ISO 50001 Energy Management System
Case Study

2020 China

Far East Composite Technology Co., Ltd.

Include caption

1、Won the "12th Five-Year Plan" advanced group of energy-saving work in Wuxi in 2016

2、Won the Wuxi City energy-saving and low-carbon technology promotion and application demonstration unit in 2016

3、Won the Outstanding Informatization Project of Wuxi in 2018

4、Won the outstanding enterprise of integration of two industries in Jiangsu province in 2018

5、Won the Yixing Intelligent Manufacturing Demonstration Enterprise in 2018

6、Won Jiangsu Industrial Internet Demonstration Project in 2019

7、The aluminum alloy energy-saving power transmission line designed and manufactured by the company won the second prize of national scientific and technological progress in 2019

Case Study Snapshot	
Industry	Manufacturing
Product/Service	Wire and cable
Location	Yixing,Jiangsu
Energy management system	ISO 50001
Energy performance improvement period, in years	Total number of years for which energy was improved
Energy Performance Improvement (%) over improvement period	2%
Total energy cost savings over improvement period	Convert to 6900000 USD
Cost to implement EnMS	Convert to 4140000 USD
Total Energy Savings over improvement period	79132 GJ
Total CO_2-e emission reduction over improvement period	12025 Metric tons

Company Profile:

Located in Yixing City, the pottery capital in Yangtze Delta Economic Circle with thousands of years' history, Far East Composite Technology Co., Ltd. boasts registered capital of RMB 619 million and covers an area of 350mu with building area of 190,000m2. It is a wholly owned subsidiary of Far East Smarter Energy Co., Ltd. (stock code: 600869), China's leading enterprise in wire and cable industry.

The company is dedicated to the R&D and production of ultrahigh voltage, double capacity carbon fiber reinforced composite core series conductors, high and medium-strength aluminum alloy conductors, heat-resistant aluminum alloy wires, aluminum-clad steel-cored aluminum stranded conductors and other series of products. The company has already mastered technologies like the design lines, product R&D, production, testing, installation, and layout of carbon fiber composite conductors. Through cooperation with the United Kingdom, Canada and other partners in technology development of composite products in the field of power transmission, and industrial development with Shanghai Electric Cable Research Institute, Xi'an Jiaotong University and other institutes, the company has fundamentally tackled the technical bottlenecks in the development of power transmission systems, and further driven the development of power field toward high-tech, large-capacity, large span, long distance, safety, environmental protection and energy saving.

Since its inception, the company has passed IS09001 Quality Management System Certification, IS014001 Environmental Management System Certification and OHSAS18001 Occupational Health and Safety Management System Certification. It has obtained 288 patents, including 31 invention patents. It is a state-level high-tech enterprise with more than 300 sets of imported and domestic advanced production lines and advanced equipment.

The existing energy types of the company mainly include: electric power, natural gas, washed coal, water, steam, compressed air. The annual comprehensive energy consumption is about 13000tce. Leaders at all levels of the company attach great importance to energy conservation and emission reduction. More than 4 million yuan is invested in the company's energy-saving transformation projects every year, and the annual energy-saving income can reach more than 7 million yuan.

Implementation of Energy Management:

（1） Attach great importance to, strengthen leadership, and comprehensively deploy energy conservation and consumption reduction.

In 2008,the company established a general manager as the group leader,and a deputy general manager (manager representative) as the deputy group leader.The director of the equipment and power department is fully responsible for the specific implementation,and the production plant leaders and department heads are members to save energy and reduce consumption.The work leading group is equipped with dedicated staff to coordinate and arrange energy saving and consumption reduction work.The testing and measurement center is specifically responsible for energy measurement and calibration, which has achieved sound institutions,responsibilities to people, and effective operation.At present, a total of two professional energy management personnel have obtained the energy management division, and one has obtained the energy administrator qualification. "Certificate on the job" ensures the quality of energy management personnel and promotes the strict implementation of corporate energy conservation and consumption reduction regulations.

（2） Strengthen management, strengthen responsibilities, under the dual management of energy saving and consumption reduction rewards and assessment.

