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CURRENT SITUATION AND DEVELOPMENT TREND OF URBAN CENTRALIZED HEATING

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СОСТОЯНИЕ И ТЕНДЕНЦИИ РАЗВИТИЯ ЦЕНТРАЛИЗОВАННОГО ОТОПЛЕНИЯ В ГОРОДАХ

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Abstract. In the context of sustainable development, countries around the world are increasingly paying attention to environmental issues. In this context, the high energy consumption and high pollution of urban heating systems have become urgent issues that need to be addressed. Promoting urban centralized heating is an inevitable choice to effectively solve these problems. The heating system is an important component of urban development, and central heating plays a crucial role in energy utilization. In order to meet the requirements of sustainable development, it is necessary to actively improve the central heating system and solve the problems of low resource utilization and high energy consumption in traditional decentralized heating methods. This can reduce air pollution and improve the overall quality of the urban environment. A comprehensive analysis of the relevant content of urban central heating systems, including understanding the existing problems and development trends, helps to formulate reasonable measures to promote the development of central heating. Promoting the development of central heating systems is an important component of urban sustainable development. By improving energy utilization efficiency, reducing dependence on traditional fossil fuels and using advanced technologies, central heating systems help to achieve the Sustainable Development Goals and improve the quality of life of urban residents. A comprehensive analysis of the current situation and development trends of urban central heating can help formulate reasonable measures to promote the development of central heating, achieve a more sustainable future, and create a sustainable urban environment.

Аннотация. В контексте устойчивого развития страны мира уделяют все больше внимания экологическим вопросам. В этом контексте высокие энергозатраты и загрязнение в городских системах отопления стали неотложной проблемой. Содействие централизованному отоплению городов является необходимым вариантом для эффективного решения этих проблем. Система отопления является важным компонентом развития городов, и центральное отопление играет жизненно важную роль в использовании энергии. Для удовлетворения требований устойчивого развития необходимо активно совершенствовать системы централизованного отопления и решать проблемы низкого использования ресурсов и высокого энергопотребления в традиционных методах децентрализованного отопления. Это может снизить загрязнение воздуха и улучшить общее качество городской среды. Всесторонний анализ содержания городских централизованных систем отопления, включая понимание существующих проблем и тенденций, может помочь в разработке разумных мер по содействию развитию централизованного отопления. Содействие развитию систем централизованного теплоснабжения является важным компонентом устойчивого развития городов. Благодаря повышению энергоэффективности, снижению зависимости от

традиционных видов ископаемого топлива и использованию передовых технологий системы центрального отопления способствуют достижению целей устойчивого развития и повышению качества жизни городских жителей. Всесторонний анализ состояния и тенденций в области централизованного отопления в городах поможет разработать рациональные меры по содействию развитию централизованного отопления, достижению более устойчивого будущего и созданию устойчивой городской среды.

Keywords: sustainable development, urban centralized heating, urban heating system.

Ключевые слова: устойчивое развитие, городское централизованное отопление, городская система отопления.

Introduction

Central heating can use efficient heat sources and heat transfer systems to reduce energy waste, reduce smoke and carbon dioxide emissions, and improve environmental quality. Centralized heating can achieve large-scale operation, reduce heating costs, improve energy utilization efficiency, and reduce users' heating expenses. Centralized heating can monitor and maintain the heat source and heat transmission system in a centralized manner, ensuring the safety and reliability of the Hydronics. Urban centralized heating is a feasible, energy-saving, environmentally friendly, cost-effective, convenient, fast, and safe and reliable heating method that can meet the heating needs of urban residents, reduce urban energy consumption, and promote sustainable urban development.

1. The significance of the development of centralized heating.

The urban centralized Hydronics ensures the high quality of life of residents and energy conservation. The application of urban centralized Hydronics plays an important role in improving working conditions and heating production. Urban centralized heating is a heating method that typically generates heat energy in thermal power plants or heat source facilities in the central area of a city, and then is transported through pipelines to surrounding buildings for heating. This method can avoid the smoke and exhaust pollution caused by each building's self burning fuel for heating, while also improving the efficiency and stability of heating. Urban centralized heating is one of the important public service facilities in the process of urbanization, which can provide a comfortable living environment for urban residents and is also an important direction for the transformation of urban energy structure.

