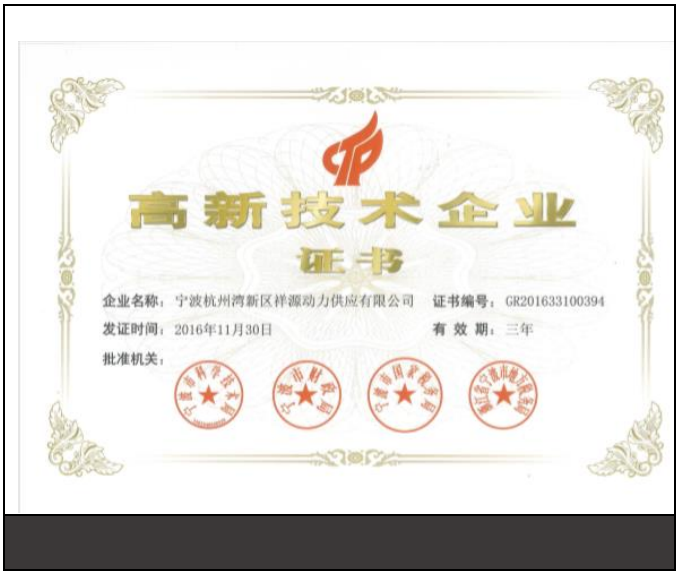
ISO 50001 Energy Management System
Case Study

2020 Add Country Name(s)

Organization Name

Add byline here: e.g., achievement by company or facility.



Organization Profile & Business Case

Founded in November 2011, Ningbo Hangzhou Bay New Area Xiangyuan power supply Co., Ltd. is a modern enterprise dedicated to providing power energy production, transmission and management services for advanced manufacturing industry. It is always user-oriented, developing and utilizing various energy-saving technologies and regional energy centralized and coordinated management advantages to ensure reliable, efficient and environmental protection supply of energy. The company has successively passed the four system certification of environment, quality, occupational health and safety, and energy management, and was rated as a national "high-tech enterprise".

As a professional comprehensive energy center planning, management and energy supply enterprise, Ningbo Sunriver's business scope mainly covers energy supply, transportation and management of automobile manufacturing and semiconductor (chip) industry in the region. In its own energy center sector, energy products mainly include steam, hot water, chilled water, industrial circulating water and compressed air. The production process belongs to energy conversion, and the main energy consumption is electric power. In addition, in the energy service sector, the company mainly provides agent construction services, energy center operation management services, and transformation consulting services for the regional semiconductor (chip) industry integrated energy center.

The company has always implemented the requirements of the "13th five year plan" of the State Council and the "13th five year plan" of the national energy conservation action plan of the national development and Reform Commission and other departments to improve the competitiveness of enterprises and realize the "win-win" of economic and social environmental benefits as the strategic policy, and strive to become a power and energy producer in the automobile manufacturing and semiconductor (chip) industry With the goal of leading enterprises in production and supply, taking the secondary energy supply with quality and quantity guaranteed and the high level of energy conversion efficiency as the advantages, and taking the comprehensive and in-depth development of energy conservation and consumption reduction and energy efficiency improvement as the means, the market value of enterprises will continue to be improved, making contributions to the national energy conservation and environmental protection undertakings.

In 2017, the company passed the iso50001 energy management system, and general manager Fang Zhenghui highly affirmed the achievements made in the three years since the implementation of the energy management system. Through reasonable setting and continuous updating of energy performance objectives,

technical parameter optimization, technical improvement and innovation, shift based energy efficiency management assessment, etc. Technology and management innovation should be carried out simultaneously, and continuous optimization should be carried out. In three years, energy consumption should be reduced by 12%, energy saving by 31896gj and cost saving by 6.2 million yuan.

Business Benefits

In the past three years since the implementation of iso50001 energy management system, Sunriver Ningbo has achieved good results in energy performance, energy cost, carbon emission control and other man-machine and material law and environment related management.

