

# Research on the Change Trend of Urban Heating Market and the Upgrading of People's Livelihood Consumption — Taking Jimo District of Qingdao City as an Example

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**Abstract.** With the increasing living standards of the people, the heating market has undergone tremendous changes. This paper starts with the changes in the heating market and conducts in-depth research. It is found that urban central heating is shifting from "luxury" to "inclusive". In the past 30 years, the city's central heating has grown from 100,000 square meters to nearly 18 million square meters. On the one hand, the people's demand for central heating is becoming more and more urgent, and the requirements for centralized heating quality are getting higher and higher. On the other hand, traditional coal-based heating is limited by environmental protection policies, and the capacity is seriously insufficient. The heat is still in the application pilot phase. Therefore, this article mainly discusses the above issues in depth.

**Keywords:** Heating Market; Consumption Upgrading; New Energy.

## 1. History and Basic Situation of Central Heating in Jimo

Jimo District is the jurisdiction area of Qingdao City, Shandong Province, with a history of more than 1400 years [1-3]. Located in the southwest of Shandong Peninsula, China, east of the Yellow Sea, across the sea from Japan and Korea, south of Laoshan, near Qingdao. The terrain in the territory is generally low mountains and hills, which belongs to the warm temperate monsoon continental climate zone. The annual average temperature is 12.1 celsius, and the extreme cold temperature in winter is 18.6 celsius. At present, there are seven towns and eight streets with a total population of about 1.22 million, of which more than 400,000 people live in urban areas.

The centralized heating of Jimo has a history of nearly 30 years. From the initial use of industrial waste heat by various enterprises to heat their own areas, Jimo has developed into a specialized centralized heating service based on Jimo Thermal Power. At present, the popularization rate of central heating in the whole district has reached 85.5%, and the supporting area has reached 17.7 million square meters, which increased by more than 170 times in 30 years. Especially after nearly ten years of rapid growth, central heating has completely changed from "luxury livelihood" to "inclusive livelihood," which directly reflects the people's constant pursuit of a better life [4].

## 2. The People's Livelihood Status of Central Heating from the Perspective of Housing Price

Only from the perspective of real estate sales strategy, during the period of 2006-2011, all kinds of second-hand housing sales promotional process highlighted the "double supply" (heating), and people regard this as an important selling point and promotional point of price changes [5]. Since 2012, "double supply" has become the basic indicator of urban real estate. For example, in Heping District along the Third Yellow River Road, Jiujiu Garden and Hexiang District south of Xinxing Road, the house price is about 6000-7000 yuan per square meter without participating in the central heating system. After the completion of the central heating system, the house price rises directly to 10,000-11,000 yuan per square meter.

For instance, in the process of the construction of two residential districts in 2016, individual unit users in the residential districts did not participate in the central heating. In the same residential area, there is a clear price gap between matched and non-matched of central heating. At the same time, according to the introduction of its residential property and real estate intermediaries, the real estate of these people actually has no market value.

From these specific examples, especially in 2012, the urban area completed the household control transformation on a large scale, and implemented the thermal reform of some old residential areas. Heating has changed from a luxury item for people's livelihood in the past to a basic guarantee for people's livelihood. Residents' demand for heating has changed from insisting on making their own stoves during the cold wave to having a heating system for their houses. Then from the supply, the development of standard heating, and further put forward higher requirements for heating temperature, and even appeared in different periods, different groups of people with different temperature needs of "personalized heating" [6-8]. In the past, the supply of heat has changed into the present supply of good heat. This directly reflects people's constant pursuit of a better life with the development of society.

### **3. Traditional Energy Sources are No Longer Able to Meet the Growing Heating Needs of the People**

At present, there are seven major heat source enterprises in the urban area, including Jimo Thermal Power Plant, Qingdao Jinyuan Thermal Power Plant and Huachuang Hengyuan [9-10]. Besides Jimo Thermal Power Plant and Qingdao Jinyuan Thermal Power Plant who use coal fired boiler, others mostly use biomass or natural gas as their main energy sources. Among them, Jimo Thermal Power Plant and Jinyuan Thermal Power Plant occupy more than 90% of the urban heating area. Since 2015, Jimo District has already stopped commercial central heating access. At present, the traditional heating capacity of the whole urban area is less than 12 million square meters. From the perspective of urban areas alone, the gap has reached for more than 5 million square meters, and the new demand cannot be reached. In extreme cold weather, some regions must use emergency oil-fired boilers for temporary protection. In addition, Jimo District is carrying out urbanization transformation and Blue Valley New Area, which has more than 100 million square meters of central heating demand. From the development history of heat supply in Jimo District, the contradiction between the growth of urban heating demand and energy shortage has always existed. Although traditional energy heating enterprises have taken a series of measures to expand their heating capacity, such as Jimo Thermal Power Plant who carried out low-temperature circulating water heating in 2007, gradually replacing the steam heating mode with high consumption. Moreover, water mixing technology transformation was implemented in 2011. These measures to improve the security of central heating without increasing heat sources, but they are far away from the growing demand of people for central heating.

