Approved
By decision of the Board
NJSC "Astana Medical University"
No. ___ from "___" _____ 2026

UNIVERSITY STANDARD

INTEGRATED MANAGEMENT SYSTEM

ENERGY MANAGEMENT AND ENERGY SAVING

SU-MUA-53-01-26

Astana

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PREFACE

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1.Purpose and scope of application

1. This Standard establishes the requirements for the energy management system of NJSC Astana Medical University (hereinafter referred to as the University) in accordance with the requirements of the national standard of the Republic of Kazakhstan ST RK ISO 50001-2019.

2. The standard is aimed at improving energy efficiency, rational use of fuel and energy resources, reducing environmental impact and contributing to the achievement of UN SDGs 7 “Affordable and clean energy”, 12 “Responsible consumption and production” and 13 “Climate action”.

3. The requirements of the standard apply to all types of educational, scientific, clinical and administrative-economic activities, processes and facilities of the University related to energy consumption and energy use, under the control or influence of the University.

2. Normative references

4. This standard contains references to the following regulatory documents:

1) ST RK ISO 50001-2019 "Energy management systems. Requirements with guidance for use";

2) ISO 50001:2018 Energy management systems — Requirements with guidance for use;

3) Law of the Republic of Kazakhstan dated January 13, 2012 No. 541-IV “On energy saving and improving energy efficiency”;

4) ST RK ISO/PAS 50010-2023 (for reference, when considering promising solutions in the field of energy efficiency);

5) ST RK ISO 9001-2016 “Quality management systems. Requirements”;

6) ST RK ISO 14001-2016 "Environmental management systems. Requirements with guidance for use";

7) ST RK ISO 45001-2019 "Occupational health and safety management systems. Requirements with guidance for use";

8) ST RK ISO 31000-2019 "Risk management. Principles and guidelines" (for taking risks into account when planning energy-saving measures);

9) Order of the Minister of Investment and Development of the Republic of Kazakhstan dated March 31, 2015 No. 387 “On approval of the Rules for the formation and maintenance of the State Energy Register”;

10) applicable regulatory legal acts of the Republic of Kazakhstan in the field of energy efficiency and energy reporting (the current list is checked during the annual assessment of legal requirements);

11) SU-MUA-37-01-25 “General requirements for the content, presentation and design of documentation of the integrated management system”;

12) SU-MUA-37-02-25 "Documentation Management";

13) SU-MUA-20-03-24 "Records Management";

14) SU-MUA-36-07-26 "Internal audit of the integrated management system".

3. Terms and definitions

5. The standard uses the terms and definitions of ISO 50001:2018.

Table 1. Terms and definitions

Terms	Definitions
Energy efficiency	measurable results related to energy efficiency, energy consumption and energy use.
Continuous improvement	recurring activities to improve energy performance
Risks and opportunities of energy management.	Internal and external factors that can influence the achievement of energy management goals.

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Documented information	information subject to management and maintenance by an organization, regardless of form and medium.
Energy monitoring	systematic collection, analysis and evaluation of energy consumption data.
Energy audit	A systematic assessment of energy consumption and energy efficiency of university facilities, conducted in accordance with the legislation of the Republic of Kazakhstan to identify opportunities for improvement.
Energy Management System (EMS)	A set of interrelated processes for managing energy consumption and energy performance.
Energy efficiency	Measurable results related to energy efficiency, energy use and energy consumption.
Energy Performance Index (EnPI)	A quantitative measure of energy performance established for monitoring and comparison.
Energy Baseline (EnB)	A quantitative basis for comparing energy performance over a given period.
Significant energy use	An energy use activity with significant energy consumption and/or potential for improvement.
Energy consumption	Amount of energy used.
Energy use	A method or type of energy application.
Representative period	An observation period whose data are suitable for reasonable comparison.
Relevant variables	Quantitative factors that change and significantly influence energy consumption.
Static factors	Relatively stable conditions affect energy performance.
Energy profile	General characteristics of the types and volumes of energy consumption of facilities.
Energy balance	Comparison of the receipt and distribution of energy within given boundaries.
Carbon footprint	An estimate of the greenhouse gas emissions associated with a given activity, expressed in CO_2 equivalent.
Sustainable Development Goals (SDGs)	The goals of the UN 2030 Agenda for Sustainable Development.

