

# ISO 50001 Energy Management System Case Study

China



Include caption

## Organization Profile & Business Case

Shandong Shanshui Cement Group Co., Ltd. (referred to as Shanshui Group) is a large enterprise group with cement and clinker production as the leading industry, which integrates the production and sales of merchants, pipelines, plastics and aggregates. It has more than 100 subsidiaries. At present, Shanshui Group has a total cement production capacity of more than 100 million tons.

Yishui Shanshui Cement Co., Ltd. is a key subsidiary company of Shanshui Group with an investment of 450 million yuan. The company has built a clinker production line with a daily output of 4600 tons and a 9MW waste heat power station, which is one of the most advanced clinker production lines in China. In recent years, the company has always adhered to the scientific and rational use of energy, constantly

improve the construction of energy management system, adhere to management and technological innovation, in-depth tapping potential to reduce consumption, improve energy efficiency, and strive to create first-class enterprises. At the same time, we should speed up industrial restructuring, upgrade the scientific and technological content of product industry, improve the energy efficiency level of the company, enhance the competitiveness of enterprises, and promote the rapid and efficient development of enterprises.

*“Add quote from organization about its achievement and success through ISO 50001.”*

—Dong Chuanhui, General Manager of Yishui Landscape Cement Co., Ltd.

**Business Benefits**

In terms of production technology management and scientific and technological progress, the company vigorously promotes technological progress. By introducing advanced production equipment at home and abroad and improving the level of equipment and automation of enterprises, it not only greatly improves the output and quality of products, optimizes the product structure, upgrades the product grade, and makes the energy consumption index of products decline continuously, but also reduces the energy cost.

Shanshui Group has always adhered to the scientific concept of development, with reducing energy consumption and improving energy utilization as the core, and promoted its subsidiaries to continuously carry out technological transformation, adopt new processes, new technologies and new equipment, eliminate high energy-consuming processes and equipment, and continuously improve energy management. Through investment in recent years, our company has achieved remarkable results in comprehensive energy utilization from 2016 to 2017. All energy indicators are lower than the national advanced value and Shandong advanced value, and are in the leading level in the industry.

Case Study Snapshot	
<b>Industry</b>	Building material
<b>Product/Service</b>	cement
<b>Location</b>	Taierzhuang District, Zaozhuang City, Shandong Province, China
<b>Energy management system</b>	ISO 50001
<b>Energy performance improvement period</b>	Total number of years for which energy was improved
Energy Performance Improvement (%) over improvement period	1%
<b>Total energy cost savings over improvement period</b>	789077
<b>Cost to implement EnMS</b>	54747
<b>Total Energy Savings over improvement period</b>	31260(GJ)
<b>Total CO<sub>2</sub>-e emission reduction over improvement period</b>	2840000KG

**Plan**

In order to carry out energy management smoothly and achieve the goal of energy conservation, Shanshui Group vigorously promotes the construction of energy management system. Shanshui Group has established an energy management and control center and established three-level energy network of

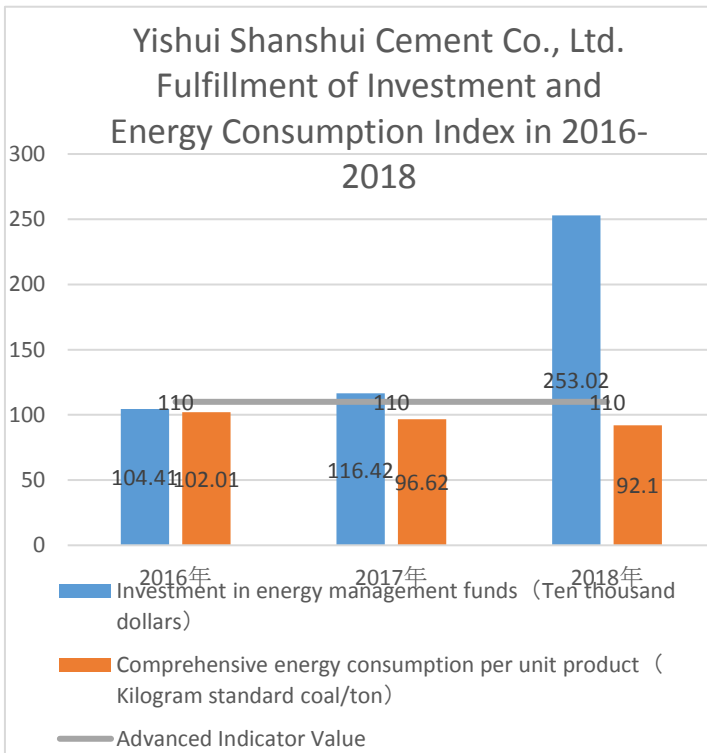
group headquarters, operation area and sub-companies.

In order to ensure the effective monitoring of energy indicators in the production process, a digital system is equipped to accurately monitor and feedback the coal consumption and electricity consumption of each section of the system. The energy consumption indicators fed back daily are counted and analyzed, and corresponding measures are taken in time according to the analysis results. The dispatcher reports the electricity consumption data to the statistician daily through the production digitization system, and then to the finance by the statistician. The cost analysis report is issued by the finance, in which the energy consumption analysis is analyzed by the dispatching control room. The use of raw coal is counted by production statisticians three times a month in the first, middle and last ten days, and the coal consumption is counted. In the aspect of water management, the waste heat power station is responsible for recording the total water consumption every month.