### **4. The Significance of Application Research of Renewable New Energy to Guarantee People's Livelihood**

Since 2017, the state and province have issued plans for "clean heating in winter in northern areas"[11-12]. The key is to set an annual average coal consumption ceiling based on the total coal consumption in 2017 or 2018. At the same time, the heating demand of the whole northern region has maintained a steady growth of about 10% annually. Regardless of whether it is based on the satisfaction of increment or the guarantee of stock, renewable new energy will become the main force of central heating.

(a) As a supplement to traditional energy, new energy can expand the heat supply capacity of traditional energy. Through the organic combination of traditional energy and new energy, the traditional energy is used to ensure the average load, while the peak load in extreme cold weather is supplemented by new energy, which will further release the supply capacity of existing traditional energy.

(b) New energy has become a new power of central heating because of its distribution and flexibility. For example, since 2014, Jimo Thermal Power Plant has implemented trial projects of renewable energy sources such as air source, sewage source, medium and deep geothermal energy. Although the heating area is only 400,000 square meters, a large amount of data has been collected from heating effect, regulation and control mode, operation status and so on. Form the view of the

current situation, although the cost of new energy development and application is generally high—the cost of hydropower is even more than 40 yuan per square meter—with the breakthrough of some technical difficulties, it can be replicated and popularized.

## 5. Conclusion

In conclusion, from the point of view of the development of central heating in Jimo District, the Chinese people need to consume the corresponding energy to live better, but the Chinese people have the wisdom and ability to provide new non-polluting renewable energy security on the basis of not increasing the existing fossil energy. Definitely, this also requires young people to learn well, master more science and technology, better serve social development, and achieve people's yearning for a better life as soon as possible.

## References

- [1]. Shao Xiaoyan. Regional Economic Development under the Background of New and Old Kinetic Energy Conversion: Taking Jimo District of Qingdao City as an Example [J]. Journal of Qingdao Administrative College, Qingdao Municipal Party School, Communist Party of China, 2018, No. 248 (2): 30-34.
- [2]. Research on the evolution and Optimization Countermeasures of Jimo city spatial form [D]. Shandong Normal University, 2015.
- [3]. He Sheng, Liang Zhilei. Jimo, an ancient name - the past and present life of Jimo District [J]. Go to the world, 2017 (45): 24-27.
- [4]. Song Renguang, Qiu Xuguang, Yan Zhihai. Jimo City fully implements the central heating and gas supply project [J]. Shandong Environment, 2001 (4): 33-33.
- [5]. Jiang Lin, Zhao Jianhui, Cui Tian, et al. [J]. Discussions on household-based metering in heating District [J]. Refrigeration and air conditioning: Sichuan, 2005 (z1): 271-273.
- [6]. Wang Junying, Dai Xiaoguang, Lai Jingyan. Current situation and Countermeasures of urban heating system reform in Qingdao [J]. Journal of Qingdao University of Technology, 2003, 24 (2): 42-45.
- [7]. Yu Liqun, Li Xin, Dai Xiaodong. Study on the influencing factors of the structural adjustment of heating energy in Qingdao [J]. Journal of Qingdao University of Technology, 2002, 23 (2): 41-44.
- [8]. Dai Xiaoguang. The influence of price and supply-demand relationship on the structural adjustment of heating energy in Qingdao [J]. Resources and Development, 2002 (1): 33-36.
- [9]. Wang Kun. Huadian Qingdao Thermal Power Co., Ltd. [J]. Oriental Enterprise Culture, 2017 (s1): 81.
- [10]. Zhang Jian, Zou Quanbo. Discussion on the heating mode after Qingdao introduced natural gas [J]. Journal of Qingdao University of Technology, 2005, 26 (4): 35-39.
- [11]. Anonymous. On Clean Energy Heating (Cooling) - A "Weapon" Towards a Zero-haze Era [J]. Housing and Real Estate, 2018, 513 (28): 69 + 85.
- [12]. Wang Fengyin, Monday Fan, Wang Cuiping, et al. Performance Analysis of Qingdao Heat Pump Assisted Solar Heating System [J]. Gas and Heat, 2010, 30 (10): 17-20.