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Practice and Prospect of Energy-saving Management Work in Colleges and Universities

-- Taking Zhejiang DongFang Polytechnic as an Example

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Abstract

With the rapid construction and development of colleges and universities, the campus area and the number of teachers and students continue to increase, and the energy consumption also shows an explosive growth trend. Taking Zhejiang Dongfang Vocational and Technical College as an example, this paper deeply explores the current situation of the energy-saving work of water, electricity and heating in colleges and universities, including serious waste caused by the lack of management, imperfect rules and regulations and difficult implementation, insufficient metering statistics and energy efficiency analysis work, insufficient development efforts of new energy-saving technologies, shortage of energy-saving management staff, and insufficient energy-saving publicity. Corresponding development strategies are put forward for these problems, such as strengthening the construction of energy-saving management systems, including quantifying data and improving energy-saving systems and management mechanisms; strengthening energy-saving publicity to create an atmosphere of energy conservation and emission reduction through school push and student club activities; strengthening the intensity of technological energy-saving, and actively applying energy-saving equipment and technologies; building a high-quality energy-saving management team. Finally, it is emphasized that energy-saving in colleges and universities is of great significance, and it is necessary to comprehensively improve the energy-saving awareness of teachers and students and start from every bit around.

Keywords

Energy-saving in Colleges and Universities; Management Work; Current Situation; Strategy.

1. Introduction

In recent years, the pace of college construction has been continuously accelerating, the campus area has been continuously expanding, and the number of teachers and students has increased rapidly. Under such a background, the energy consumption of colleges and universities has shown a very significant and sharp upward trend within the regional scope, and is still climbing. Colleges and universities are not only the key places for talent cultivation, but their own management should not only meet the requirements of sustainable development. More importantly, in the process of cultivating high-end talents, the concept of energy conservation and emission reduction should be conveyed to students. Colleges and universities must clarify their own responsibilities and actively carry out energy conservation and emission reduction work. After all, the issue of energy consumption and utilization is not only related to the present, but also has a profound impact on the future [1].

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From a realistic point of view, the energy management work of colleges and universities is directly related to the rational use of resources and environmental protection. Only by deeply sorting out and researching the energy management work of colleges and universities can we better explore the energy-saving path suitable for the development of colleges and universities themselves [2]. Through effective energy-saving management, energy waste can be reduced and energy utilization efficiency can be improved, laying a solid foundation for the sustainable development of colleges and universities [3]. At the same time, this is also an important measure to cultivate a new generation of talents with environmental protection awareness and sense of responsibility for the society, and has an important significance that cannot be ignored in promoting the energy conservation and emission reduction work of the whole society.

2. The Current Situation of the Energy-saving Work of Water, Electricity and Heating in Colleges and Universities

2.1. Severe Waste Due to Management Deficiency

College administrators usually focus their main energy on teaching work such as talent cultivation, social service, and cultural inheritance. Many administrators believe that students' energy use is mainly to meet daily life needs, rather than having a large number of high-energy-consuming facilities and equipment like in the industrial field. However, the actual situation is not so simple. Taking the college as an example, in public places such as classrooms, laboratories, conference rooms, and corridors, there are often situations where the lights are still on when there is no one, and equipment such as air conditioners and electric fans are often forgotten and not turned off casually. On the part of students, either they lack the awareness of energy conservation, or they think that the use of public places will be managed by the school and they don't need to participate in it. Various reasons lead to extremely serious energy waste on campus, and it is difficult to achieve effective management of turning off the lights when people leave. This kind of energy waste situation continues for a long time, which not only causes great waste of resources, but also brings great pressure to the sustainable development of the school [4].

2.2. Imperfect Rules and Regulations and Difficult Implementation

Although the superior departments or the functional departments of the college have formulated a series of relevant systems, there are many deficiencies in the specific implementation process, and the situation of insufficient implementation is very prominent. Many systems often only stay on paper, and lack sufficient consideration and planning at the actual operation level, resulting in that although there are many documents, they are difficult to effectively implement. Moreover, the wide range of energy management involved, the large number of participating roles, and the complex judgment conditions further increase the difficulty of actual operation. In addition, the insufficiency of supervision power, the insufficient penalty intensity, and the unreasonable penalty basis all make these rules and regulations difficult to really play their due roles. For example, the lack of effective supervision and timely punishment for some energy-wasting behaviors makes some violators emboldened, which undoubtedly poses a great obstacle to the promotion of energy-saving work.

