

MODERNIZATION AND DEVELOPMENT OF THE ARCHITECTURE OF RESIDENTIAL COMPLEXES IN NORTH KAZAKHSTAN

Rakhimzhanova D. B.

Today, ecology is defined as one of the country's development priorities. The success of any environmental project in the first place determined by the environmental awareness as part of the general culture of the population.

The important of the fundamental principles of prosperity of the state is uninterrupted and reliable power savings. The economy of the Republic of Kazakhstan (RK) is in seventh place on the carbon pollution, releasing about 1,200 tons of CO₂ equivalent per million dollars of product produced, while the world average is around 500 tons of CO₂ equivalent per million dollars of product produced. Energy sector is the source of 80 % of all emissions, of which 90 % comes from the manufacturing sector of heat and electricity. Buildings first housing sector, consume electricity 13.5% and 24% heat energy. The residential sector is the third in the country after the energy sector and the manufacturing sector.

Active consumption of fossil fuels (such as oil, gas, coal) a very negative impact on the ecological balance of the earth. This is the reason of climate change and increased greenhouse gas concentrations in the atmosphere.

Energy conservation measures may be different. One of the most effective ways to increase energy efficiency - the use of modern energy-saving technologies.

Energy-saving technologies can solve several problems at once: save a substantial part of energy resources, to solve the problems of the domestic housing sector, increase production efficiency and reduce the burden on the environment.

Energy efficiency apartment complex consists of two main parameters: the energy-efficient architecture with the use of special materials and special equipment for alternative energy methods.

Main activities and engineering solutions that provide the specified conditions in the premises of the building:

- rchitectural and planning solutions building (town planning, space-planning, building envelope, translucent enclosures);
- Engineering systems (heating, ventilation, air conditioning, utilization, management, automation and control);

The approach to the study of energy performance of buildings and finding the right solutions to optimize their energy efficiency determines the resolution of complex interrelated tasks that make up the three main areas:

- Organization of the indoor climate;
- Minimize energy costs;
- Cost of the building, rational expenditure of material resources.

To achieve optimum results in these areas is possible under the conditions determining:

- Appointment of settlement of internal conditions, including indoor air quality of the building. Optimal and acceptable conditions, lower and upper limits of the ranges of changes, availability of design parameters in the warm and cold seasons;

- Selection of the design parameters outside air with different security probability of weather elements;

- Choice of options architectural and planning solutions, including:

- Urban planning and space-planning solutions, building density, breaks, landscaping, hydration, orientation to the light and wind patterns, the shape of the building, blocking, body width, glazing and protection of facades, roofs, underground part, attic, floors of the building, floor height, functional layout, patios, staircases and lift lobbies;

- Modern, the most promising design solutions exterior walls, ceilings, windows, doors. Evaluation of temperature and humidity and filtration mode designs with enhanced thermal protection. Selection and design of structures filled skylights for thermal, optical and aerodynamic properties. Optimization of glazed facades of buildings;

- The temperature-humidity conditions and the mode of ventilation in the building. Adopted heat, air-, moisture barrier characteristics of the elements of the building envelope. The specific characteristics of walling and energy performance of building systems. Methods for calculating the heat and air modes of building space;

- Engineering systems provide temperature and humidity of the building. Traditional and alternative energy sources. The joint work of the building envelope and systems engineering;

- Energy-efficient heating of the building. Sectional facade, every apartment, vertical, horizontal, one-and two-pipe, radiator, convection, radiant panel, air, electric, self-regulating and measuring the flow of heat for heating buildings;

- Options to energy and economic systems of ventilation. Exhaust, gravity ventilation system with increased wind resistance, with control valves for air intake and with the influx of organized regulated through valves in the design window. Mechanical exhaust system with exhaust air heat recovery. Mechanical supply and exhaust system with heat recovery;

- Hot Water Systems with economical use of water and heat with a split of household sewage system relatively clean water from baths and sinks. Options making use of the compression heat pumps for decentralized domestic hot water. As a low-grade heat source for the heat pump evaporator using a combination of heat groundwater wells, relatively clean water sanitation and heat exhaust air ventilation system;

- Individual heating units heating systems. The decentralized autonomous sources. The use of renewable energy of the sun, soil, processes and heat exhaust air and relatively clean wastewater. Choosing the most efficient use of combinations of elements of the exterior of the building supply and home consuming systems;

- Systems of regulation and control of temperature and humidity conditions of the building. Supply routes and peak daily consumption of energy recovery systems and accumulation. Automation control, management, accounting of energy consumption;

- Electricity (use of electric motors with variable frequency, economical lighting and appliances, switching to a system of two - three tariff bill);
- Efficiency and optimization solutions that provide climate-energy. Performance indicators, security, reliability, manageability microclimate of buildings. Technical and economic feasibility of optimization options and solutions.

Head of Research: lecturer, professor, Surankulov Sh. Zh.