**METHODS FOR THE DEVELOPMENT OF INTEGRATED HEAT AND COOLING SYSTEMS IN THE HARSH CONTINENTAL CLIMATE**

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А complicated energy infrastructure complex based on intelligent management is being created by active globalization, the development of modern technologies in electric, heat, cold, gas supply systems etc. Such technologies can significantly improve the energy efficiency of energy systems and the comfort of working and living conditions for the inhabitants. These trends in the energy sector indicate the natural integration of various energy systems at the level of production, transmission and consumption [1].

The cold supply system has a predominantly local character and low capacities, in contrast to the electric, heat, gas, and water supply systems in the Russian energy sector. However, in developed countries, the cold service has already become an integral part of an integrated energy supply system.

The main share in the district cooling market in Europe is heat pumps, free cooling, compression and absorption chillers. The harsh continental climate is characterized by hot summers and severe winters. Hot summers create the preconditions for the emergence of demand for cold supply, and harsh winters reduce the efficiency of using heat pumps and free cooling. Renewable energy sources, such as geothermal, wind and solar, require large investments and have a number of restrictions for use. Analysis of operating experience and research by Swedish scientists show a higher efficiency of using absorption chillers compared to compression equipment in the presence of heat recovery from a combined heat and power (CHP) plants or waste incineration. Another important incentive for the transition from compression to absorption district cooling is the reduction of carbon dioxide emissions in accordance with the Paris Agreement [2,3]. For these and other objective reasons, absorption equipment is a fairly universal solution for the implementation of a district cooling for regions with harsh continental climate.

An increase in the standard of living, the gradual development of the country's energy sector leads to an increase in the requirements for the comfort of a person’s working and living environments. On the other hand, indoor climate standards in a harsh continental climate require air conditioning in the summer. In addition, the development of heat and cold supply systems can have a multiplier effect for the electricity, heat and cold market participants.

This work is devoted to the development of methods for implementing integrated heat and cold supply systems using the example of the Yakutsk city. Various technical solutions are analyzed at the level of consumers, distribution networks and stations. Assessment of the balance of production and consumption of electric, thermal energy and cold conducted. A technical and economic evaluation of various options for district cooling was made.

**References**

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