

■ Project Implementation

COSMOPlat Smart Energy has applied smart energy practices to Haier Sino-German Park to build a green and low-carbon industrial park, which is expected to achieve carbon emission reduction and reduce energy consumption, and effectively solve the regulatory pain points caused by the lack of digitalization in energy management.

Through intelligent O&M and fault warning, the efficiency of equipment O&M is improved and the safety of energy consumption is ensured. The energy consumption is reduced through energy efficiency evaluation and optimization. Through digital carbon management methods including the formulation of dual-carbon planning, the deployment of carbon asset management platform, carbon inventory verification, product carbon footprint tracking, carbon reduction path planning and dual-carbon achievement certification, the park can realize the clear, managed and controlled carbon assets. At present, on the basis of carbon emission quantification, analysis, management and report generation, the platform also realizes the online certification of the carbon footprint of the organization and products, and obtains the verification certificate online, which greatly shortens the verification cycle and saves the user's time and cost. The platform also carries out real-time monitoring and systematic management of carbon emission reduction data, quotas, carbon assets, etc., providing users with a transparent, visual and controllable energy management experience, improving management level and operational efficiency, and creating economic and environmental benefits. After the transformation and upgrading, the energy meter data can be automatically obtained in real time, and the multi-level energy management and control of the group, factory, production line and equipment can be realized, as well as all-round and multi-dimensional statistical analysis of energy consumption.

In terms of energy saving and efficiency improvement in production, Haier COSMOPlat Smart Energy designed a smart control system for the air compressor station for Haier Smart Park, unified the configuration of the gas supply pipeline network of several plants in the park, started the corresponding equipment according to the production intensity requirements, and equipped it with high-precision detection modules and measuring instruments to realize the constant pressure gas supply of the air compressor station., reducing the energy cost by about 1.2 million RMB/year.

In terms of clean energy substitution, by changing the original energy supply model, vigorously reducing fossil energy, using clean energy substitution, the clean energy use rate reached 41%. The construction of rooftop distributed photovoltaic power generation system has been completed on the roof of 130,000 square meters of parkland, with a total installed capacity of 13.5 megawatts, and an annual power generation capacity of more than 15 million kWh.

In terms of comprehensive energy utilization, the gas trigeneration system designed for the park uses natural gas as fuel, and this system produces electricity, steam, air conditioning cold source, domestic hot water and other products through the combination of lithium bromide units, electric refrigeration units and gas boilers, and realizes the cascade utilization of energy in the form of combined cooling, heating and power. In addition, Haier Industrial Park has also built projects such as VOC online monitoring, magnetic levitation refrigerators, energy efficiency improvement of injection molding machines, and optical storage and charging carports.

As a comprehensive energy service model project built by Haier COSMOPlat Smart Energy, the smart energy platform built in Haier Sino-German Industrial Park can carry out centralized and intuitive dynamic monitoring and digital management of the whole process of production, transportation, distribution and use of energy, such as electricity, water, gas, heat, compressed air, sewage treatment, fountains, photovoltaics, lighting, elevators, etc., to control and dispatch the energy system of the park and improve the overall efficiency.

■ Project Impact & Sustainability

1. Project Influence: Leading the transformation of the industry to modernization: The construction and management project of Haier Sino-German Industrial Park uses

digital, green and intelligent technologies to transform and upgrade traditional industries, and through real-time monitoring, intelligent analysis and optimized control, the project provides a scientific energy and carbon management strategy for the industrial park, improves energy efficiency and equipment operation stability, reduces the risk of failure, and ensures safe production. The integration and application of these technologies not only improves the energy management efficiency of the park, but also significantly reduces energy consumption and carbon emissions.

Contribute to the national dual carbon goal: Through the use of clean energy such as photovoltaic power generation and the improvement of comprehensive energy utilization efficiency, the annual carbon dioxide emission reduction is about 32,000 tons.

2. Scalability: Kaos Energy Technology Co., Ltd.'s online digital platform + offline green scene business model, serving Haier Group internally, empowering more than 700 users externally, with a cumulative energy saving and cost reduction of 200 million yuan, and participating in the formulation of relevant group standards for national zero-carbon factories and zero-carbon parks as a participating unit. Haier Sino-German Industrial Park has achieved a comprehensive energy utilization efficiency of more than 80% through Kaos's full-process energy solution. The park's smart energy management and green development concepts are not only worthy of reference and learning from the manufacturing industry, but also have applicability in other industries.
3. Sustainability: Smart energy management: Relying on the Kaos smart energy platform, Haier Sino-German Park combines artificial intelligence, big data, cloud computing, 5G network and other technologies to help the "four flows in one" of energy flow, data flow, information flow and carbon traceability flow, and improves and optimizes the energy balance through centralized and intuitive dynamic monitoring and digital management of the whole process of energy and power production, transmission and distribution in the park.

Supply chain collaboration and continuous improvement and innovation: Haier Sino-German Industrial Park is committed to using itself as a model to cooperate with upstream and downstream suppliers for green transformation. In the future, we will continue to improve our energy and carbon management model, continue to apply carbon reduction technologies and develop low-carbon products, meet market demand, and establish corporate responsibility.

■ Expert Comments

Leveraging the capabilities of its subsidiary, COSMOPlat Energy Technology Co., Ltd., Haier Group has provided a comprehensive energy and carbon management solution through a digital platform that facilitates data collection, storage, processing, and analysis. This solution enables holistic management of energy use and carbon emissions across industrial parks. One notable feature of the case is the cloud-based control system for air compressor stations, which includes waste heat recovery and frequency conversion upgrades for water pump motors, yielding an annual cost reduction of approximately CNY1.2 million. Additionally, rooftop distributed photovoltaics have been installed, reducing fossil fuel use and generating over 15 million kWh of electricity per year. Integrating advanced technologies such as AI, big data, cloud computing, and 5G network, this solution achieves the "integration of four flows"—energy flow, data flow, information flow, and carbon tracking flow. Through centralized, visualized dynamic monitoring and digital management of energy production, transmission, distribution, and utilization, it enhances and optimizes energy balance, and boosts comprehensive energy utilization efficiency to over 80%. The project also results in annual carbon dioxide reductions of approximately 32,000 tons, equivalent to afforesting 13,300 mu (or 886.67 hectares) per year. With its scientific foundation, practicality, and scalability, this solution stands as a benchmark in corporate energy conservation and carbon reduction.