4. Abbreviations and designations

6. This standard uses the abbreviations and designations given in Table 2.

Table 2. Abbreviations and designations

Item No.	Designations and abbreviations	Full name of the given designations and abbreviations
1.	**ISO/ISO**	International Organization for Standardization
2.	**NAO MUA**	JSC "Astana Medical University"
3.	**ISM**	Integrated management system
4.	**RK**	Republic of Kazakhstan
5.	**DAiUK**	Department of Accreditation and Quality Management
6.	**SP**	Structural division
7.	**SU**	University Standard
8.	**SEM**	Energy Management System
9.	**TER**	Fuel and energy resources
10.	**DIiE**	Department of Infrastructure and Operations.
11.	**SEU**	Significant Energy Use.

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12.	**EnPI**	Energy Performance Indicator.
13.	**EnB**	Energy Baseline.
14.	**GER**	State Energy Register of the Republic of Kazakhstan.

5. Responsibility and authority

7. The Chairman of the Management Board—the Rector—provides overall leadership in the area of energy conservation. The Director of the Department of Energy and Power Engineering organizes the implementation of this standard, reviews monitoring results, ensures the preparation of proposals for improvement, and approves the energy report. The energy report is approved by the Managing Director overseeing the Department of Energy and Power Engineering or another authorized official, as assigned by the University.

8. The DIiE power engineer collects and analyzes data on electricity and heat consumption, maintains a register of metering devices and monitors their calibration dates, calculates EnPI and EnB, prepares data for the GER and indirect emissions assessment, develops energy conservation proposals and drafts the annual energy report. This standard does not establish a separate energy manager position or energy team.

9. Heads of structural divisions ensure compliance with the requirements of the standard within the limits of their operational responsibility and involve staff/trainees in energy saving processes.

10. The Director of the Department of Energy and Power Engineering organizes the preparation and internal verification of information for the State Energy Register (SER). The power engineer prepares the initial data and draft reporting forms; the information is submitted by the University's authorized representative in the manner and within the timeframes stipulated by the legislation of the Republic of Kazakhstan, upon confirmation of the SER subject's status.

11. The legal department advises the Department of Economic Development and Trade on changes in legislation; the department responsible for internal audits of the IMS organizes the audit; department heads ensure the implementation of corrective measures within their competence.

12. The energy report is coordinated and approved as follows: power engineer (preparation) → director of the Department of Energy and Power Engineering (review and approval) → managing director overseeing the Department of Energy and Power Engineering or another authorized person (approval). The authority of the approver is confirmed by the University's current administrative documents.

Responsibility distribution matrix in the EMS

Table 2 – Responsibility Assignment Matrix (RAM)

Activities/Responsibilities	**Chairman of the Board - Rector**	**Energy Electrical Engineer**	**Director of DIiE**	**Department of and Planning Economic Analysis**	**Department of Organization and Monitoring of Public Procurement**
Implementation of energy saving principles		AND	ABOUT		
Development and updating of the standard		AND	ABOUT		
Energy accounting and EnPI/EnB calculation		AND	ABOUT		
Preparation and approval of an energy report		AND	WITH		

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Preparing information for the State Environmental Monitoring Survey		AND	ABOUT		
Development of energy saving measures		AND	ABOUT	WITH	
Informing employees and students		AND	ABOUT		
Purchase of energy-efficient equipment		WITH	WITH		AND
Formation of event budgets		WITH	WITH	AND	
Modernization of engineering systems		AND	ABOUT	WITH	

Note – The following notations are used in the table:

- *I – Contractor directly performs the work, prepares documents, calculations and necessary information.*
- *O – Responsible: organizes the execution of work, exercises control and is responsible for its results within the limits of established authority.*
- *C – Coordinator participates in the review and approval of documents, decisions or events within the scope of their competence*.

