

Exploration of Energy and Resource Conservation Strategies in Vocational Colleges from the Perspective of Energy Conservation and Education

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Abstract: This article will analyze the energy consumption statistics and current situation of a vocational college in Shanghai in the past three years. Through the exploration and corresponding implementation effects of the school's combination of energy conservation and education in recent years, taking energy conservation and education as the starting point and perspective, some innovative measures and thinking directions in the energy-saving management process of vocational colleges will be explored. This can also provide a certain reference and inspiration for the energy-saving development direction of the college during the 14th Five Year Plan period, as well as the energy consumption analysis and energy-saving emission reduction work of other universities in Shanghai in the future.

Keywords: Ecological civilization; Energy conservation; Resource conservation; Energy-saving strategies; Direction of energy-saving education

1. Basic Status of Energy Conservation in Vocational Colleges

Vocational colleges are currently facing a widespread problem of insufficient funding. With the continuous expansion of enrollment in vocational colleges and the increase in student numbers, the single campus education model of most schools can no longer meet the existing teaching needs. Taking Shanghai as an example, it is understood that vocational colleges in Shanghai have generally been carrying out new campus construction in the past 5-10 years. Shanghai XX College also launched a dual campus education model at the end of 2018, which undoubtedly increased a lot of energy consumption in the process.

2. Analysis of Energy Consumption Statistics of XX College in Shanghai in the Past Three Years

2.1 Introduction to Basic Situation of Energy and Resource Consumption

The main types of energy consumed by Shanghai XX College include electricity consumption, water consumption, natural gas consumption, and gasoline consumption.

2.2 Statistics and Analysis of Energy and Resource Indicators

Due to the incomplete analysis of energy consumption for the whole year of 2023 at the time of writing, based on the consumption of energy resources such as electricity, water, and gas at Shanghai XX University from 2020 to 2022, the electricity, water, and natural gas consumption for the whole year of 2022 will be calculated; And per capita water consumption, per capita electricity consumption, per capita natural gas consumption, per unit building area electricity consumption, and energy consumption. And calculate the year-on-year changes of various indicators in 2022 compared to 2021 and 2020, and make an analysis as shown in the following table.

Content	2020	2021	2022	a ratio of 22 to 2	a fixed ratio of 22 to 20
Total electricity consumption (10000 kWh)	676.18	1026.39	842.91	-17.88%	24.66%
Total natural gas volume(10000 cubic meters)	10.8	19.8	18.7	-5.56%	73.15%

Total water consumption (10000 cubic meters)	20.34	27.35	28.47	4.10%	39.97%
Per capita water consumption (cubic meters/person)	25.75	32.55952381	28.74886398	-11.70%	11.66%
Per capita electricity consumption (kWh/person)	855.92	1221.892857	851.1663132	-30.34%	-0.56%

According to the data analysis shown in the table, compared with 2021, the per capita energy consumption indicators of XX College in 2022 have all decreased to varying degrees.

The decrease in energy consumption indicators directly reflects the importance attached by teachers and students of the school to campus energy conservation in the past three years. This is closely related to XX College's continuous promotion and education of energy conservation, lectures on energy conservation education, increased courses on ecological civilization, and the establishment of work study assistance positions, as well as the recruitment of a large number of students to participate in the school's energy conservation management work in the past two years. The following is a brief sharing of XX College's beneficial explorations in energy conservation and education work from 2022 to 2023.

3. Beneficial exploration of energy-saving education in Shanghai XX College in the past two years

3.1 Actively cooperate in carrying out energy-saving and emission reduction publicity work, and the energy-saving publicity efforts are still acceptable

The college actively responds to the requirements and instructions of the Civil Aviation Administration of China and the Shanghai Municipal Education Commission for energy conservation and emission reduction publicity and promotion work. From 2022 to 2023, the college carried out a series of themed energy conservation publicity work such as "energy conservation and carbon reduction, green development" and "low-carbon life, green building for the future", focusing on green life creation actions such as conservation oriented campus, green school, green travel, green building, and household waste classification. A series of activities were carried out in the Xuhui and Pudong campuses of the college, including posting promotional posters, organizing property management to conduct inspections of electrical facilities and equipment, and training on waste classification.

3.2 Recruiting students through educational platforms to participate in garbage classification work, with good results in garbage classification

From 2022 to 2023, the college has implemented a full process classification system with the goal of reducing and resourceful domestic waste, establishing a system for the classification and disposal, collection, transportation, and cleaning of domestic waste.