1.1 Reduce fuel usage and save energy.

Nowadays, cities mostly adopt the form of centralized heating. In winter, when the temperature is extremely low, a centralized mass control method is used to adjust the temperature and flow rate of the heating medium, ensuring that the heating parameters are within a reasonable range and normal heating. This model has obvious advantages, not only reducing resource waste, but also reducing costs and achieving optimized resource allocation.

At present, China's coal resources invested in industrial boilers reach over 200 million tons annually, while the amount of coal used in urban heating is about 50 million tons. Generally speaking, the thermal efficiency of small boilers used for heating and small and medium-sized boilers used in industrial applications is not high. If the central Hydronics is used in cities, the central heating system uses boilers with large capacity, and the thermal efficiency generated is much higher than that generated by decentralized small boilers. In this way, the annual use of coal in industrial boilers and urban heating can be greatly reduced, If conditions permit, thermal power

plants can also be used for heating. Thermal power plants can carry out joint production of heat and electricity, which can effectively improve the efficiency of fuel use. This will further reduce the amount of fuel used, thereby further reducing the amount of investment in production and bringing good economic benefits to both the country and enterprises.

1.2. Reducing Air Pollution.

Urban centralized heating can reduce the use of traditional energy sources such as coal, reduce environmental pollution and the occurrence of haze weather, and improve urban environmental quality.

In traditional mode, using coal for heating can cause environmental pollution and decrease air quality after combustion. In order to demonstrate the advantages of urban centralized heating network, it is necessary to avoid building scattered small boiler rooms as much as possible, which helps to centrally utilize heat energy and greatly helps environmental protection. The boiler capacity used in the centralized heating network system is relatively large, which can maximize fuel savings. In modern society, the continuous introduction of advanced technology can improve resource utilization. Effectively reducing the discharge of solid pollutants without causing significant impact on the natural environment. Environmental protection has become a theme of the new era, and the country vigorously advocates energy conservation and emission reduction. Therefore, urban heating should comply with development requirements, and by optimizing the design of heating projects, the expected goals can be achieved. In the heating process, it is necessary to attach importance to environmental protection, minimize pollution, improve resource utilization, and comply with the concept of sustainable development.

The environmental pollution problem caused by the rapid economic development is also becoming more and more serious. Sulfur dioxide gas and soot dust generated in the heating process constitute one of the main reasons for urban air pollution. Usually, the Hydronics is located in the center of dense urban population, which is more harmful to the human body. Scattered small boilers have a more prominent impact on this problem. Whenever cities in the north enter winter, the more obvious the problem of environmental pollution caused by heat supply is, at this time, the sulfur dioxide in the atmosphere is generally many times higher than that in ordinary times, which is mainly caused by the direct burning of coal in decentralized small boilers for heating. Many countries and regions have begun to explore the establishment of urban centralized Hydronics to solve the environmental pollution problems they face, because urban centralized Hydronics usually use large and centralized equipment, The use of automatic mechanical operation can improve the efficiency of fuel use and reduce the amount of fuel input. In addition, the centralized Hydronics is generally equipped with a good dedusting and filtering system, which reduces the emissions of pollutants in the air and improves the urban air quality to a certain extent.

1.3. Improving the Quality of Life of the People.

The small and decentralized Hydronics not only occupies the place, but also leads to the tension of residents' power consumption, which is not conducive to environmental protection. This makes residents' bodies and lives vulnerable in the long term. The use of the urban centralized Hydronics can fully meet the residents' demand for heat supply, and will not occupy residents' land and electricity. It is clean, sanitary, and very convenient, which is very beneficial to the national economy and the people's livelihood. Urban centralized heating can improve the rationality and sustainability of urban energy structure, promote urban economic development, and enhance urban competitiveness and attractiveness.