① Achievements in energy performance improvement: through the energy data collection of the whole system hierarchical metering system, the company establishes sub indicators at all levels of management, such as energy cost per unit output value, comprehensive energy performance objectives, compressed air energy performance objectives at the department level, chilled water energy performance objectives, etc., referring to the current energy efficiency of its own equipment and existing advanced energy-saving technologies. Make the management work systematic and clear, and form PDCA closed-loop management. Including annual target plan, monthly index decomposition, completion tracking, continuous improvement measures and a relatively unified and perfect management system.

For example, according to the system composition, the compressed air system of the company has data such as system energy efficiency index and single unit energy efficiency index of each component equipment,. And formed a set of inherent management analysis method. Figure 1

系统	设备	运行时间（h）		产气量(Nm³)		耗电量（KW·h）		电单耗(KW·h/km³)		
	编号	18.12	19.12	18.12	19.12	18.12	19.12	18.12	19.12	环比
低压空压机	1#螺杆机	120	303	10,614,228	14,663,105	1,024,109	1,459,044	96.5	99.5	3.1%
	2#离心机	171	212							
	3#离心机	376	104							
	4#离心机	376	684			77.0%	85.3%			
	5#离心机	376	472							
高压空压机	6#高压机	273	284	1,639,144	1,424,659	224,670	198,472	137.1	139.3	1.6%
	7#高压机	559	279							
	8#高压机	147	318			16.9%	11.6%			
	9#高压机	147	434							
	二厂		0							
干燥机	1#低压	147	785	12,253,372	16,087,764	49,832	16,993	4.1	1.1	-74.0%
	2#低压	584	0							
	3#低压	572	452							
	4#低压	533	439							
	5#高压	533	371							
	6#高压	533	260							
	7#高压	526	174							
	8#高压	517	125			3.7%	1.0%			
	二厂		0							
冷却塔循环水	1#循环水泵	513	742	12,253,372	16,087,764	31,692	35,775	2.6	2.2	-14.0%
	2#循环水泵	147	501							
	3#循环水泵	480	114							
	9#冷却塔1组	716	583			2.4%	2.1%			
	9#冷却塔2组	51	575							

Figure 1

② The level of energy evaluation and technology optimization has been improved. In the past three years, 32 energy-saving projects have been completed, involving all kinds of energy, with a total investment of 5.6 million yuan, and good results have been achieved. Up to now, the accumulated energy saving: 8.66 million kwh 3 of electricity, 6.06 million yuan of cost saving, 3464 tons of standard coal, and 8635 tons of CO2 emission reduction.

③ A set of standardized multi energy center networking operation and supply system has been formed. In the application of information data collection and integration technology, the application of energy data has been upgraded to a new level, integrating big data analysis, ai artificial intelligence control, Internet of things and other technologies, expanding new control modes, and effectively applying them to the traditional energy center operation industry, and further improving the traditional personnel control It has a very high promotion value. Figure two

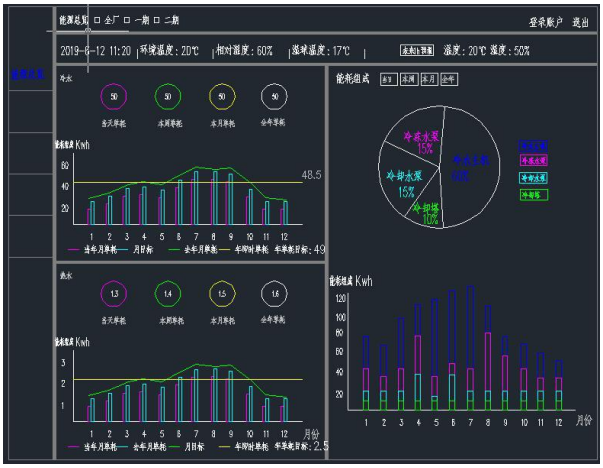


Figure two

④ In terms of social benefits, the company's energy management system has promotion value. In the automotive industry and semiconductor (chip) industry, the utilization efficiency of energy is still not optimistic. In addition to the factors that the popularization and application of energy-saving technology of host equipment manufacturers are not enough, the low level of internal energy management is also one of the important reasons.