6. Main part

13. The energy management system is an integral part of the University's IMS and operates based on the PDCA (Plan-Do-Check-Act) management cycle with a strong focus on continuous improvement of results.

14. Basic principles of energy management and energy saving

1) The University is guided by the principles of rational use of energy resources, improving the energy efficiency of buildings and equipment, compliance with applicable legal requirements, continuous improvement of energy performance, and contributing to the achievement of SDGs 7, 12, and 13. These principles are enshrined in this standard; a separate energy policy is not established within the framework of this standard.

2) Energy conservation principles are communicated to employees and students through accessible internal communication channels. Technical feasibility, safety, costs, and expected impact are considered when making decisions.

15. Energy planning

1) Energy planning at the University is carried out based on the requirements of the current legislation of the Republic of Kazakhstan, obligations within the framework of the State Energy Register (SER), national standards, as well as internal sustainable development goals.

Planning covers:

analysis of legal requirements and monitoring of changes in the regulatory legal acts of the Republic of Kazakhstan;

determination of the current energy profile of the university;

assessment of the baseline energy consumption (EnB);

establishment and revision of energy performance indicators (EnPI);

formulation of goals, objectives and programs to improve energy efficiency.

2) The power engineer at the Department of Energy and Power Engineering (DEEE) checks official sources for changes to applicable regulatory legal acts in the areas of energy conservation, energy efficiency, and energy metering at least quarterly. Together with the legal department, they assess the

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applicability of the changes. The result is documented as a list of applicable requirements (a register) with the verification date and, if necessary, proposals for updating the documents. The Director of DEEE reviews the proposals within 10 business days of their receipt.

3)The University's baseline energy status is determined by analyzing reliable data on fuel and energy resource (FER) consumption collected over a representative period. Data collection and processing are performed annually using approved forms and specialized energy management software. The results of the analysis are used for:

assessment of the actual energy efficiency of buildings and infrastructure;

identification of significant energy use areas (SEU);

accurate determination of hidden energy saving potential.

4) The baseline energy consumption level (BEL) is determined based on reliable data for a documented, representative period. The power engineer verifies the comparability of the BEL annually and additionally whenever there are significant changes in the area, purpose of the facilities, operating mode, number of users, or other significant factors. The revision is documented in a calculation memo with the initial data and justification; the Director of the Department of Electrical Engineering and Electrical Engineering approves the change, and an authorized University official approves the change to the BEL.

5)To ensure effective planning and control, the University defines and updates key energy performance indicators (EnPIs). The list of EnPIs, their calculation methods, and the principles of climate and holiday normalization are provided in Appendix 2.

6) Energy conservation goals and activities are established based on actual data, technical capabilities, and available funding. Responsible individuals, deadlines, and performance indicators are identified for each activity. The Department of Energy prepares draft plans and submits them for approval and confirmation in accordance with the University's established procedures.

The planning process is regulated by the diagram presented in Figure 1.



Figure 1. Planning process in the energy management system

16. Functioning of the energy management system

1) The University’s activities in the field of energy conservation are carried out on the basis of this standard, maintenance plans and approved measures to improve energy efficiency.

2) The University regularly implements activities to inform and raise awareness among staff and students in energy conservation. These activities include:

communicating the goals of the SEnM and the principles of the “Green Campus” to staff and student government;

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information on the current state of energy consumption and the results achieved;

formation of a culture of careful attitude towards energy resources in everyday educational and household activities.

3) Raising awareness among employees whose activities impact energy consumption is organized by the Department of Energy and Energy in conjunction with relevant departments as needed. Effectiveness is assessed based on practical compliance with energy conservation requirements.