On the basis of guaranteeing the present achievements, through further improving the process system, we can find out the suitable points for stabilizing clinker strength for 3 days, increasing clinker strength for 28 days and steadily increasing clinker output to further reduce the energy consumption of the system; set up a special control group for leakage and leakage, and formulate a special quality guarantee system for leakage and

leakage control, aiming at the root causes of leakage and leakage of equipment and technology. In order to reduce surface heat dissipation and energy consumption, castables and insulation materials should be replaced in batches for five-stage feeding pipes, cyclones, smoke chambers, nozzles and three-stage air ducts by taking advantage of downtime maintenance opportunities.

In order to do a better job in energy management and lay a good foundation for energy management, the Group formulates corresponding management objectives for benchmarking each year in accordance with the provisions of the comprehensive budget system, and formulates an assessment system for the completion , of the indicators. At the same time, in order to actively accomplish the goals set by the group, besides strengthening management and supervision in daily production, the company also equipped with complete measuring and testing equipment and software, such as replacing the full-automatic weighing system by weighing, eliminating the impact of artificial weighing errors on energy basic management. Actively cooperate with the government's requirements and the work of the Energy System Audit Company to audit our



**Do, Check, Act**

In order to expand the effect of system resistance reduction, the company's main technical reforms in 2018 have carried out resistance reduction reforms from the cut-in angles of raw meal grinding circulating fan, third air duct and decomposition furnace, and the application of new sealing technology in various systems has achieved good results. After accumulating experience of technical reforms in recent years, the company has summed up the way suitable for our company's technical transformation and application, and the company's energy-saving plan in 2019. In the technological renovation projects, the main measures are to adopt new technology, new insulation materials and eliminate backward equipment and increase new energy-saving equipment. The energy consumption of production

system is constantly improved, and scientific management of energy resources is strengthened, and management and

1. On the basis of guaranteeing the present achievements, by further improving the process system, we can find out the suitable points for stabilizing clinker strength for 3 days, increasing clinker strength for 28 days and steadily increasing clinker output, so as to further reduce the energy consumption of the system.

2. Grasp the leakage of technology, equipment and other facilities, plan to tackle the root causes of the leakage of equipment and technology from the end of 2018 to March 2019, and formulate effective control methods and systems to reduce energy waste and expand energy efficiency.

3. Heat dissipation control on the surface of preheater; since December, 2018, castables have been replaced in batches for five-stage feeding pipes, cyclones, smoke chambers, shrinkage nozzles and three-stage air ducts, replacing the original thermal insulation materials with nano-insulation plates, reducing surface heat dissipation and energy consumption.

**Transparency**

Our company constantly compares and analyses various energy consumption indicators, and constantly upgrades the process system and equipment. In 2016, the main purpose of

technological transformation is to stabilize the ingredients and process of the system so as to achieve the goal of energy saving and consumption reduction. Through the achievements and experience gained in 2016, the technological transformation projects in 2017, such as resistance reduction of the process system, increase of the automatic control system and other technological transformation experience, are in 30 companies in the group. The application of raw material rotor scale in kiln and automatic coal feeding in kiln tail laid a foundation for energy saving and consumption reduction and clinker quality improvement. This project became a key promotion project of the group in 2017.

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and management and technological innovation are persisted.

### Lessons Learned

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First, the company has set up an energy management and control center, each member of the center has its own duties, to ensure the normal operation of the energy management system. The second is to conduct a comprehensive analysis of the energy (coal) used, and carry out a vehicle-by-vehicle inspection of raw coal and raw materials, and a vehicle-by-vehicle test. The energy consumption is reduced by adjusting the process and optimizing the energy consumption scheme in time. Thirdly, we should improve the recovery and utilization rate of secondary energy, and make full use of secondary energy in some processes and auxiliary systems. Fourth, a large number of energy-saving technological renovations have been carried out to reduce energy consumption and energy costs through technological renovations.

## Visual materials



Our Energy Management System Certificate is valid from Jan. 9, 2018 to Jan. 8, 2021.

12	宁夏中宁水泥有限公司	1833 kgce/t	入围企业
13	中国石油天然气股份有限公司 塔里木石化分公司	1868 kgce/t	入围企业

水泥行业

序号	单位名称	单位产品能耗 (可比熟料吨吨熟料)	备注
1	沂水山水水泥有限公司	96.53 kgce/t	领跑者
2	阿克苏天山水泥有限责任公司	97.55 kgce/t	领跑者
3	安徽皖能海螺水泥有限公司	100.29 kgce/t	领跑者
4	湖南蓝宇水泥有限公司	102.07 kgce/t	领跑者
5	福建河惠源水泥有限公司	102.58 kgce/t	领跑者
6	天津宁能绿水泥有限公司	102.60 kgce/t	入围企业
7	北流南博水泥有限责任公司	102.74 kgce/t	入围企业
8	华润水泥(上海)有限公司	103.03 kgce/t	入围企业
9	河北金隅隆鑫水泥有限公司	105.25 kgce/t	入围企业
10	桐庐上峰水泥股份有限公司	105.94 kgce/t	入围企业
11	德州中联大灰水泥有限公司	106.04 kgce/t	入围企业
12	萍乡红狮水泥有限公司	106.17 kgce/t	入围企业
13	岢岚山水水泥有限责任公司	106.19 kgce/t	入围企业
14	湖南金隅太行水泥有限责任公司	106.28 kgce/t	入围企业
15	徐州中联水泥有限公司	108.25 kgce/t	入围企业
16	平邑中联水泥有限公司	109.92 kgce/t	入围企业

Through the Energy Management Working Group (EMWG), government officials worldwide share best practices and leverage their collective knowledge and experience to create high-impact national programs that accelerate the use of energy management systems in industry and commercial buildings. The EMWG was launched in 2010 by the Clean Energy Ministerial (CEM) and International Partnership for Energy Efficiency Cooperation (IPEEC).

For more information, please visit [www.cleanenergyministerial.org/energymanagement](http://www.cleanenergyministerial.org/energymanagement).

