字化、信息化、智能化等方面的管理实践和创新举措，以及在技术应用、关键绩效指标、核心要素等方面的突出表现，为蒙泰的数字化转型和管理提升汲取智慧、开拓思维。

In mid-June, the Group Chairman led a delegation on a benchmarking tour of several world-class “lighthouse factories,” including Siemens’ Shanghai switchgear factory, Schneider Electric’s Wuxi plant, Jiangsu Times’s Liyang new energy plant, Aikedi’s factory in Ningbo, and SANY Heavy Industry’s manufacturing base in Changsha. The team conducted in-depth walkthroughs of the production lines, studying how these leading companies are pioneering innovations in automation, digitalization, informatization, and intelligent manufacturing. The visits offered valuable insights into cutting-edge technologies, key performance metrics, and core success factors—providing fresh ideas and

strategic inspiration for Mengtai's ongoing digital transformation and management advancement.

灯塔工厂被誉为“世界上最先进的工厂”，代表了全球制造业领域智能制造和数字化的最高水平。中国目前有 78 座，在全球占比近一半，这些工厂代表了中国制造业先进的生产实践和创新能力，在生产效率和产品质量上树立了新标准，在推动供应链优化、资源配置和环境可持续性方面发挥引领作用，通过集成创新技术和方法，为整个行业提供了可借鉴的经验和模式。

Lighthouse factories—often described as the most advanced manufacturing sites in the world—embody the pinnacle of smart manufacturing and digital transformation in the global industrial landscape. With 78 such sites, China is home to nearly half of all lighthouse factories worldwide. These cutting-edge facilities reflect the strength of Chinese manufacturing in both operational excellence and innovation. They are setting new benchmarks for productivity and product quality, while also leading the way in supply chain optimization, resource allocation, and environmental sustainability. Through the integration of breakthrough technologies and modern management practices, they are providing replicable models and valuable lessons for the industry at large.

考察组首站来到了西门子上海开关工厂，这是西门子在中国最大的中压工厂之一，主要生产真空断路器、开关柜等中压开关

设备，以高品质、高安全性著称，是西门子全球标杆工厂，也是“上海市智能工厂”。

The delegation's first stop was Siemens' Shanghai switchgear factory—one of the company's largest medium-voltage manufacturing sites in China. Specializing in vacuum circuit breakers and switchgear, the factory is known for its exceptional quality and stringent safety standards. It is not only a global benchmark within Siemens' network but also officially designated as a “Smart Factory” by the city of Shanghai.

据现场负责人介绍，该工厂不断升级核心部件，引入先进自动化技术，实现了生产、配送、焊接等全流程自动化，帮助工厂产量增倍的同时实现人员减半。而高度自动化的背后离不开大大小小的数字化生产管理系统，包括资源管理、制造执行、高级排程、设备联网、仓储管理、质量管理等系统，各系统充分集成协同，服务于整个业务流程。工厂还通过多种物流机器人及 AI 智能调度，达成全场景机器人串联与全链路物流信息化管理。

According to the site manager, the factory has continually upgraded its core components and introduced cutting-edge automation technologies, enabling end-to-end automation across production, distribution, welding, and more. As a result, the facility has managed to double its output while cutting its workforce in half. This high level of automation is underpinned by a suite of digital

production management systems—including resource planning, manufacturing execution, advanced scheduling, equipment connectivity, warehouse management, and quality control. These systems are tightly integrated, working seamlessly across the entire operation. Additionally, the factory uses a fleet of logistics robots and AI-powered dispatching tools to achieve robotic collaboration and full-chain logistics informatization across all scenarios.

走进施耐德无锡工厂，占地 2000 平米的仓库令人印象深刻。入库区、配料区高耸的十层仓库正在有条不紊地运行，入库区的立库完全由机器自动作业；配料区则是半自动、半人工的方式。如此规模的仓库，仅有 5 位来料检验员，他们管理着 5 万种原物料，服务 350 个供应商。

Stepping into Schneider Electric's Wuxi plant, the 2,000-square-meter warehouse leaves a strong impression. Towering ten-level storage systems in the receiving and kitting areas operate with seamless precision—the inbound section is fully automated, while the kitting zone uses a hybrid of automation and manual handling. Remarkably, this vast operation is managed by just five incoming material inspectors, who oversee 50,000 types of raw materials sourced from 350 suppliers.

施耐德无锡工厂主要生产变频器及配电中的控制单元，是施耐德电气在中国的首座“端到端灯塔工厂”。所谓端到端，包括

供应链上下游网络，以及从产品开发、物料采购到运营维护各个环节。为了应对多品种、小批量的制造需求，工厂从 2016 年推进数字化转型，建立灵活的生产线，综合采用模块化人机合作工作站、人工智能视觉检测等技术，通过推动全价值链协同和全流程创新，形成灵活的供应链韧性，在供应链管理方面建立独特优势，成为行业标杆工厂。

Schneider Electric's Wuxi plant specializes in manufacturing inverters and control units for power distribution and holds the distinction of being the company's first "end-to-end lighthouse factory" in China. The "end-to-end" model encompasses the entire supply chain—from upstream and downstream networks to every stage of product development, procurement, and operations. In response to the challenges of high product variety and low-volume production, the factory launched its digital transformation in 2016. It has since built flexible production lines using technologies such as modular human-machine collaborative workstations and AI-powered visual inspection. By fostering value chain-wide collaboration and driving innovation across all processes, the Wuxi facility has established a highly resilient and agile supply chain—earning its place as a benchmark factory in the industry.