4) Documented information of the Energy Management System (EMS) is generated and stored by responsible executors at the place of its creation, and its registration, access, protection, storage periods, and destruction are regulated by internal standards SU-MUA-37-02 and SU-MUA-20-03 and the approved nomenclature of university files. The power engineer ensures the safety of the working calculations and energy data of the DIiE; the original of this standard is stored in the DAiUK.

5) The power engineer, no later than the 10th business day of the following month, compiles a summary of electricity and heat consumption by facility based on meter readings and billing documents. Quarterly, he or she prepares a brief analytical report on deviations and the implementation of measures and submits it to the Director of the Department of Electrical Engineering and Power Engineering. The annual analysis, EnPI calculations, and EnB validation are completed by February 1 of the year following the reporting year.

Energy consumption and energy performance monitoring are carried out throughout the entire life cycle of facilities, processes, equipment and services that impact energy consumption.

6) The exchange of information is carried out in accordance with the procedure established by the University's internal regulations on documentation and information management, taking into account the requirements of the IMS in the field of labor protection and ecology.

7) When implementing energy-saving measures (including modernization of heating and lighting systems), actual energy costs must be monitored, and the real economic effect must be assessed.

8) When preparing technical specifications for equipment procurement, applicable energy efficiency requirements, available energy consumption classes, operating costs, and technical compatibility are considered. The specific class is determined for the corresponding equipment category, rather than being set by a uniform "A/A+" requirement for all purchases.

9) The University has established criteria for assessing the energy consumption of equipment operated beyond its planned (depreciated) service life. The assessment results are used when making investment decisions about replacing or upgrading equipment.

10) To ensure the efficient functioning of systems at the University's facilities, the Department of Infrastructure and Operations carries out the following maintenance activities:

Scheduled inspections and repairs: Conducting regular checks of the performance of individual heating units, automated metering units, electrical panels, and lighting systems according to approved schedules. Timely equipment replacement: Replacing worn components and parts (faucets, fittings, insulation) that directly impact resource loss.
Automation and sensors: Installation and regular testing of automation systems: presence (motion) sensors in common areas, classrooms and corridors, as well as water leakage monitoring systems to prevent accidental losses.
Energy-efficient mode: Setting up automatic heating units to switch the building heating systems to economy mode (temperature reduction at night, reduction on weekends and holidays when there is no educational process).

17.**Energy efficiency check**

1) The University systematically monitors and evaluates its energy performance. Key performance indicators include:

actual results of energy consumption analysis;

significant energy use (SEU) data;

relationships between the power plant and load factors, including the use of energy balances and energy flow diagrams (Senki diagrams);

dynamics of indicators (EnPI);

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assessment of the effectiveness of the implementation of programs and work plans to achieve goals and objectives in the field of energy management.

the degree of implementation of annual Energy Conservation Programs.

2) The power engineer maintains a register of measuring instruments with the dates of their next verification, checks the deadlines quarterly, and submits a request for verification to the Director of the DIiE in advance. The Director of the DIiE ensures that verification is organized through competent authorities and authorized organizations, where applicable. Supporting documents are stored at the DIiE in accordance with the file nomenclature.

3) An assessment of compliance with applicable legal requirements in the field of energy conservation is conducted by the Department of Energy and Power Engineering (DIE) jointly with the legal department at least once a year, before February 1. The result is a report (or register) containing notes on compliance with requirements, identified risks, and proposals. The Director of DIE reviews this report and, if necessary, initiates corrective actions.

4) The energy engineer prepares the annual energy report for the previous calendar year by February 15. The Director of the Department of Energy and Power Engineering reviews and approves the draft by February 22; approval by the authorized official is planned no later than March 1. If the deadlines coincide with non-working days, the next working day applies. The report contains energy consumption volumes, EnPI dynamics, EnB assessment, event results, verification information, legal requirements, non-conformities, GER, and SDG indicators, if reliable data is available.

