Research on Comprehensive Evaluation of Energy Utilization of Enterprises

Chen ShiPing
School of Secretary, Law and Management, Beijing Polytechnic College, Beijing 100042, China

Abstract. Our country is short of energy. As the driving force of economic and social development, the effective use of energy is related to the sustainable development of the whole society and economy. Whether an enterprise can effectively use energy needs to be measured and a comprehensive evaluation system of energy utilization needs to be established. This paper introduces that in the comprehensive evaluation of energy utilization, enterprises can improve energy utilization efficiency by establishing energy efficiency evaluation system, improving balanced scorecard, evaluating energy factors and evaluating energy audit methods.

1. Introduction
As the world economy continues to develop and the population continues to grow, total energy consumption will continue to grow. However, due to the limited stock of mineral energy, if people cannot use mineral energy reasonably, there will be waste and loss of energy consumption, and the development technology of renewable energy is not mature, which will lead to more acute contradiction between supply and demand of energy. The limitation of energy storage and supply and people's unlimited energy consumption and demand are the energy shortage and crisis in the world today.

China has become the world's second largest energy producer and consumer, energy in the national economic and social development of China's strategic position is increasingly important. However, at the same time, China's energy shortage, energy efficiency is not high, energy related environmental pollution is becoming increasingly prominent, has become an important problem restricting the sustainable development of China's economy and society.

Improving energy efficiency is the primary way to maintain steady economic growth and control carbon emissions to protect the environment. Rational evaluation of energy utilization efficiency is an important basis for enterprise management decisions.

2. Establish an energy efficiency evaluation system to improve energy efficiency
Energy efficiency evaluation refers to the ratio of the energy that plays a role in energy utilization to the actual energy consumption. From the perspective of consumption, energy efficiency refers to the ratio of the service provided for end users to the total energy consumption. By "improving energy efficiency", I mean providing the same energy services with less energy input. Is also same specification a air conditioner, for example, to achieve the same cooling effect is decided by how much of the energy consumed energy efficiency of high and low, for an energy conversion device, such as boilers, steam calorific value of the product and its final output the calorific value of fuel consumption ratio is the energy efficiency, for the enterprise, is to provide the same product in the energy and can be simply understood as the reciprocal of energy consumption.
3. Improve balanced scorecard and establish enterprise performance evaluation index system

3.1. Overview of the balanced scorecard
BSC was first put forward in 1990s, and it is one of the important tools of modern enterprise strategic management and execution. This method decomposes corporate strategic objectives layer by layer from four dimensions of finance, customer, internal business process, learning and growth to form a performance appraisal index system. BSC is an important method of enterprise performance management, which can help enterprises establish a performance appraisal system oriented by strategic goals, improve management level and improve resource utilization rate.

With the continuous promotion of China's industrial structure upgrading, especially the strengthening of supervision on environmental protection, the single performance evaluation management can no longer meet the development needs of energy enterprises. At present, most domestic enterprises are still used with daily attendance, financial level as the main targets of the inspection way, although some companies through building the balanced scorecard performance evaluation index system, but there are still unclear strategic goals is not perfect, evaluation index, evaluation process, ignore the problem such as safety and environmental dimensions. Enterprises urgently need to improve BSC to build a performance evaluation system that can meet the long-term development of enterprises.

3.2. Improve BSC to construct enterprise performance evaluation system
Improve the balanced scorecard to build enterprise performance evaluation system, the financial, customer, internal business process, learning and growth is based on four dimensions, increase the safety and environmental dimensions, make up for the deficiency of traditional balanced scorecard in enterprise performance evaluation process, effective help energy enterprises to improve internal management level, improve the work efficiency, strengthen the consciousness of security and environmental protection.

The secondary indicators of financial dimension include: profitability, asset operation, solvency and growth capacity. Three-level profit indicators: profit margin of revenue, profit margin of cost and expense, return on equity; Three indexes of asset operation: asset turnover rate and non-performing asset ratio; Three indexes of solvency: current ratio, asset-liability ratio, quick ratio and cash flow liability ratio; Three indicators of growth capacity: operating growth rate, asset growth rate, profit growth rate and capital growth rate.

Secondary indicators of customer dimension include: customer loyalty, new customer attraction, market share, service status. Three indicators of customer loyalty: customer retention rate, new customer rate; Three-level indicators of new customers' new attraction: proportion of new customers' income in total revenue and percentage of total sales of similar products; Three-level indicators of market share: percentage of sales volume of similar products and growth rate of main business; Three indexes of service status: customer satisfaction and customer complaint rate.