In order to implement the energy saving and consumption reduction work, the company formulated the "Energy Saving and Consumption Reduction Work Plan" and "Energy Management System" in 2009. Through the improvement of the system year by year,the various energy consumption evaluation indicators were refined.The energy-saving and consumption-reduction goals were decomposed and implemented layer by layer, and the energy-saving and consumption-reduction was linked to employees' salaries, promotion, and job title evaluation, so as to achieve full participation and improve the energy-saving and consumption-reduction awareness and motivation of all employees.An energy management system was established in 2014 and continues to operate effectively.The company strengthened employee training, extended the training class to the production line, and used the pre-class meetings and weekly meetings to publicize the significance and importance of energy conservation and emission reduction, and guided all employees to establish energy conservation awareness.By promoting the implementation of clean production projects and sharing energy-saving improvement experiences, the solidification results are promoted to achieve the goals of energy conservation and consumption reduction.

(3) Focus on key points, firm goals, and increase investment in energy-saving technological transformation.

1. In recent years, the company has accelerated the elimination of backward drawing equipment with high power consumption and low energy consumption and high energy consumption. It has been updated to a high-efficiency double-head continuous drawing equipment, which has increased the efficiency by three times. Twisting machine replacement, the efficiency has increased by 2 times; inefficient transformers, air compressors and a large number of backward motors have been eliminated.

2. All the company's street lights, cable field night lighting spotlights, and workshop lighting have completed the transformation of LED lights.

3. The centralized control and frequency conversion of the air compressor station has reduced the no-load energy consumption of the air compressor and improved the quality of compressed air.

4. Construction of a power monitoring and management platform. By the end of 2019, the construction of 109 monitoring points has been completed, and full coverage of key energy-using equipment has been achieved.

5. In 2014-2018, the company built a total of 4.7MW photovoltaic power stations, which were connected to the grid for power generation after boosted by the inverter, with an annual power generation of 3.5 million kilowatts.

6. The electromagnetic induction heating transformation of the extruder can save more than 30% of electricity; through the improvement of product technology, the use of ultraviolet light crosslinking instead of traditional warm water crosslinking reduces steam loss and saves 800,000 yuan in annual steam costs.

7. From 2018 to 2019, the company organized the implementation of intelligent workshop transformation. From 1 of the company's 6 workshops,a workshop with a relatively high level of automation was selected to implement the intelligent transformation.The transformation content is as follows:1) Virtual-actual linkage:Using dynamic modeling technology,you can directly see the actual production situation on the big screen.2) Interconnection:A workshop-level industrial Internet system has been established,and all equipment in the workshop has achieved interconnection and data sharing.3) Data collection: Each process uploads the collected data to the SCADA system in real time online through various sensors and online detection equipment.4) Data analysis:The SCADA system automatically organizes and analyzes production scheduling, quality monitoring,equipment operation data,and energy consumption data to the mobile phone

of management personnel at all levels to provide management decision basis.5)Intelligent logistics:SRM/WMS/MES/EBS and AGV intelligent trolleys have completed network integration,which has realized controllable and intelligent material distribution in the entire workshop.Transformation effect: The number of people has been optimized from 128 to 89, the per capita output value has increased by 28%, the product qualification rate has increased from 99.6% to 99.85%, the manufacturing cost has decreased by 1.7%, and the inventory pressure has decreased by 33% through intelligent scheduling and cycle production.

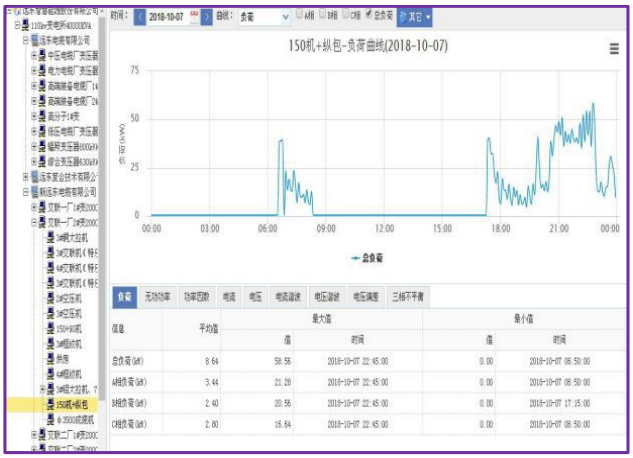
(4) Looking ahead, transforming and innovating, and constantly tapping the potential of energy conservation and consumption reduction.