5) For the State Energy Survey, the power engineer generates and verifies the initial data on energy resource consumption and metering devices by March 1. The Director of the Department of Energy and Power Engineering reviews it by March 10; the University's authorized representative ensures the submission of reports within the statutory deadline (usually by April 1 of the year following the reporting year) and retains proof of submission. The forms and submission obligations are verified against the current version of the State Energy Survey rules.

6) The results of monitoring and assessment are recorded in a monthly energy consumption statement, a quarterly analytical report, an annual energy report, a register of applicable legal requirements, and a register of corrective actions. The Director of the Department of Energy and Power Engineering reviews the quarterly report within 10 business days of its submission; in the event of significant deviations, he or she issues instructions specifying the executor and deadline.

7) To calculate indirect emissions from purchased electricity and heat, the energy engineer provides initial data annually by February 1. An authorized contractor performs the calculation using a documented methodology, specifying coefficients, calculation boundaries, and sources. The result is reviewed by the Director of the Department of Energy and Environmental Protection and submitted to the unit responsible for sustainability reporting. Without confirmed coefficients, no quantitative indicator is declared.

8) Internal audits regarding the requirements of this standard are organized by the unit responsible for internal audits of the IMS, according to an approved plan in accordance with SU-MUA-36-07-26. Auditors prepare a report; the results are sent to the head of the unit being audited and to the authorized IMS unit. The DIiE ensures the provision of supporting records and the implementation of agreed-upon actions to address identified nonconformities.

9) If a nonconformity is identified, the power engineer or responsible employee records it in the register (certificate, report), informs the Director of the Department of Electrical Engineering and Power Engineering, and proposes corrective measures. The Director of the Department of Electrical Engineering and Power Engineering appoints the responsible person and the deadline, examines the causes, and approves a corrective action plan. Compliance and effectiveness are verified in accordance with the University's established nonconformity management procedure. If necessary, materials are forwarded to the IMS department.

10) Management reviews energy management results at least annually within the framework of the current IMS review procedure. The Director of the Department of Energy and Environmental Protection presents a summary of the EnPI, EnB, implementation of measures, applicable legal requirements, audits,

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nonconformities, and corrective actions. The results of the review are recorded in a protocol or a decision by the authorized manager, with assignments, deadlines, and responsible executors.

11) For each indicator, the data source, period, calculation method, and responsible person are indicated. If the composition of the objects changes, comparisons are performed only under comparable conditions.

12) The power engineer prepares a summary of indicators for the reporting year annually. The Director of the Department of Energy and Power Engineering reviews the summary and distributes it to the relevant departments for sustainable development reporting. Baseline and target values are established separately based on verified data.

13) SDG 13: The University contributes to reducing the impact of climate change through the rational use of energy resources, the implementation of energy saving measures and improving the energy efficiency of buildings and engineering systems.

Considering the centralized heat supply of educational buildings, in the presence of the necessary initial data and an approved methodology, an assessment of indirect greenhouse gas emissions associated with the consumption of purchased electrical and thermal energy can be carried out (Scope 2).

14) SDG 12: DI&E takes into account the energy saving measures taken, including modernization of lighting, heat management and improvement of the energy efficiency of equipment.

15) SDG 7: The SDGs monitor annual electricity and heat consumption and, where comparable data are available, the specific energy consumption per unit area.

16) Considering the contribution to achieving the Sustainable Development Goals

7. Recordings

18. Records generated within the framework of this standard are subject to management in accordance with SU-MUA-37-02, SU-MUA-20-03, and the approved nomenclature of files of the University. Record forms, responsible executors, frequency, and storage locations are provided in Table 4. Storage periods are determined by the current nomenclature of files and mandatory regulatory requirements.