Secondary indicators of internal business process dimension include: production quality, operation process, production efficiency, and after-sales service. Three levels of production quality indicators: qualified rate of energy quality inspection, qualified rate of production equipment quality inspection; Three indicators of operation process: inventory turnover, organization and management cost, and production line cost; Three evaluation indexes of production efficiency: daily energy output and total labor productivity; Three evaluation indexes of after-sales service: ratio of technical staff, delivery time and service cost per time.

The secondary indicators of learning and growth include: staff structure, staff productivity, staff satisfaction and progress, and staff loyalty. Three-level evaluation index of personnel structure: proportion of r&d personnel and proportion of high-level technical personnel; Three-level evaluation indexes of employee productivity: output per capita, patent number per capita; Three evaluation
indexes of employee satisfaction and progress: employee satisfaction score, employee compensation growth rate, employee promotion rate, and training duration per employee; Three evaluation indexes of employee loyalty: employee turnover rate, technical talent turnover rate, senior management talent turnover rate.

The second-level indicators of safety and environmental protection are divided into three aspects of production safety, environmental protection and environmental pollution, and the third-level indicators of production safety: standardization of production safety standards, occurrence rate of production accidents, handling efficiency of production accidents, number of casualties of production accidents, loss of production accidents, and administrative punishment of production safety accidents; Three indicators of environmental protection: standardization of environmental protection standards, comprehensive utilization rate of waste materials, greening and restoration rate of mining areas, and qualified rate of energy product environmental protection indicators; Three indexes of environmental pollution: the incidence rate of environmental pollution events, economic loss of environmental pollution, social impact of environmental pollution, and administrative punishment of environmental pollution.

4. The priority control energy factors are classified and evaluated

4.1. Priority control energy factor classification
Priority control energy factors are divided into the following three categories. Important category: high energy consumption, or energy consumption factors. Improvement category: high energy saving potential has been included into the focus of energy saving technology reform, or energy saving technology is mature and feasible to implement energy saving factors. Wide and easy to control: energy factors that do not belong to the above two items, but have obvious energy-saving effect due to simple control, wide coverage or high frequency of occurrence.

4.2. Principles for evaluating and ranking energy factors
1. The compliance
If an energy factor does not meet the requirements of laws, regulations, standards and other mandatory requirements, then such energy factor is an important and urgent energy factor.

2. On the premise of ensuring safe environment and original functions
The purpose of an energy management system is to optimize the allocation and use of energy, not to conserve energy. Energy conservation should be based on the premise of ensuring safety, achieving necessary functions, quality and avoiding environmental pollution.

3. Technical feasibility
For example: installation space size; Pipeline arrangement, etc.

4. Economic feasibility
Calculation of investment payback period; Government subsidies can be used to improve economic feasibility.

5. Energy saving
The energy saving generated by the control of energy factors is the main evaluation standard for energy units to fulfill their social responsibilities.

6. No low-cost programmes are preferred
No low-cost scheme with low implementation cost, if it has certain energy saving effect, it can be implemented in priority. No-cost solutions usually include: energy saving for economical operation of equipment; Optimized operation management scheme and small investment technical transformation.
5. Conduct energy audits to improve the market competitiveness of energy users

5.1. Common equipment for energy audit
Common equipment for energy audit include power quality analyzer, parametric ventilation tester, infrared thermometer, thermal imager, flue gas analyzer, illuminometer, noise meter, ultrasonic flowmeter, etc.

5.2. The audit content of energy audit
The audit contents of the energy audit are as follows: to consult the completion and acceptance data of buildings and the ledger data of energy-using systems and equipment, and to check the implementation of energy-saving design standards; Check energy consumption measurement records and financial bills of electricity, gas, coal, oil, municipal heat and other energy consumption, evaluate total energy consumption, per capita energy consumption and per unit building area energy consumption of classification and itemization; To inspect the operation of energy-using systems and equipment, and to examine the implementation of the energy conservation management system; To inspect the implementation of the recommendations on rational use of energy in the previous energy audit; To find out the links or locations where energy conservation potential exists and put forward Suggestions on rational use of energy; To examine the implementation of annual energy conservation plans and energy consumption quotas, and verify the explanations given by public institutions for using energy in excess of the quotas; To review the operation of energy metering equipment and check the authenticity and accuracy of energy consumption statistics.

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