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A.B. Tasybayev

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**A policy ensuring that renovation/new buildings comply with energy
efficiency standards**

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This policy defines the measures to ensure that new or renovated buildings comply with energy efficiency standards. To address this issue, the University follows the legislative and regulatory documents of the Republic of Kazakhstan on energy conservation and efficiency improvement:

1. Law "On Energy Conservation and Energy Efficiency Improvement" dated January 13, 2012, No. 541-IV;

2. Requirements for the energy efficiency of buildings, structures, and their elements, which are part of the enclosing structures, approved by Order of the Minister for Investments and Development of the Republic of Kazakhstan No. 406 dated March 31, 2015;

3. State standards in the field of architecture, urban planning, and construction of the Republic of Kazakhstan SN RK 2.04-07-2022 "Thermal Protection of Buildings";

4. The Concept for the Development of Energy Conservation and Energy Efficiency in the Republic of Kazakhstan for 2023–2029, approved by the Government of the Republic of Kazakhstan on March 28, 2023, No. 264.

Energy efficiency improvement is a hidden reserve for dynamic economic growth through the redistribution of freed-up financial resources. Effective management of energy resources consumption requires an energy management system.

The energy policy is the driving force in implementing and improving the organization's energy management system (EMS) and energy efficiency within its scope and boundaries.

The University's energy policy aims to develop the scientific potential of young specialists and create conditions for the implementation of scientific projects of practical importance in the field of energy conservation and efficiency improvement.

Applicable terms include: "building energy standards," "thermal building regulations," "energy conservation requirements in buildings," "building energy efficiency requirements." The terms "building codes" or "energy standards" for new buildings often overlap with energy efficiency requirements for constructed buildings, regardless of whether they are a set of construction regulations, specific standards, or other documents.

Given that any university engages in scientific, educational, and instructional activities, the main objectives of its energy policy are:

1. To support the implementation of state energy conservation and energy efficiency policies through the University's scientific and educational activities. To foster a culture of energy conservation among students, university staff, and the public.

2. To ensure efficient and rational consumption of energy resources in the University's real estate, taking into account the need to improve the quality of educational services.

Energy efficiency building standards imply several levels of responsibility in terms of implementation and quality control:

1) National level – Government of the Republic of Kazakhstan, Ministries of the Republic of Kazakhstan, authorized bodies of the Ministries of the Republic of Kazakhstan, and quasi-governmental sectors under these Ministries.

2) Local level – Almaty City Akimat (Energy and Water Supply Department of Almaty City).

Energy efficiency building standards represent a set of mandatory requirements developed to reduce building energy consumption. These standards are used as mandatory tools to encourage achieving the required energy efficiency characteristics of buildings. Various countries use different approaches to formulating energy efficiency building standards. A prescriptive approach sets minimum requirements for the energy performance of individual building components – windows, walls, as well as heating and cooling equipment. A performance-based approach requires an integrated design based on a comprehensive assessment of the building's energy performance.

- Energy efficiency policy focuses on:
- Core regulatory documents;
- The strictness and scope of energy consumption building codes;
- Performance requirements in energy consumption building codes;
- Prescriptions (requirements) in energy consumption building codes;
- Energy certification;
- Compliance and enforcement requirements;
- Requirements for building materials and equipment.

The requirements for architectural, planning, technological, structural, engineering solutions affecting the energy efficiency of buildings, structures, and their components, and included in design documentation and applied during construction (reconstruction, major repairs), to eliminate unreasonable energy resource consumption, include:

1) The regulated (baseline) specific heat energy consumption in the building should not exceed the value specified in Appendix 1 to these requirements;

2) The baseline value of the required (regulated) thermal resistance of the building envelope should not be less than the value specified in Appendix 2 to these requirements;

3) The regulated value of the building's specific thermal protection characteristic should not exceed the value specified in Appendix 3 to these requirements.

6. Cost-effective solutions for building enclosures should take into account the specific climatic conditions of the construction site.

7. The design documentation for new construction or expansion (major repairs, reconstruction) of existing buildings must comply with energy efficiency class "A," "B," or "C."

7-1. Information about the energy efficiency class is placed voluntarily in a publicly accessible area (on the information board in the building entrance and/or in the lobby of the building at a height of no less than 1.5 meters and no more than 2 meters, and/or on the building facade next to the main entrance, at a height of no less than 1.5 meters and no more than 2 meters), according to the form of energy efficiency labeling of buildings, approved by Order No. 1106 of the Acting Minister for Investments and Development of the Republic of Kazakhstan dated November 26, 2015 (registered in the State Register of Regulatory Legal Acts under No. 12541) at the initiative of the client (developer), the building owner, or the homeowners' association of a multi-apartment building.