Table 4 List of records

tem No.	Name of records	Form of entries	Responsibility for management	Storage location	Shelf life	Periodicity
1.	Energy consumption data	Appendix 2; monthly statement	Electrical Energy Engineer	DIiE	According to the nomenclature of cases	Monthly, summary annually
2.	Register of metering devices	Register / journal	Electrical Energy Engineer	DIiE	According to the nomenclature of cases	As changes occur; check quarterly
3.	Thermal energy balance	Electronic spreadsheet	Electrical Energy Engineer	DIiE	According to the nomenclature of cases	Annually / when changes occur
4.	Electric energy balance	Electronic spreadsheet	Electrical Energy Engineer	DIiE	According to the nomenclature of cases	Annually / when changes occur
5.	Basic energy consumption level EnB	Calculation and justification of changes	Electrical Energy Engineer	DIiE	According to the nomenclature of cases	Review annually; revise if significant changes occur
6.	Goals and action plan for energy conservation	Plan with responsibilities and deadlines	DIiE	DIiE	According to the nomenclature of cases	Annually/upon update

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7.	Energy consumption analysis	Quarterly report; annual analysis	Electrical Energy Engineer	DIiE	According to the nomenclature of cases	Quarterly and annually
8.	EnPI and EnB calculations	Calculation tables, methodology	Electrical Energy Engineer	DIiE	According to the nomenclature of cases	Annually / upon review
9.	Annual Energy Report	Report with approval sheet	Electrical Energy Engineer	DIiE	According to the nomenclature of cases	Every year before March 1st
10.	Verification of measuring instruments	Certificates/verification information	Responsible technical workers of the Department of Electrical Engineering	DIiE	According to the nomenclature of cases	According to the verification schedule
11.	Monitoring changes to regulatory legal acts and assessing compliance	Register of claims, annual report	DIiE together with the legal department	DIiE	According to the nomenclature of cases	Monitoring quarterly; evaluation annually
12.	Results of internal audits	Audit report	Authorized division of the ISM	ISM division	According to the nomenclature of cases	According to the audit plan
13	Management review	Protocol/solution	Authorized division of the ISM	ISM division	According to the nomenclature of cases	At least once a year
14	Nonconformities and corrective actions	Act / register / action plan	Responsible departments	By place of formation	According to the nomenclature of cases	As identified and implemented
15	Information provided in the State Register	Reporting forms and confirmation of submission	Authorized Person of the University; prepared by DIiE	DIiE / authorized division	According to the nomenclature of cases	Every year according to the law
16	SDG indicators 7, 12 and 13	Appendix 6; calculation tables	Electrical Energy Engineer	DIiE	According to the nomenclature of cases	Annually
17	Initial data and calculation of indirect emissions	Data sheet, calculation with coefficients	DIiE (data); authorized executor (calculation)	DIiE / responsible department	According to the nomenclature of cases	Annually, if there is a methodology

Note: The retention periods for records generated within the framework of this standard are determined in accordance with the approved nomenclature of university files, taking into account the requirements of the legislation of the Republic of Kazakhstan. Responsibility for ensuring the safety of documented information lies with the structural units in which the relevant records are generated and stored.

8. Revision, modification, storage and distribution

15. The revision, amendment, storage and distribution of this standard shall be carried out in accordance with the procedure for managing internal regulatory documentation established at the University.

16. The original of this University standard with a copy of the extract of the minutes of the meeting of the Board of Directors of the Astana Medical University JSC is registered and stored in the Department of Accreditation and Quality Management.

17. A scanned version of this University standard is posted in three languages on the University's official website in the "Employees" section.

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Appendix 1
Form "List of objects

List of facilities of JSC Astana Medical University included in the energy management system.