The intelligent workshop project has been implemented for two years, and there is still much room for improvement. In the next 1-2 years, we will continue to work with Siemens to further explore the potential. APS intelligent production scheduling, MES terminal QR code scanning, quality process online monitoring, equipment status automatic monitoring feedback and other systems will be implemented in succession.Through intelligent transformation, the unmanned and black light factories will be realized. In the next 3-5 years, the intelligent transformation of the whole company will be realized from point to surface.

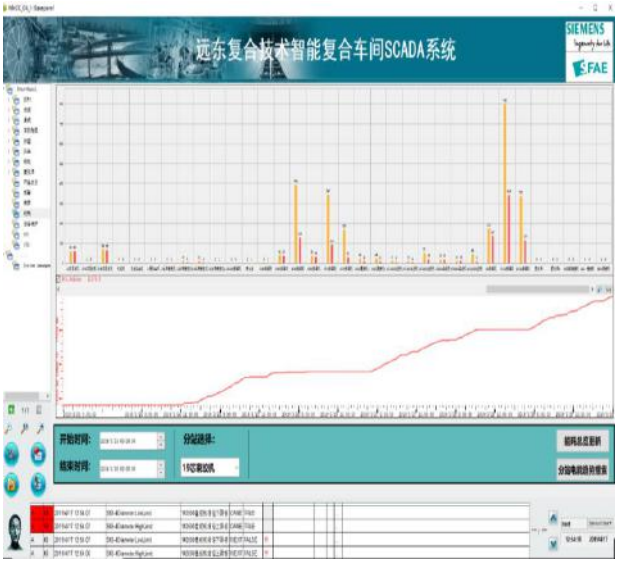
Construction of photovoltaic power station

Equipment frequency conversion transformation

Centralized control transformation of air compressor station

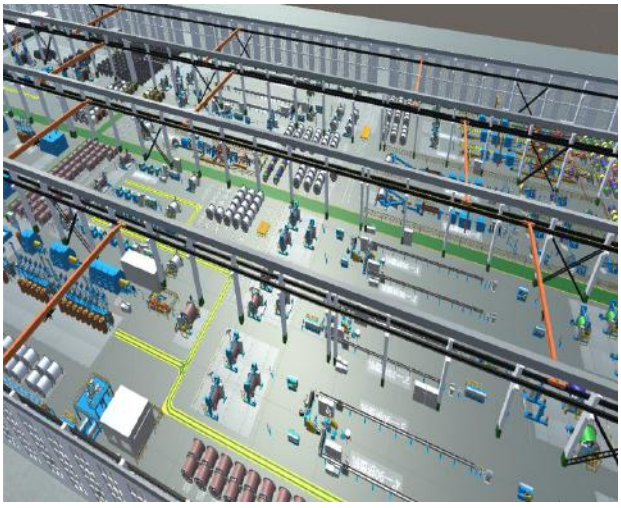


Power monitoring platform



Intelligent workshop----Production scheduling analysis

Intelligent workshop----Equipment data collection



Intelligent workshop----3D modeling

Intelligent workshop--Data analysis of equipment energy consumption

Successful Experience

- A The company actively responds to the call of national energy conservation and emission reduction, establishes and operates the energy management system, organizes and revises the energy system for many times, configures the energy management resources, and incorporates the energy conservation transformation, standardized and reasonable use of energy into the performance evaluation of leaders and employees, urges employees at all levels to pay full attention to it, and does a good job in energy conservation and emission reduction.
- B Strengthen walking management, actively listen to the opinions of the production line staff, sort out and summarize the information obtained, select valuable information to formulate relevant implementation plans, organize the implementation of energy-saving transformation projects, vigorously promote the projects with good implementation effect, and guide the staff to actively participate in energy-saving transformation activities through Project Awards.
- C Actively participate in all kinds of exhibitions and exchange meetings, fully communicate with suppliers, understand the latest equipment and new process at this stage, eliminate backward production capacity, accelerate the update of new equipment and new process, and focus on the energy-saving transformation and daily operation of key energy consumption equipment and energy supply facilities.
- D Continue to be committed to the improvement of intelligent workshop. With the docking of SCADA and MES system and the opening of data transfer flow, equipment operation data, energy data and work order information will be displayed in real time. Through big data statistical analysis, continue to tap the potential of equipment, improve the operating habits of employees, and gradually realize the progress towards unmanned factory and energy Internet.