2.3. Inadequate Metering Statistics and Energy Efficiency Analysis Work

The energy forms of the college are rich and diverse and the distribution areas are very extensive, which undoubtedly brings great difficulties to the statistics of management data. Inaccurate data as a decision-making basis will inevitably lead to a significant increase in management difficulty. In the aspect of student apartments, water, electricity, and hot water are measured separately, and the complex situation of multiple campuses and multiple systems also makes the difficulty of data statistics further increase, which has become one of the

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important problems faced in the process of carrying out energy-saving work. For example, if the energy consumption data statistics in different regions are not accurate, it is impossible to formulate energy-saving measures targeted, and it is impossible to effectively evaluate the effectiveness of energy-saving work, thus affecting the promotion and implementation of the entire energy-saving work.

2.4. The Development Intensity of New Energy-saving Technologies, New Products and New Processes is Not Enough

New energy-saving equipment often requires a relatively large one-time investment, and the transformation of old equipment faces relatively high difficulties, and there are relatively few energy-saving equipment solutions for colleges. Colleges usually face limitations in funds, technology and other aspects in the research and development and application of energy-saving technologies, and it is difficult to promote and apply advanced energy-saving technologies on a large scale. For example, the introduction of some high-efficiency energy-saving equipment requires a high cost, and the school may not be able to update and replace it in time due to financial constraints; or due to technical difficulties, some energy-saving technologies cannot be successfully implemented in colleges, all of which seriously restrict the in-depth development of energy-saving work.

2.5. Lack of Energy-saving Management Staff

Although the school logistics and property are equipped with relevant personnel, the professionalism and management level of the personnel are uneven. And there is a situation that the energy management position is set up virtually, and most of the management work of the management personnel is not concentrated on the energy management work. In addition, the quality of front-line management personnel is low, and it is difficult to effectively implement the energy management work to the front line. For example, some managers lack professional energy-saving knowledge and skills and cannot effectively carry out energy-saving management work; or due to the unreasonable setting of positions, the energy-saving management work cannot get enough attention and effective implementation, all of which have an adverse impact on the smooth development of energy-saving work.

2.6. Inadequate Energy-saving Publicity

Although the school has organized activities such as the water-saving publicity week or the energy-saving week according to the requirements of the government departments, and also guided teachers and students to actively participate in relevant energy-saving activities, and combined with the creation activities such as the green campus. But these activities are often only phased and difficult to really penetrate into the energy-saving consciousness of teachers and students. As an important base for cultivating talents, the school should integrate the energy-saving consciousness into daily study and work, give full play to the subjective initiative of teachers and students, and stimulate the internal motivation of energy-saving. For example, only through some short-term activities to publicize energy-saving, it is impossible for teachers and students to form long-term energy-saving habits and consciousness; or without the formation of an effective incentive mechanism, resulting in the low enthusiasm of teachers and students to participate in energy-saving, all of which require the school to further strengthen the energy-saving publicity work and improve the attention and enthusiasm of teachers and students for energy-saving.

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3. Strategy for the Development of Energy Conservation Work for Water, Electricity and Heating in Colleges and Universities

3.1. Strengthen the Construction of Energy Conservation Management System

In terms of quantification and data: Further strengthening the construction of energy conservation equipment and information technology is crucial. Uniform planning in new construction projects can not only ensure good docking between old equipment and new systems, but also achieve comprehensiveness and accuracy in data collection. For example, through intelligent sensors to monitor the energy consumption data of various equipment in real time and establish a powerful database. Such a platform can conduct in-depth analysis of energy consumption, detect abnormal situations and give early warnings in time, and at the same time, accurately push relevant information to managers so that timely measures can be taken.

In terms of energy conservation and system: After the college issues energy conservation policies, implementing an energy quota system can effectively restrain the energy use of each department. For example, allocate energy quotas reasonably according to the nature of work and scale of different departments. If the quota is exceeded, corresponding penalties will be given, while departments with good energy conservation performance can be given rewards. Signing an energy conservation target responsibility letter can strengthen the sense of responsibility of the department and closely link energy conservation with the vital interests of the department, such as reflecting energy conservation results in the evaluation and selection of excellent ones, and promoting each department to actively take energy conservation measures and rationally plan the energy use part in office funds.

In terms of management and mechanism: Formulate detailed energy use specifications, such as clarifying the lighting duration in different places and the use time of equipment. Through publicity and training, let teachers and students deeply understand and abide by these regulations. For professional energy management teams, regular training should be organized to improve their professional qualities, such as learning the latest energy management technologies and methods, and continuously optimizing the management process. At the same time, strengthen the cooperation and communication within the team to ensure the efficient and orderly progress of energy management work.