Item No.	Objects	Types of consumed fuel and energy resources
1	Educational building on Saryarka Ave., 33	Thermal energy, electric energy,
2	Educational building on Beibitshilik Street, 49	Thermal energy, electric energy,
3	Educational building on Beibitshilik Street, 49A	Thermal energy, electric energy,
4	Educational building on Beibitshilik Street, 51	Thermal energy, electric energy,
5	Educational building on Beibitshilik Street, 53	Thermal energy, electric energy,
6	Dormitory on Zhenis Ave., 35, 35A	Thermal energy, electric energy,
7	Academic building at 47 Abay Street	Thermal energy, electric energy,
8	Motor transport	fuels and lubricants

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Appendix 2
Energy Consumption Data Collection and Analysis Form
F-09.03/5

Form for monthly energy consumption accounting and annual calculation of energy performance indicators (EnPI) for 20__

Table 1. Accounting for energy resource consumption

Month	Electricity, kW h	Thermal energy, Gcal	Water, m³ (separately)	Energy, T.C.E. (without water)	Number of people	EnPI, tons of fuel/person
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						
Total for the year / average for the year						

Note: Water is reported separately and is not included in total energy consumption (t.c.e.). Annual EnPI is calculated based on the annual energy volume and the comparable average annual population, not as the arithmetic mean of monthly EnPI.

Table 2 — Energy performance indicators (EnPI) by facilities and types of energy use.

Indicator	**Units of measurement**	**Object/accounting boundary**	**Actual value for the year**	**Data source**
Specific consumption of electrical energy	kW h/m²	Each building / University		Metering devices, area
Specific consumption of thermal energy	Gcal/m²	Every heated building / University		Metering devices, heated area
Specific total energy consumption	tons of fuel/person	University		Table 1, numbers
Electricity consumption by facilities	kW h	Each object		Readings, accounts
Thermal energy consumption by facilities	Gcal	Each object		Readings, accounts

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Significant energy uses (if metered)	kWh, Gcal or others.	Equipment/systems		Accounting / calculation

Table 3 - Data for climatic normalization of heat consumption.

Indicator	**Units of measurement**	**Base period**	**Reporting year**	**Source / Methodology**
Duration of the heating period	days			Heating period data
Heating degree day (HDD)	°C·day			Meteorological data and accepted base temperature
Actual consumption of thermal energy	Gcal			Meters/counters
Normalized heat consumption	Gcal			Documented methodology
Deviation from the EnB baseline	%			Calculation taking into account comparability

Explanations of the form

1. Data on electric and thermal energy is entered monthly based on meter readings and supporting documents. Thermal energy is recorded in Gcal; if the initial data is in MWh, the conversion is documented.

2. The total consumption of energy resources in tons of equivalent fuel (tce) is calculated based on the conversion factors established by Appendix 3 to the Rules for the formation and maintenance of the State Energy Register, approved by Order of the Minister of Investment and Development of the Republic of Kazakhstan dated March 31, 2015 No. 387 (registered in the Ministry of Justice of the Republic of Kazakhstan under No. 11728), as amended by Order of the Acting Minister of Industry and Construction of the Republic of Kazakhstan dated June 24, 2026 No. 332.

The following coefficients are used in the calculation:
electrical energy - 0.000123 t.e.f./kW h;
thermal energy - 0.143 t.e.f./Gcal.

Water consumption is recorded separately in cubic meters and is not included in the calculation of total energy consumption in tons of reference fuel. If the standard coefficients change, calculations are carried out in accordance with the current version of the regulatory legal act.

3. Water (m^3) is considered separately for resource conservation purposes and is not included in the energy calculation (t.e.f.).

4. To assess EnPI, the following indicators are used: kWh/m^2, Gcal/m^2, Tce/person, as well as consumption for each facility and for significant types of energy use, if the initial data are available. Areas, metering boundaries, and the procedure for determining the number of people are recorded and used consistently.

5. Climate-based heat consumption normalization is performed taking into account the duration of the heating season and heating degree days (HDD) in accordance with the climatic conditions of the University's facilities. Cooling degree days (CDD) are additionally taken into account only for facilities with significant cooling energy consumption.