The use of different energy consumption levels in determining the building's energy performance, of which 90% is attributed to heating, hot water supply (76%), and lighting (67%). Prescriptions for technical characteristics in energy consumption building codes include requirements for thermal insulation, including U-values (94%), along with boiler and air conditioning systems (88%), ventilation or air quality (82%). Lighting density, natural light, and solar radiation (G-values) are equally represented (65%) alongside renewable energy sources and thermal bridges, which make up 53%. Energy certification is an important tool for improving the energy performance of academic buildings and student dormitories. The main purpose of energy certification is to inform building owners, tenants, and residents, and to visualize energy efficiency as an additional marketing tool. Thus, it can be a powerful marketing instrument for creating demand for energy-efficient construction.

Technical requirements in energy efficiency building standards. Energy efficiency improvement plan to reduce overall energy consumption.

1) Conducting ongoing and major repairs, reconstructing existing buildings on the campus using advanced construction materials and technological equipment to prevent unreasonable energy consumption, regulating the building's energy consumption characteristics, and optimizing its overall energy efficiency and conservation performance.

2) In designing and constructing new buildings on the University campus, adhere to the legislation and standards in the field of architecture, urban planning, and construction of the Republic of Kazakhstan.

3) Implementing energy management.

Energy management should be considered a system for managing energy conservation. It should combine both managerial and technical aspects (Figure 1). The energy management system is a set of interrelated and interacting structural

elements of the organization, based on the organization's formulated energy policy, goals, and objectives of energy efficiency, as well as mechanisms (special processes and procedures) that enable the achievement of the required level of energy efficiency.

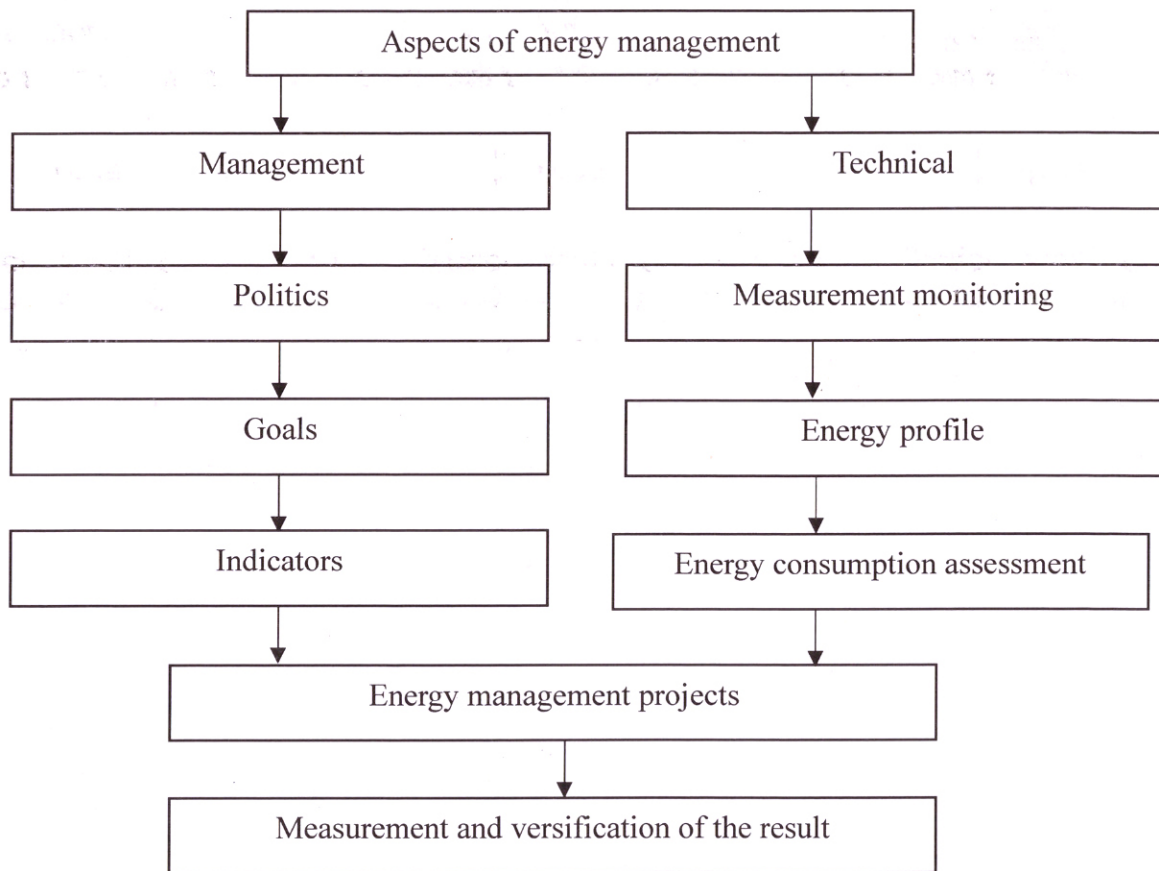


Fig. 1. Combination of managerial and technical aspects of energy management