该工厂在现场管理方面也颇具特色，通过五层管理会议，各层级建立起清晰的组织结构，报告流程少，团队信任强，能够快

速响应和解决现场问题。

The factory also demonstrates a distinctive approach to on-site management. Its five-tier meeting structure ensures clear organizational alignment across all levels, fostering strong team trust and minimizing bureaucratic layers. This enables fast, effective responses to issues on the production floor.

宁德时代有 3 座灯塔工厂，江苏时代溧阳新能源工厂是其中之一，主要从事新能源汽车动力电池的生产制造，拥有材料、电芯、电池系统、电池回收的全产业链核心技术，是国家级“智能制造示范工厂”。

CATL operates three lighthouse factories, one of which is the Jiangsu Times Liyang New Energy facility. Specializing in the production of power batteries for new energy vehicles, the plant possesses core technologies across the entire value chain—from raw materials and cell manufacturing to battery systems and recycling. It is officially designated as a national “Smart Manufacturing Demonstration Factory”.

在这里，人工智能技术能够根据温度、湿度以及室外的气象数据，结合机器温度、原料状态，动态调整车间环境；在锂电池制造检测环节，8 台高精度 CCD 相机拍照，AI 瞬间看得懂图中缺陷，实时反馈给生产系统，自动纠正偏差。

At this facility, AI dynamically adjusts the workshop

environment by analyzing temperature, humidity, and outdoor weather conditions alongside machine temperatures and raw material statuses. During lithium battery inspection, eight high-precision CCD cameras capture images, which AI instantly analyzes to detect defects. The system then provides real-time feedback to the production line, automatically correcting any deviations.

智能化创造了巨大的综合效益，帮助工厂减少了 600 多个人工操作点，产能提升了 3 倍多，成本下降了三分之一，碳排放减少了近一半。智能化还极大地提升了产品质量，其单体电芯失效率从百万分之一降到十亿分之一。

Smart automation has delivered significant comprehensive benefits, enabling the factory to eliminate over 600 manual tasks, triple its production capacity, cut costs by one-third, and reduce carbon emissions by nearly 50%. It has also dramatically enhanced product quality, with the failure rate of individual battery cells improving from one in a million to just one in a billion.

爱柯迪是我国汽车铝压铸件制造领域的“隐形冠军”。2016 年，爱柯迪宁波工厂启动“精益数字化工厂战略”，基于 4G、光纤等网络手段开展信息化改造，实现车间数据、排产调度、资源管理等全流程的数字化。

Aikedi is recognized as a “hidden champion” in China’s

automotive aluminium die casting industry. In 2016, its Ningbo plant initiated a “Lean Digital Factory Strategy,” leveraging 4G, fiber optic networks, and other technologies to modernize its information systems. This transformation enabled full digital integration of workshop data, production scheduling, and resource management across all processes.

在爱柯迪宁波工厂进门处有一块大屏幕，上面可以看到整个工厂的实时运行状态和设备工况。工厂负责人向考察组介绍，宁波工厂是国内首个全 5G 智慧工厂，占地 100 亩的厂区，没有一根网线，全部使用 5G 网络保障工厂通信，厂房里的熔炼炉、压铸机、工业机器人等 200 余台设备，通过移动 5G 网络全部接入到 5G+云网融合工业互联网平台。在工业大脑赋能之下，智能化的生产过程管理系统使所有工序都在自动化生产线上完成。数据分析平台帮助制订科学的生产计划，并有效控制产品生产过程质量。三维数字孪生技术还能帮助管理者在云端再造工厂、车间、设备的全视角实时场景。

At the entrance of Aikedi’s Ningbo plant, a large screen displays real-time factory operations and equipment status. The plant manager explained to the visiting delegation that this is China’s first fully 5G-enabled smart factory. Spanning 100 acres, the site operates entirely without network cables, relying solely on 5G connectivity. Over 200 pieces of equipment—including melting furnaces, die

casting machines, and industrial robots—are all connected through a 5G-enabled cloud-integrated industrial internet platform. Powered by an “industrial brain,” the intelligent production management system automates every stage on the production line. A data analytics platform supports scientific production planning and ensures strict quality control throughout manufacturing. Meanwhile, 3D digital twin technology allows managers to visualize the entire factory, workshops, and equipment in real time via the cloud, providing a comprehensive, multi-angle view.