Plan

The development and implementation of energy management system is a part of the effective implementation of management methods. It is a way to realize the transformation from offline management to online management, from energy index management to energy value management, and from source and process management. Plan management is carried out from the aspects of organization determination, data application and control, personnel management, analysis, evaluation and assessment. Organize to determine and establish a three-level management network, establish an energy committee at the company level, establish a special energy-saving technical team at the technical level, establish an implementation and regulation team at the operation and maintenance department, establish an energy monitoring team and other departments, and establish an energy management network. Data application and control, standardize the management of energy metering equipment and statistical process, improve the accuracy of energy statistical data, and provide data support for energy management and control. Personnel management, carry out qualification training for energy administrators and professional auditors, and do a good job in the publicity of "everyone is an energy supervisor". Analysis, evaluation and assessment, energy analysis and decision-making system, including energy saving target management, energy index statistics and query, energy index analysis, product energy consumption calculation and analysis functions. In terms of cost, comparison of energy cost and energy saving, state evaluation of all energy metering facilities of metering system, etc.

Do, Check, Act

1. Organization

Through the establishment of energy management system, the company strengthened the overall management of energy, formulated energy management manual and a series of documents, implemented the concept of sustainable development, based on science and technology, and clarified the company's energy policy: advocating high efficiency, technology first, management according to law, full participation, energy conservation and consumption reduction, continuous improvement, pursuit of excellence, mutual benefit and win-win. In order to better serve the enterprise and improve the energy efficiency level, the company established a special energy management committee to regularly analyze the energy indicators and phenomena, analyze the causes of unexpected parameters and formulate solutions.

The energy management committee is composed of leaders of the company and managers, engineers and supervisors of all departments. The general manager shall be the decision-maker and master the decision of major issues; the deputy general manager

shall be the team leader to organize, coordinate and supervise the implementation of relevant work. The personnel in charge of technology, production and management of each department are team members, who are specifically responsible for the organization and implementation of the work, data statistics, statements and the summary and analysis of relevant data.

2. Energy review and planning

The company has established an energy review group composed of professionals in energy management, power, technology, equipment, procurement, production control, etc., which is subdivided into energy regulations review group, energy management review group and energy utilization review group according to the different emphasis of the review contents, and the responsibilities and work progress of each review group in the energy review are clarified.

Energy statistics is stipulated in the company's management system. The energy administrator (with the post certificate of the statistician) is responsible for the collection, sorting, summary, analysis and reporting of the company's energy consumption data, establishes the energy account, and makes monthly statistics of all kinds of energy input and output of the company's station buildings. The monthly energy meeting is held to comprehensively analyze the completion of relevant indicators, put forward improvement suggestions, make decisions and control various indicators. 12 energy management personnel are invested, with an annual energy management fund of 5 million yuan.

3. Input and output analysis of energy management

In order to analyze the energy consumption more clearly and find out the key points of energy consumption control, for the power consumption equipment with rated power greater than or equal to 10kW, there are independent meters, which adopt three-level measurement method and check step by step, and the power loss is controlled within 2%. Different forms of flow meters are used for different energy sources, and all equipment involved in the measurement management are regularly calibrated, with an annual instrument calibration cost of nearly 1 million. When the energy data acquisition system is put into use to monitor all kinds of energy, data quantitative analysis is carried out at the same time. The system maintenance cost is 400000 / year. Zhejiang University, Tongji University and Tsinghua University are required to come to the company to carry out energy-saving concept publicity activities, and provide energy-saving transformation scheme according to the site conditions. Invite the system certification agency to certify the company's energy management system.

