

DISCUSSION ON THE NECESSITY OF ENERGY CONSERVATION AND EMISSION REDUCTION FOR THE IMPROVEMENT ON THE ECONOMIC EFFICIENCY OF ENTERPRISES

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Abstract: The energy conservation and emission reduction of the Hunan Xiang Li salt mine was described in this paper, including paying close attention to the modification of energy-consuming equipment, increasing the improvement of energy-saving technology, improving the comprehensive utilization of resources, and making full use of the successful experience on performing energy-saving method and strengthening scientific management of energy.

Key words: energy-saving and emission reduction, Vacuum Manufacture Salt; economic efficiency

INTRODUCTION

Energy is the main material basis of human survival and social development. The energy problem has attracted worldwide attention and received great concern of the governments around the world. The total energy production of China have reached the top rank, but a energy consumption per capital is only 55% of the world average, one-third of developed countries. By contrast to this situation is that the very low efficiency of energy utilization, our unit GDP energy consumption is 10 times that of Japan, 4.5 times that of United States. The energy and raw materials consumption of China's industrial enterprises account for about 70 percent of the production costs, if lower the consumption by one percentage point, it can save more than 100 billion of production cost. Therefore, since the "Ninth Five-Year Plan", China's industrial enterprises had carried out the energy strategy and taken the energy-saving and emission reduction as the main measure to improve the economic efficiency of enterprises.

The main way for the enterprises to develop energy-saving and emission reduction is to improve equipment performance, achieve high output, low consumption and emission

including wastewater, waste gas, waste residue.

1 Pay close attention to the transformation of energy equipment, remarkable results had been made on the energy conservation

The total coal consumption accounted for over 95% of the total energy consumption and the consumption of the capital accounted for more than 40% of the total capital cost of the production. Therefore, first of all, pay close attention to energy-consuming equipment, in this regard the following measures had been taken:

1.1 Mine has the original Thermal Power Plant 4 35t / h chain boiler, run by long-term aging equipment, high coal consumption, low thermal efficiency, in order to tap the potential of old-fashioned energy-efficient boiler, 469,300 yuan of investment transforming the mine old boiler, air preheater by replaced by carbon steel borosilicate glass tube, replaced by the vertical horizontal, smoke heat loss decreased 3%, 3 times to extend the service life; the use of microcomputer control technology and the use of STD bus industrial control machine, testing of boilers, control and self-adjusting, so that the boiler running at its best; on

pulverized coal combustion boiler installation of spray devices, systematic overhaul of the boiler or in part, to improve the implementation of sub-metering furnace, furnace assessment points. After a series of transformation, the thermal efficiency of boilers from 60% to 75% reduction in annual emissions of 300 tons of sulfur dioxide, smoke and dust of the Ringelmann and Capital Control in about 1 °C, the annual coal savings 6850t, a cost-effective 100 million.

1.2 Boiler as the key to saving the "75" technical focus, active use of energy-efficient new equipment. Four million yuan investment in the construction of a 35t / h pulverized coal fired boiler. After put into operation, the Institute of Energy test, the thermal efficiency of the chain by the old furnace to 65.82% of 75.28%, an increase of 9.46%, ash from the average carbon content of 7.70 percent to 12.33 percent, significantly lower fuel fly ash, fumosorozeus chimney is up to standard requirements, to save coal in recent years 8000t, energy saving and the results are remarkable as excellent energy-saving technological transformation project in Hunan Province.

1.3 Obtaining 35t / h pulverized coal fired after the successful experience of saving energy and reducing consumption, 11 million yuan investment in the mine and built a 75t / h pulverized coal fired boiler and new construction of a chimney as high as 140m. Put into operation, the daily consumption of coal 80t less about the thermal efficiency of 88.5%, more than 13.22 percent of high furnace chain. Coal combustion stability and adaptability, dust removal rate of more than 95% throughout the year to reduce dust emissions from 194 million cubic meters (standard), to reduce carbon dioxide 1530t, Ringelmann smoke blackness fell 1 °C below the national industrial emissions emission standards, compared with the chain furnace annual savings of more than 20,000 tons of coal, generating more than four million kw, steam production year 33000t, comparable two 35t / h chain of furnace slag to reduce the more than 20,000 tons, the annual net increase of more than 340 integrated cost-effective million.

1.4 the use of new insulation materials for several thousand meters outdoor insulation

steam pipes. The original steam pipe insulation material the use of diatom silica brick, heat transfer coefficient of this material, and large heat loss. After 1987 to switch to the expanded perlite, insulation layer of the surface temperature decrease of 11 °C to 13 °C, the annual reduction of heat loss is equivalent to saving coal 400t, and then workshop part of the equipment on the salt compound silicate insulation, the effect is more good .