2. Composition of central Hydronics:

The Hydronics is an important part of supporting the normal operation of the city, which

specifically includes: heat source, heat medium transmission equipment, heat users and monitoring and control equipment as well as auxiliary equipment. Heat source equipment includes: thermal power station, boiler room, heat pump, etc; Heat medium transportation equipment: mainly including heat transmission pipelines, hot water pumps, valves, accessories, etc; Heat exchange equipment for heat users: mainly including heat exchangers, radiators, heating fins, etc; Monitoring and control equipment: mainly including temperature, pressure, flow, water level and other sensors, automatic control systems, regulating valves, etc; Auxiliary equipment: mainly including water pumps, air compressors, cooling towers, water treatment equipment, etc. The above equipment constitutes a complete urban centralized Hydronics. These devices require corresponding maintenance and management to ensure the normal operation of the system and provide stable heating services for users.

Heating equipment mainly refers to thermal power plants or boiler rooms, which generate heat by burning energy or resources, including fuel, water, electricity, and heat; The heat source consists of boilers, mechanical equipment for transporting fuel and removing ash, water pumps, blowers, and other parts of the water treatment and distribution system; The pipe network of the Hydronics consists of pipes, supporting equipment and accessories. The specific laying methods of the pipe network include overhead, pipe trench and direct burial [1]. During the operation of the heating pipeline network, energy loss is mainly manifested in the heat transfer process and leakage. The heat exchange station serves as a secondary network heat source, and the energy consumption equipment includes heat exchangers, circulating water pumps, and makeup water pumps. Hot users transmit heat to various rooms through heating equipment to maintain indoor temperature. The amount of heat consumption by users mainly depends on the quality and performance of the radiator, as well as the insulation performance and enclosure structure of the building.

The main method of urban centralized heating is usually heating through a heating network. This method is achieved by constructing a heating network system in the city, which transports the heat generated by heat sources (such as boiler rooms, thermal power plants, etc.) through pipelines to the user's heat exchanger, and then transfers the heat to the user's heating, hot water, and other heat load equipment through the heat exchanger, thereby achieving the purpose of heating.

The heating pipeline network system usually consists of main pipelines, branch pipelines, and user heat exchangers. The main pipeline is the backbone of the heating network, responsible for transporting the heat generated by the heat source to the branch pipelines in various regions. The branch pipeline transports heat energy to the heat exchangers of each user, which are responsible for transferring heat energy to the user's heat load equipment. The entire system achieves the purpose of heat energy transmission and heating through the circulation of the heating pipeline network.

The heating network heating method has the advantages of high energy utilization rate, good heating effect, and convenient operation and maintenance, so it is widely used in the field of urban heating. In addition, there are also some emerging heating methods, such as ground source heat pumps and solar water heaters, but their application scope and technological maturity still need to be improved compared to the heating pipeline network.

3. Current situation of urban centralized heating:

Urban centralized heating has been widely applied globally, especially in cold regions, high-density cities, and industrial parks. The following are some current situations of urban centralized heating:

3.1. Defects in the previous heating system.

At present, there is a common problem in urban heating. The Hydronics is scattered and disordered. Some buildings have a boiler room, some have several boiler rooms in a yard, or some

cities simply do not have a boiler room. In newly built residential areas, even heating equipment is not installed, so residents have to use small stoves or other means of heating in their buildings.

Now, with the acceleration of urbanization, the number of residential communities in cities will greatly increase in the future. If we continue to use decentralized heating methods, the use of coal will inevitably increase in the future, which will further exacerbate environmental pollution. Under the influence of traditional heating systems, there are many defects in the design and operation of heating. Most of the Hydronics are designed carelessly, many of them do not meet the actual requirements, but the workers are working with experience and feeling. In this case, if they are directly connected to the heating network supply system, there will be many inevitable problems, such as imbalance of water power and water temperature of residents. From the perspective of the original heating system, it is generally intermittent heating, which makes it difficult to calculate the heat load accurately. When heating according to the heat dissipation area, it will cause the room temperature to be slightly higher. When heating according to the actual heat load of the building, it may also result in a low room temperature, which is manifested as a serious imbalance of the temperature of the heat collection pipe, either upper cooling and lower heating, or temperature imbalance [2].