全球重工行业获认证的灯塔工厂仅有 2 座，都在三一重工，其中长沙 18 号工厂被称为全球重工行业最先进、“最聪明”的灯塔工厂。

Globally, only two lighthouse factories have been certified in the heavy machinery industry—and both are operated by SANY Heavy Industry. Notably, SANY’s Factory No.18 in Changsha is hailed as the most advanced and intelligent lighthouse factory in the global heavy machinery sector.

遍布工厂的 1540 个传感器和 200 台机器人，每天将超 30TB 的大数据，依托工业互联网系统，帮助工厂 9 大工艺 32 个典型场景实现“聪明作业”，实现“一块钢板进、一台泵车出”的智能制造全要素落地。

With 1,540 sensors and 200 robots deployed throughout the

factory, more than 30 terabytes of data are generated daily. Leveraging an industrial internet platform, the factory enables smart operations across nine key processes and 32 typical scenarios—realizing fully integrated intelligent manufacturing that transforms raw steel plates into finished concrete pump trucks.

该工厂还是工程机械行业首个用数字化手段实时采集、核算碳排放的工厂，借助树根互联“基于工业区块链的智慧碳排放管理平台”，实现碳减排总量降低 8%，碳排放强度是每万元产值不到 0.015t，处于制造业领先水平。

The factory is also the first in the construction machinery sector to employ digital technology for real-time monitoring and accounting of carbon emissions. Leveraging Shugen Internet's blockchain-enabled smart carbon management platform, it has reduced total carbon emissions by 8%. With a carbon intensity of under 0.015 tons per 10,000 yuan of output, the facility stands at the forefront of manufacturing industry standards in environmental performance.

最后一站，考察组来到四川成都的涪州威士忌酒厂，该厂位于中国白酒的黄金产区，拥有得天独厚的优势，采用英国老牌铜蒸馏器制造商麦克米兰打造的壶式蒸馏器，及意大利福来利公司制造的柱式蒸馏器，建立麦芽和谷物两条独立的生产线，满足不同原酒的需求，创造更多不同的风味。

The delegation's final stop was the Laizhou Whisky Distillery in Chengdu, Sichuan, situated in China's premier Baijiu-producing region. The distillery boasts unique advantages, featuring traditional pot stills crafted by the renowned British copper distiller McMillan, alongside column stills from Italy's Forlì company. With separate production lines for malt and grain whiskies, it meets diverse raw spirit demands and crafts a rich array of distinctive flavors.

此次“灯塔工厂”之行，让我们看到了中国制造业企业的杰出代表在智能制造和数字化方面的领跑之姿：高度自动化、数据驱动决策、灵活的生产系统、对新兴技术的快速采纳和应用、可持续发展和环保实践、管理变革和能力构建。当前，蒙泰正在大力推进管理提升和数字化转型，推动公司向现代化创新型企业快速迈进，这些工厂为我们点亮了前行的道路，提供了很多切实可行的思路和方案。

This visit to the “Lighthouse Factories” showcased China's manufacturing leaders at the forefront of smart manufacturing and digital innovation. We observed highly automated operations, data-driven decision-making, agile production systems, rapid adoption of emerging technologies, sustainable and environmentally responsible practices, and transformative management with capability development. As Mengtai pushes forward with management enhancements and digital transformation, accelerating

its evolution into a modern, innovative enterprise, these factories have lit the way—offering us practical insights and actionable strategies to guide our journey ahead.

当下，全球供应链重构，制造业正在向智能化、低碳化全方位转型，打造完善的充满韧性的供应链体系，无疑是企业决胜未来的重要砒码，对于企业的高质量发展至关重要。蒙泰依托煤电能源、围绕全铝产业链建设打造的现代工业产业链，以及现代农牧产业链，在自动化、信息化、智能化方面还有很大的提升空间；蒙泰国内产业与海外事业在技术、管理与商业生态的融合上还需要向更深次推进；蒙泰在精心构建低碳、循环、高效产业链条的同时，还需要进一步开拓思维，与供应链上下游网络企业建立“企业生态圈”，彼此照亮、相互成就，共同打造中国智能制造的灿烂明天。

Currently, with the global supply chain restructuring, the manufacturing industry is undergoing a comprehensive transformation toward intelligence and low carbon. Building a resilient and complete supply chain system is undoubtedly a critical factor for enterprises to win in the future and is vital to their high-quality development. Mengtai, relying on coal and power energy and focusing on the construction of a modern industrial chain around the all-aluminium industry chain and modern agriculture and animal husbandry industry chain, still has great room for

improvement in automation, informatization, and intelligence. The integration of technology, management, and business ecology between Mengtai's domestic industries and overseas operations also needs to be advanced to a deeper level. While carefully building a low-carbon, circular, and efficient industrial chain, Mengtai needs to further broaden its thinking and establish an "enterprise ecosystem" with upstream and downstream supply chain network companies, illuminating and empowering each other to jointly create a brilliant future for China's smart manufacturing.