1.5 Energy-consuming equipment, pay close attention to the transformation of, and vigorously promote the use of coal-fired circulating fluidized bed boiler. Completion of the mine around 1 million tons of modern salt enterprises, the power consumption down to the advanced level in the same industry. In the "Tenth Five-Year" period of more than 900 million of investment has on the 3 35t / h boilers into the chain of circulating fluidized bed boiler. Circulating fluidized bed boiler 1 can increase the thermal efficiency of 7%, tons of standard coal steam consumption can be reduced about 20% of annual coal consumption volume of about 10000t savings, reduction of soot emission of pollutants. For deepening the energy-saving emission reduction, the mine in the introduction, assimilation, both at home and abroad based on mature technologies, and actively with Chinese characteristics, the use of circulating fluidized bed industrial boilers. "Eleventh Five-Year" period, more than 4000 million yuan investment, the new 1 75t / h circulating fluidized bed boiler and turbine-generator unit 1 7MW, circulating fluidized bed combustion boiler is fired between layers and between the combustion chamber a combustion technology with enhanced combustion, enhanced heat transfer, combustion efficiency, wide range of load changes and regulate the characteristics of a good, broad applicability of fuel, ash comprehensive utilization of broad characteristics such as type of boiler are energy saving and environmental protection. Dust for dry electrostatic precipitators, dust removal efficiency, flue gas purification to remove dust, not smoky chimneys. Furnace machine monitoring and control system DCS control system, a high degree of automation. New furnace project of mine completed and put into production, speed up energy-saving emission reduction, energy consumption

indicators of the gradual drop in overall energy consumption of coal tons of 166kg, a decrease of 4.3% year-on-year. Project of the new furnace in 2008 August 29-30, through the National Energy Saving Award project acceptance, confirm saving 12,700 tons of standard coal, 3.17 million yuan of national awards. Furnace due to the significant energy saving and environmental protection benefits, the mine will be installed to increase 1 75t / h circulating fluidized bed boiler is expected to go into production in 2010 to run in the second half. Circulating fluidized bed combustion technology, has become our country clean and efficient combustion of coal in the direction of development is widely used in electric power, chemical industry, salt, urban heating, industrial and other industries. Abroad of domestic waste-to-energy boilers and biomass power plants have been widely used.

2 Increase the energy-saving technological transformation, and improve the comprehensive utilization of resources

Mine the energy-saving emission reduction as a way of promoting economic growth an important measure for the change. Increased investment in energy-saving technological transformation, completely change the extensive mode of operation, taking resource conservation and comprehensive utilization of resources of the road.

2.1 pay close attention to waste, comprehensive utilization of waste ash has three self-invested 3,905,100 yuan cinder brick factory, from 1984 to 1993 the cumulative production of the decade 189670000 cinder blocks, processing 474,200 tons of slag, a record output of 1022 million. After the introduction of patented technology, fly ash brick production line built to reach an annual output of fly ash brick production capacity of 15 million, 15,000-year deal with fly-ash t, a value of 1.05 million yuan. Residues through the brick outside the sale and the comprehensive management of non-accumulation, the utilization rate of 100%.

2.2 build 3 million yuan investment in demonstration projects to promote the value of the item 75t / h, 35t / h pulverized coal drying project two production lines and put

into production one after another. To 75t / h dry coal ash powder production line for example, recovery of dry ash was 40,000 tons, a record 1.2 million yuan cost-effective, 99.55 percent collection efficiency, saving water, ash, slag handling charges 350,000 yuan. Exempt from excessive smoke emissions reduction costs 350,000 yuan, fly space-saving construction and operation of investment 50 million, to reduce the land more than 8 acres. The project identified by the provincial departments concerned with the promotion of the value of demonstration projects is an effective way of comprehensive utilization of fly ash.

2.3 Invested more than 360 million in the construction of closed-circuit treatment recycling projects of sewage purification. Which recycled 75000 ton coal ash each year and increased circulating water by 2.39 million ton. The index of wastewater emission achieved the national emission standards, exempt from sewage discharging charges 580,000 yuan, created economic benefits about 1.02 million yuan.

2.4 Invested more than 600 million yuan in the construction of cooling water recycle projects with the scale of 60 million cubic meters per hour to recycle the cooling water, which reduced the consumption of 1.296 million yuan of water resource each year, reduced emissions of 1987 tons of chemical oxygen demand, 1613t of suspended solids emissions, 2.592 million yuan of sewage.

2.5 Invested more than 100 million yuan in the expansion of heat power plant to increase the coal reserves and reduce wastage of raw coal, which created a good condition for the operation of boiler.