3.2. Old thermal equipment and defects in monitoring of Hydronics.

Currently, most of China's thermal equipment is relatively old, and the quantity of heating equipment is not only limited, but many quality issues also exist, leading to frequent occurrences of water leakage and corrosion in heating pipelines. In the current Hydronics, there is basically no corresponding monitoring and leak detection facilities, and there is no relevant treatment measures. When there is a water leakage accident in the heat supply pipeline, first of all, it is difficult to immediately find out where the leaking pipeline is located, and second, there is no way to reach the accident pipeline at the first time to take measures. Secondly, among many heating users, there is a situation where they illegally use the hot water in the heating pipeline, resulting in serious loss of hot water in the heating pipeline. This not only affects the actual hydraulic situation of the heating pipeline, but also causes serious rust and corrosion of the heating pipeline and equipment. Oxides caused by corrosion fall into the pipeline, which can block the pipeline and radiator, thus making the quality of heating not guaranteed. Serious obstacles to the development of heating industry.

3.3. Thermal efficiency is not proportional to cost consumption.

Based on the operation and management of urban centralized heating, the issue of heat energy efficiency and cost consumption being not proportional is very prominent, leading to generally low heating quality and varying degrees of resource loss, which deviates from the development goals of environmentally friendly cities. This type of problem is more common in the operation and management of centralized heating, manifested in lagging equipment and technology, insufficient management innovation, and inevitable resource loss in heat energy conversion. In terms of urban heating and heating, there is often a situation where one cannot make ends meet, which greatly affects the high-quality growth of the urban economy.

3.4. Defects in the charging system leading to waste of heat energy.

Currently, in China, heating fees are calculated based on area, while residents pay based on the number of usable areas of their homes. In this situation, residents are indifferent to the energy consumption of heating. They feel that when the room temperature is high, they open windows to dissipate heat, and some people steal hot water from the heating pipes. At the same time, when residents go out, they cannot adjust the indoor Hydronics, and can only keep the Hydronics open all the time, resulting in a lot of unnecessary waste of heat energy. Secondly, in terms of the use of energy, many Hydronics are still relatively decentralized and miniaturized. This way is relatively

inefficient in the use of energy. In the process of heating, the energy consumption is very large. In addition, in the process of heating, energy conservation is not emphasized and fuel is wasted at will.

3.5. Lack of policy support and theoretical research foundation.

In the field of industrial research on heating, many theories are still based on the past, lacking basic data for designing work procedures, resulting in unsolved theoretical innovation and many technical problems in engineering. However, there are not many relevant policies and regulations in the field of heating introduced by the country, and various construction and design units generally reflect the phenomenon of a lack of scientific research personnel in the heating field. In the absence of theoretical background and professional level as a foundation, as well as the lack of national policies to support, the heating industry is facing many challenges.

4. Development trend of urban centralized supply.

4.1. Pay attention to optimizing the original Hydronics.

Due to the late start of urban heating in China, the development of heating equipment is usually based on foreign equipment, with few independently developed equipment. Therefore, one of the main construction tasks in the future is to study heating equipment. Strive to develop heating equipment with higher heating efficiency and better energy-saving performance. The energy-saving operation mode of the boiler plays an important role in the urban centralized Hydronics, so it is necessary to focus on the optimization of the internal structure of the boiler and make continuous improvement to ensure that the boiler has higher operating efficiency and better energy-saving effect, so as to ensure the smooth use of the urban centralized Hydronics [3]. Faced with the increasingly high requirements for energy conservation and environmental protection, relevant staff should divide and optimize the internal structure of the boiler itself. They should have a clear understanding of each structural size parameter and function of the boiler, and test and examine the rationality and scientificity of the main parts of the structure to achieve maximum optimization, To avoid the inability of urban centralized heating to proceed smoothly due to the boiler's own problems.