In the past two years, XX College and third-party service companies such as property management have organized a series of garbage classification publicity activities to enhance the environmental awareness of teachers and students in garbage classification. The college has recruited nearly 30 volunteer students through the school's work study platform to participate in practical work for the college's garbage classification positions. Through a series of activities such as promoting and demonstrating the classification and disposal of household waste carried out by student volunteers, the college has encouraged teachers and students to start from themselves and enhance their awareness of garbage classification and environmental protection.

3.3 Recruiting students through the work study platform to participate in campus building energy-saving management

In the past two years, XX College has continuously carried out work study service positions centered on energy conservation and consumption reduction among all students in the school, with the theme of "Work Study and Logistics Education", on a semester by semester basis.

In the work of work study programs, all students are dedicated and responsible, promptly turning off the ever burning lights and running water, turning off the air conditioning in unmanned rooms, and promptly reporting for repairs to the energy facilities and equipment such as lights and faucets that cannot be turned off. Students take the initiative to take care of the school as their own home, saving energy and reducing waste from the source.

4. Reflection and Suggestions on Energy saving Management Direction in Higher Vocational Education from the Perspective of Energy saving Education

4.1 Building a student participation smart energy platform application through a student financial aid

platform

As an administrative department that students come into contact with extensively in their daily lives, the school's logistics department's infrastructure and activities will have a tangible impact on all aspects of students, playing a crucial supporting role in their development through subtle influence. This can not only actively guide students to participate in the intelligent logistics service management of the school, allowing them to experience the difficulties of logistics work, but also learn more social practice skills, providing more inspiration and opportunities for innovation and entrepreneurship in the future.

By guiding school students to personally participate in the application of the campus smart energy platform, such as gradually dismantling old mechanical water meters, electricity meters and other equipment in the school, and installing smart water and electricity meters, school students can participate in familiarizing themselves with and using the energy monitoring platform of the school building. When building the smart energy supervision platform, students who participate in building energy-saving education can be given certain viewing and usage permissions, so that students have subjective awareness of the school's energy consumption and supervision. Students participating in this work are reminded to analyze energy consumption reports from time to time, which can reduce the cost of school research and energy statistics. Based on the energy consumption analysis that students participate in together, targeted energy-saving renovation work can also be carried out.

4.2 Combine the relevant issues and difficulties of energy conservation in schools with school teaching

The energy-saving management department of vocational colleges needs to adapt to local conditions and combine with the teaching characteristics of vocational colleges. It can appropriately consider the problems and difficulties encountered in the school's energy-saving work, such as management or technical issues, and invite teachers and students with relevant courses or research directions to discuss them through internal scientific research projects. Encourage students to innovate and invent around energy-saving related fields, call on teachers and students to carry out special projects around energy-saving related issues, and explore the feasibility of applying practical new inventions developed to energy-saving management or construction in schools. Utilize the joint wisdom of teachers and students to add strength to the school's energy-saving and consumption reduction efforts. At the same time, it is also conducive to cultivating students' innovative ability and thinking, which can be described as a win-win situation.

4.3 Introducing energy-saving concepts and knowledge into school classrooms and clubs

In order to fully utilize the educational role of university logistics services, it is necessary to change the indifference and lack of attention of teachers and students towards energy conservation and consumption reduction in the school. As the main target of logistics services provided by universities, students should have a certain understanding of the energy consumption and usage situation of the school.

However, the current situation is that it is very common for college students to waste energy resources such as water and electricity. For this reason, school management departments should actively encourage college students to spontaneously organize student clubs or activities focused on energy conservation. At the same time, schools can also organize third-party service companies such as property management personnel to regularly promote energy-saving concepts to school students. If conditions permit, staff from Shanghai water and electricity departments can also be invited from time to time to provide basic energy-saving knowledge training for teachers and students, enhancing their awareness of energy conservation and environmental protection.

5. Summary

As vocational college students who focus on cultivating professional skills and literacy in the new era, they should set an example in energy-saving ideas and behaviors. Schools also need to guide students to develop the habit of saving energy, eliminate resource waste, and strengthen energy-saving management. At the same time, schools should deepen the determination of energy-saving responsibilities, establish a reasonable energy-saving management reward and punishment mechanism, and strictly implement it. Relevant professional students should participate in the management of various energy-saving technologies in the school as much as possible. Based on the construction of smart campuses, students should fully play their role in the practical operation of related new energy-saving facilities (such as smart water, computer backend statistical analysis of electricity meters, etc.), actively guide students to cooperate in carrying out campus energy and environmental monitoring, and contribute their youthful strength to the sustainable development of social energy resources.

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