4. Energy performance evaluation

The technology department is mainly responsible for the technical management of main energy consuming equipment, the establishment of energy consumption indicators, the establishment of energy benchmarks and energy performance parameters, the formulation of process standards, the establishment of energy-saving measures and plans, the evaluation of energy-saving, and the monitoring of energy and equipment. The energy administrator (with the post certificate of statistician) is responsible for the collection, sorting, summary, analysis and reporting of the company's energy consumption data, establishing the energy account, and monthly statistics of all kinds of input and output energy of all station buildings. In statistics, statistics can be basically carried out according to the four links of energy purchase, transmission, conversion and use, and the data format, unit and caliber can be unified to meet the needs of daily analysis.

Hold energy meeting every month to analyze and summarize the energy supply of last month. Monthly energy meeting is held to comprehensively analyze the completion of relevant indicators, put forward improvement suggestions, make decisions and control various indicators.

5. Energy performance improvement

The company's annual energy consumption and output indicators are formulated by the technology department according to the previous year's energy supply. Based on the indicators, the indicators are divided into monthly shipping and maintenance department. The operation and maintenance department divides the monthly indicators into small shifts according to the actual situation each month. The person in charge of small shifts controls the operation management of each shift according to the indicators. Monthly energy special meeting is the main form of daily management. The participants include technical department, operation and maintenance department and other key personnel specially responsible for management, technology, operation and maintenance, and the energy administrator conducts year-on-year and month on month benchmarking display of energy consumption and various energy unit consumption indicators. There are all staff to analyze and discuss the current situation. Put forward feasible energy-saving suggestions, arrange relevant departments and personnel according to the time nodes according to the specific work requirements in the spirit of the meeting, and review the work content and completion of the last meeting at each meeting.

6. Operation control and continuous improvement

Every year, the company customizes the energy-saving technical transformation scheme for the internal energy consumption equipment or system of the company, and gradually reduces the energy consumption level of the company from the point of view. At the same time, in order to standardize the management of the company's internal energy conservation and consumption reduction behavior, the company has developed an energy management manual, 49 energy related procedure documents and operation instructions, and reviewed these documents every year to ensure the effectiveness and practicability of the documents. The company establishes corresponding and effective energy use, measurement, statistics, analysis, adjustment and assessment management system, and each department has its own relevant functions, which are mutually constrained and supervised. The operation and maintenance department is mainly responsible for energy supply, establishment of energy consumption account, statistics, analysis, quality test and statistics of energy raw materials, maintenance of main energy consuming equipment and implementation of energy-saving projects; the company conducts skill training for operators of key energy consuming equipment every year, focusing on basic principles of process system, equipment operation procedures and energy-saving measures formulated by the company.

7. Professionals and communication

Sunriver has 1 energy management personnel, 1 measuring instrument administrator and 22 key energy equipment operators. Operators of key energy using equipment are divided into refrigeration machine, heat exchanger and air compressor operation posts, all of which have obtained national recognized post operation certificates and receive regular training. The company conducts skill training for operators of key energy using equipment every year, focusing on the basic principles of process system, equipment operation procedures and energy-saving measures formulated by the company.

Conduct close communication with brother companies around the world, hold foreman forum and technical forum every quarter to summarize and exchange operation strategy, energy saving measures and energy-saving technology innovation, participate in technical training of manufacturers and improve professional skills, invite energy-saving companies to come to the company for communication and progress, publish internal source power journals to collect excellent energy-saving cases and relevant excellent energy-saving technologies of brother companies Change the case.

8. Tools and resources

Put the energy data acquisition system and energy management system into use, track the real-time energy use status of each region, monitor the operation conditions of each energy using equipment, realize the automatic generation and export of energy reports, and

realize the energy cost report through kinetic energy analysis and comparison. At the same time, it has the function of historical data query, which is convenient for review and analysis.

Participate in the energy-saving press conference organized by the government; invite consulting companies to review the company's energy supply; invite energy-saving companies to conduct field visits to the energy center and provide energy-saving transformation plans; invite scientific research institutions such as Zhejiang University, Tongji University, Tsinghua University, Shanghai Institute of mechanical and electrical engineering to teach the latest energy-saving measures and management plans.

Transparency