Pay attention to optimizing the combustion status of the boiler room and increase awareness of fuel conservation. At present, many Hydronics in our country were built in the early days of liberation, and many of the equipment has aged, so the energy consumption is high when heating. Therefore, it is necessary to improve the combustion mode of the boiler, improve the internal structure of the boiler, so as to improve the combustion efficiency of fuel, and develop new measures to strengthen the sealing of the boiler combustion process and ventilation pipes, so as to reduce the emission of dust particles into the atmosphere, Reduce the level of air pollution.

In addition, while solving the problems of the boiler itself, the selection of fuel in the boiler is also very important. From the perspective of environmental protection and energy conservation, try to choose fuel with higher efficiency to avoid burning inferior coal and causing irreversible environmental pollution [4-6]. In addition to coal, biomass energy, natural gas, or gas, biogas, etc. can also be used as fuels for centralized heating.

Finally, in the process of boiler management, Heat meter and other instruments should also be installed, so that the boiler can be kept in an ideal and efficient state, and the potential problems existing in the boiler can be found in time, so that timely treatment can be carried out to reduce energy consumption [7].

Secondly, it should be recognized that the core of the Hydronics is the transmission and distribution of heat supply, because it is related to the output and utilization rate of heat sources. This is because many heating companies only pay attention to improving the efficiency of boiler combustion in the case of centralized heating, but do not pay due attention to the loss in the process

of heat energy transmission, which also causes a great waste of heat energy. The design of the heating network is related to the heating effect, Energy conservation is of great significance. Therefore, attention should be paid to the transformation and innovation of the transmission and distribution system, actively absorbing advanced technological means, and focusing on the institutional issues of the range and distance of the transmission configuration. To minimize energy consumption to the greatest extent possible.

Optimizing the layout of heating network In the process of optimizing the control of the urban Hydronics, in order to achieve better heating effect and no waste of resources, relevant staff must work hard on the construction of heating network management. Discuss and conduct detailed analysis on the construction of the heating pipeline network, and then select a more practical and feasible plan for implementation, in order to ensure that the heating pipeline network has a stronger and more efficient operating effect. At the same time, attention should be paid to the overall layout of the heating pipeline network and try to avoid excessively long transmission pipelines. Reasonable design of pipeline network layout and pipeline routing: Pipeline and pipeline settings are the core content of the entire pipeline system, and whether the pipeline layout and pipeline routing are reasonable directly affects the heating effect. When designing the pipeline network system, it is necessary to carefully inspect and scientifically design, conduct drawing analysis, fully understand the design intent, reasonably layout the pipeline direction, and consider reasonable optimization and arrangement from the perspective of the entire heating system to ensure the rationality of the entire centralized heating pipeline network, so that users from far and near can enjoy standard heating services.

Strengthen the thermal insulation performance of the overall Hydronics During the operation of the urban central Hydronics, in order to achieve more energy saving of the overall Hydronics, heat loss must be taken into account, and it is necessary to ensure that the overall operation of the urban central Hydronics has a more powerful thermal insulation function, which requires relevant staff to optimize the thermal insulation structure of the Hydronics. In the urban centralized Hydronics, most of the insulation layer structures are mainly used in the heating pipe network. Therefore, it is necessary to ensure that the relevant heating pipes have scientific and reasonable insulation layers. During the construction of the heating pipes, more reasonable insulation materials should be selected to make the overall insulation effect of the heating pipe network better and improve the overall insulation performance [8].

In addition, relevant staff should also understand the heating needs of each area and grasp the operation process of the entire centralized Hydronics, so as to improve the operation efficiency of urban centralized heating pipe network and avoid waste of resources.