3 Relide on the scientific and technological progress,employed energy-saving "fournes"

This mine carried out the strategic policy of "giving top priority to energy conservation," the leading scientific and technological progress, the active adoption of new technologies and techniques of energy-saving, new products, new materials, enhancing heat transfer, reducing heat loss, recovery and utilization of surplus heat is the major way to save the energy.

3.1 There were 9 tube cooling devices in this mine, its heat transfer effects were very poor. Through bold exploration, the cooling system of Glauber's salt brine had been equipped with a plate heat exchanger of 230 m², which reached a cooling effect three times the effect of 3 tubular pre-cooling device, and the reduction in the cost of equipment financing, annual maintenance, power consumption were nearly 100 million, 15 thousand, 3.614 hundred thousand kwh respectively.

3.2 The original salt evaporation process is low in vacuum degree and large in heat loss, which also affected the yield. In order to save the energy and reduce consumption, a salt steam jet pump was produced. After it was put into use, the vacuum degree increased from the original 0.085MPa to 0.095MPa, and the temperature of the treated liquid dropped from 65 °C to 50 °C, the steam consumption per tons salt reduced by 50kg.

3.3 Performed technological transformation on salt and dust removal process. The adjustment of the process layout, the adoption of outside cyclone separation device, the installation of powder salt recovery device gave rise to recycle of 25,000 tons of sodium chloride and 4,000 tons of sodium sulfate dust to prevent wastage of resources, increase production.

3.4 The company replaced the water supply process by dividing the far-end and near-end water supply system, substituted the two for original three 185KW motor, decreased power consumption each day by 2000 kwh. Meanwhile, the company adopted the technologies of self-feeding halogen and energy-saving with frequency conversion, lowered the power consumption, obtained growing improvement on energy-saving efficiency.

3.5 The refrigeration system of sub-factory had experienced technological transformation. Three evaporative condensers produced by BAC Dalian Co., Ltd were used to replace the condenser tube, which achieved good results of energy-saving, low emission and environmental protection security.

4 Performed energy-saving emission reduction and strengthened the scientific

management of energy

Energy-saving emission reduction was carried out in accordance with the guiding ideology of "speeding up energy-saving technological transformation, promoting technological progress, strengthening the scientific management of energy-saving, increasing economic efficiency". Combining the transformation of enterprises operational mechanism, establishment of modern enterprise system and self-restraint resources consumption to lead the energy-saving emission reduction into the virtuous circle of development.

4.1 Improving the awareness of energy conservation. Energy is the important material foundation of a human life and social development, and everyone can not do without energy. Therefore, it is necessary to mobilize the strength of all workers. Since the the State Council decided to carry out "Energy Saving Publicity Week" activities every October from 1991, the mine promote "energy-saving awareness," "resource consciousness", "environmental awareness" vigorously, to arouse the whole energy-saving sense of the workers, change "need me to save" into "I want to save." At the same time, publicized and rewarded the good deeds of saving energy and reducing consumption, promoted and deepened the development of energy-saving and emission reduction.

4.2 Strengthening the management of the coal transportation. Due to too much coal supply point and transit links, reducing path loss is the focus of saving energy and reducing consumption. adopting merit-based procurement, strengthening measures, strict inspection, increasing direct access and reducing transit, strengthening the management of coal to achieve good results.

4.3 Promoting the management of fixed energy, developing 36 kinds of energy consumption ration and energy standards, As for the total energy consumption part, 17 energy-saving targets had been issued by the management department basing on the target management to the factory, company, department, workshops, groups and important machine team. Strictly honor the reward and punishment evaluation.

4.4 paying close attention to the production management and economic operation to achieve a minimum energy consumption and maximum economic benefits. Reasonably formulating the factory production process parameters, strictly enforcing the rules to win the high-yield and high-quality, timely adjusting operating mode, organizing production according to the market demand, do everything possible to reduce the gas, water and electricity consumption.

4.5 Perfecting energy statistics system to guide the production, the function department can timely perform analysis and statements in time of the energy consumption of main products and raw material consumption to provides a reliable basis for the production. Controlling the production process and working hours according to the analysis of report forms to balance normal production and continuous operation, increase the effective production time and increase yield per unit time, and promote the sustainable development of energy

conservation.

5 Conclusion

Since the mine had been built, especially the implementation of "Eleventh Five-Year Plan", great progress have been made in the production and technology. Reduction in the cost of production has made remarkable achievements, production and operations have changed dramatically. The annual production capacity of refined salt increased from tens of thousands of tons to the more than 70 million tons, annual production capacity of industrial anhydrous sodium sulfate increased from a few thousand tons of to more than 60,000 tons. The mine achieved good economy and lead a successful road of energy-saving emission reduction, sustainable development and exploring potential. promoted the resource-saving and environment-friendly enterprises construction, laid a good foundation for a new round of development and expansion of the mine.