3.2. Strengthen Energy Conservation Publicity

When the school regularly pushes the publicity content of energy conservation and emission reduction, specific data and cases can be combined to allow students to understand the significance and effect of energy conservation more intuitively. For example, show the comparison of energy consumption before and after the implementation of energy conservation measures in the school, or introduce the successful energy conservation experience of other colleges and universities. In the publicity brochure, not only successful practices and cases can be recommended, but also some interesting energy conservation tips can be added, such as reasonably setting the standby time of electrical appliances. As the energy conservation publicity person, the dormitory administrator can regularly organize energy conservation exchange activities in the dormitory to share the energy conservation experience and tips of each dormitory and promote mutual learning and improvement.

After establishing a student association organization, carry out diversified energy conservation activities. For example, in a knowledge contest, questions of different difficulty levels can be set, covering all aspects of energy conservation; attractive prizes can be set in a prize quiz to stimulate the enthusiasm of students to participate. Through the student association to organize energy conservation publicity activities to enter classes and dormitories, widely

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spread the concept of energy conservation, and cultivate students' sense of energy conservation and responsibility, so that energy conservation becomes a part of students' daily lives.

3.3. Strengthen the Intensity of Science and Technology Energy Conservation

In order to further improve the energy conservation efficiency, actively applying new energy conservation equipment is the key. When promoting energy conservation appliances and equipment, their energy conservation principles and advantages can be detailedly introduced. For example, LED energy-saving light sources can greatly reduce energy consumption and have a longer lifespan compared to traditional light sources; the timing device of the water heater can avoid unnecessary energy waste. After conducting data statistics on the student energy consumption system and pushing it to the students, personalized energy conservation suggestions can also be provided. For example, for students with high energy consumption, remind them to pay attention to turning off unnecessary electrical appliances.

When using the energy management information system, it is crucial to focus resources on integrating the systems. For example, integrate the data of the power system, water supply system, etc. onto one platform to achieve comprehensive energy monitoring and management. Timely information sharing and pushing to students can allow them to understand the school's energy use situation and energy conservation progress in real time, enhancing their sense of participation and responsibility. In accordance with the construction concept of a green energy-saving campus, when accelerating the transformation and construction of smart street lamps, solar sidewalk lamps, rainwater collection and irrigation and other projects, the energy conservation effect and improvement of the campus environment of these projects can be detailedly explained to allow teachers and students to truly feel the benefits brought by scientific and technological energy conservation.

3.4. Build a High-quality Energy Conservation Management Team

When setting up a full-time position, the specific responsibilities and work contents of the full-time energy personnel should be clearly defined. For example, be responsible for the statistics and analysis of the school's energy data, and formulate energy conservation plans and measures. At the same time, cultivate a student assistant team and let them master basic energy conservation knowledge and management skills through training. Student assistants can assist full-time personnel to carry out daily work, such as conducting energy conservation inspections and collecting students' energy conservation suggestions.

To have a high-quality and responsible energy management team, it is also necessary to establish a perfect assessment mechanism and incentive system. Give recognition and rewards to outstanding managers and student assistants to stimulate their work enthusiasm. Through the joint efforts of teachers and students, give full play to their respective advantages and roles in the energy conservation management work, and promote the continuous and in-depth development of the energy conservation work in colleges and universities. At the same time, strengthen exchanges and cooperation with other colleges and universities, draw on advanced energy conservation management experience, and continuously improve their own management level and energy conservation effect.

4. Conclusion

The energy conservation work in colleges and universities is indeed an extremely challenging but also meaningful task. Its significance lies not only in being able to actually save a large amount of energy and contribute to the sustainable development of energy in society, but also has a non-negligible promoting effect on the wide spread of energy conservation awareness. By reducing the unit energy consumption, it can greatly save office funds and make resources be used more rationally. Colleges and universities must attach great importance to the promotion

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of energy conservation work and comprehensively enhance the energy conservation awareness of teachers and students, guiding them to start practicing the energy conservation concept from the little things in life and from every move around them. Through strengthening the construction of the energy conservation management system to make the energy conservation work follow rules; by increasing the intensity of energy conservation publicity to create a strong energy conservation atmosphere; by strengthening the intensity of scientific and technological energy conservation to improve the energy conservation effect with technical means; plus building a high-quality energy conservation management team to provide a solid guarantee for the energy conservation work. Only in this way can we continuously promote the energy conservation work in colleges and universities to a new level, and then realize the long-term sustainable development of colleges and universities, play an active and important role in building a resource-conserving and environment-friendly society, and truly make energy conservation a powerful support and a beautiful business card for the development of colleges and universities.

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