4.2. Development and Application of New Technologies.

Today, with the rapid development of automation, people have entered the information age, and advanced technology has been applied in various fields, including urban centralized heating. From the current situation, the centralized heating pipeline network system has achieved automatic control and can be adjusted according to outdoor temperature.

The intelligent management of urban central heating will be widely used. Through advanced monitoring and control technology, Big data analysis and artificial intelligence, the optimal scheduling of heat sources, heat pipe networks and user heat loads will be realized, and the heating service level and energy utilization efficiency will be improved.

Set up a measuring meter in the pipeline system and use a computer for adjustment, to have a comprehensive understanding of the actual operation situation. Reducing the laying area in pipeline network design, conducting on-site inspections of urban conditions, and designing reasonable plans

are beneficial for reducing construction costs. Reasonable layout can meet heating needs in a short period of time, greatly improving operational efficiency and reducing adverse factors. While meeting user needs, reasonable allocation of limited resources will not lead to waste, and continuous improvement of heating quality will have good economic benefits.

With the continuous transformation of heating networks and the introduction of various advanced technologies, heating enterprises should seize this opportunity, actively utilize advanced technologies, improve equipment, and improve the reliability of heating. Energy conservation and emission reduction are the top priority for large heating enterprises, and funding is also a complex issue when implementing projects. Therefore, enterprises need to make good use of public investment opportunities to implement projects and prepare for the reform of Hydronics. Enterprises should strengthen and improve heat supply management in practice, summarize deficiencies, learn basic knowledge, and prepare for the reform of Hydronics.

The concept of intelligence is gradually advancing. The future is the era of intelligence, and all industries will permeate the concept of intelligence. In urban heating, intelligent temperature control, intelligent billing and other intelligent methods will gradually be promoted. By installing intelligent control equipment on the user end, customers can choose to control the indoor temperature by themselves, which can be adjusted as needed through remote control. And it can conduct more scientific and reasonable intelligent billing based on customers' heat usage and usage period. For example, when users are not working at home during the day, a lower temperature can be set. Automatically adjust the indoor temperature half an hour before the user returns home, ensuring a suitable temperature when the user returns home. This can significantly reduce the consumption of heat sources, in line with the national energy-saving and emission reduction strategy.

Finally, when we pay attention to the monitoring of the Hydronics, as an integrated and holistic system, if one of the links is damaged, it will affect the benefits of the overall Hydronics. Therefore, in the process of heating, we should use advanced technical means to strengthen the monitoring and management of temperature, heat and other parameters, and timely find and solve problems in the system.

At present, Cogeneration is the best production mode for large thermal power plants, and Cogeneration is the only one that has been tested by a large number of production practices. The principle of Cogeneration is to generate a continuous flow of mechanical energy by burning steam, which is used as the power for power generation. At the same time, water is used to cool the steam and convert a large amount of heat energy into water. As we all know, water has the largest Specific heat capacity, which is undoubtedly the best conduction medium for heat energy. From the analysis of the operation principle of Cogeneration, it is not difficult to see that it can be said that one boiler can be used for two purposes, that is, it can produce electricity, meet the heating demand, and maximize the use of energy.

Adhere to the planning of heat source pattern dominated by Cogeneration, and Cogeneration has high efficiency. Under the current energy consumption structure of coal based heating, promoting the strategic decision of energy conservation and emission reduction in small and medium-sized cities must break the restrictions and open up the situation, open up new ways to achieve Cogeneration, and improve the urban heat source pattern.

Urban centralized heating will gradually achieve system diversification, including ground source heat pumps, solar water heaters, natural gas, etc., to adapt to the needs and energy structure of different regions and users. For heating enterprises, the use of Big data technology for data mining and the application of intelligent decision support systems will also become the main trend

in the future. Fully considering new technologies and products during design, the management and control of heating enterprises tend to be intelligent. So that the Hydronics can not only meet the needs of energy conservation and emission reduction, but also operate in the best state.

4.3. Optimize the management of Hydronics.

In view of the problems in the operation and management of urban central heating, the concept of energy conservation and consumption reduction should be actively infiltrated into practice, and reasonable measures should be selected based on the actual situation to implement comprehensively, so as to solve the problems of high energy consumption and heavy pollution in traditional heating methods, and effectively improve the energy conservation effect of the central Hydronics. From the perspective of long-term urban development, only by efficiently producing and using energy can cities maximize their energy utilization efficiency. Following the concept of sustainable development to promote high-quality urban development has a positive effect on improving the quality of life of urban residents. For such issues, it is necessary to strengthen awareness and attention to centralized heating, strengthen energy conservation and consumption reduction management in the process of centralized heating, closely connect and control various links, in order to reduce unnecessary energy loss, meet environmental requirements, and assist in sustainable urban development. The specific measures are as follows.

The prerequisite for strengthening management and updating high-end concepts to implement energy-saving and consumption reduction management is to strengthen management, minimize costs, and improve the company's economic benefits. A scientific management approach is conducive to promoting the overall development of the company. If we continue to use traditional heating management methods, we still have a long way to go to meet the needs of modern enterprises to improve social efficiency.

Establish a leadership responsibility system. When implementing advanced management of thermal energy consumption, a management responsibility system should be divided according to responsibilities. Based on the actual situation, a scientific and reasonable analysis should be conducted on the specific situation of energy consumption, a reasonable management system should be developed, quantitative energy consumption indicators should be established, and responsibilities should be implemented.

Motivate employees. Without the support and participation of all employees, management cannot be successfully developed and improved. Only by fully mobilizing the enthusiasm of employees can we do our work better. For the problems concerned by employees, managers should start from the grass-roots level, explain the importance of work to employees in detail, list perfect evaluation standards and implementation methods, refine rewards and punishments, and mobilize employees' enthusiasm. In addition, managers should listen to employees' opinions more, obtain better suggestions through meetings and discussions, and finally unify their thinking, fulfill their duties, and fully participate in detail management.

Scientific development enhances the soft power of personnel and technology, and technological progress and innovation stimulate the industry's thirst for high-level personnel. Personnel and technology promote each other, which is a dual wheel driving the heating industry in parallel.

By promoting the scientific development of personnel and technology to upgrade the soft power of urban centralized heating, a new path can be opened for the rapid development of current heating, and a good solution can be created to explore and solve the current problems of small and medium-sized cities. Realizing the overall technical transformation and optimization of the Hydronics is an important development direction for personnel and technology upgrading, and a

scientific means to solve the current problems of small and medium-sized cities. At present, more and more heating enterprises have clearly realized that only by relying on personnel with advanced technology to comprehensively optimize the Hydronics and take the road of scientific development can they fundamentally reverse the situation and solve their own problems. Enhance personnel and technological competitiveness, and promote the marketization, specialization, and standardization of heating in small and medium-sized cities.

Conclusions

In summary, the accelerated urbanization process is actively promoting the development of the heating industry, while also facing the problem of gradually increasing consumption of resources and energy.

From the perspective of long-term development of the city, only by efficiently producing and using energy can the city maximize its energy utilization rate, and promote high-quality development of the city by following the concept of sustainable development. The central Hydronics of the city is the main content of urban planning and construction, which plays a positive role in improving the quality of life of urban residents. In this regard, it is necessary to strengthen awareness and attention to centralized heating, strengthen energy conservation and consumption reduction management in the process of centralized heating, closely connect and control various links, in order to reduce unnecessary energy loss, meet environmental requirements, and assist in sustainable urban development.

There are various types of centralized Hydronics in cities. In order to reduce energy consumption and promote the construction of environment-friendly and resource-saving cities, reasonable energy conservation measures should be selected according to the actual situation and implemented to achieve strict control over the whole process of heat energy production and transmission. While improving energy utilization, unnecessary energy consumption and environmental pollution can also be reduced to achieve the development goal of energy conservation and consumption reduction in cities, Thus promoting high-quality and green development of the heating industry.

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