6. When the area, number of buildings, operating mode, and number of users change, the indicators are adjusted to comparable conditions; assumptions and adjustments are reflected in the calculation. If significant changes occur, the EnB baseline is revised.

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7. The DIEE energy engineer collects data monthly, calculates indicators annually, and submits the results to the DIEE director for review. The information is used for the annual energy report and for reporting on SDGs 7, 12, and 13.

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Appendix 3
Form "Annual records of energy use by type of energy carrier"
F-09.03/6

Annual balance of energy use by energy carriers (20_year)

Table 4. Energy use by energy carriers

Energy carrier	**Annual consumption volume (MWh/year)**	**Share of total energy consumption (%)**	**Energy costs (tg/year)**	**Cost share (%)**	**Greenhouse gas emissions, t CO_2-eq/year**	**Share of greenhouse gas emissions, %**	**Measuring system/data source**	**Measurement error, %**
Electricity								
Thermal energy								
Gas (if available)								
Other (specify)								
Total		100%		100 %		100		

Explanations of the form

1. To ensure data comparability, annual energy consumption volumes are converted to a single unit of measurement—MWh—using documented conversion factors. The original values for electrical energy in kWh and thermal energy in Gcal are retained in the calculation materials.

2. Indirect greenhouse gas emissions associated with purchased electricity and heat (Scope 2) are calculated with the necessary initial data using a documented methodology, specifying the emission factors used, their sources, and calculation boundaries. Mandatory state environmental reporting is carried out in cases stipulated by the legislation of the Republic of Kazakhstan.

3. These tables are used for annual energy consumption analysis, energy performance assessment (EnPI), and comparison of actual performance against the established energy consumption baseline (EnB). The EnB baseline is revised in the event of significant changes in energy use conditions that affect the comparability of performance indicators, with documented justification for the adjustments made.

4. The power engineer of the DIiE ensures the collection and summarization of data, the formation of an annual energy balance and the presentation of the results to the director of the DIiE for review.

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Appendix 4
Form "Annual records for energy consumption facilities"
F-09.03/7

Annual records of energy consumption by facilities for 20__

Criteria for identifying significant energy uses (SEUs)

The classification of the University's facilities, engineering systems and equipment as significant energy uses (SEU) is carried out according to the following criteria:

1. Energy consumption volume: the object, system or equipment consumes at least 10% of the annual energy volume within the established metering boundary.
2. Total contribution: the facility belongs to a group of major consumers, determined in descending order of annual energy consumption and accounting in total for at least 80% of energy consumption within the established metering boundary.
3. Improvement Potential: The facility, system or equipment has documented significant potential to improve energy performance, regardless of its energy consumption share.

The threshold values of 10% and 80% are internal criteria of this standard and do not relate to mandatory normative requirements of ISO 50001.

In the absence of separate instrument metering, a calculated estimate of energy consumption is allowed, indicating the initial data, assumptions, and the method used.

SEU identification is conducted by the DIiE power engineer annually and whenever significant changes in energy use conditions occur. The results are submitted to the DIiE director for review.

Table 5 - Identification and annual accounting of significant energy uses (SEUs)

No.	Object / system / equipment	Accounting boundary	Type of energy	Annual consumption, MWh	Share of consumption, %	SEU criterion (1, 2 or 3)	Reason/potential for improvement	Accounting method
1.								
2.								
3.								
4.								

Procedure for filling and evaluation

1. The accounting boundary may be the University as a whole, a specific building, a utility system, or equipment. For each object, the accounting boundary is indicated in the table.
2. The energy consumption share is defined as the ratio of a facility's annual energy consumption to the total annual energy consumption within the relevant metering boundary, expressed as a percentage. Electrical and thermal energy are converted, if necessary, to a single energy unit using documented conversion factors. Water consumption is not included in the energy total.
3. When identifying SEUs based on the improvement potential criterion, documentary justification is provided: identified energy losses, inefficient operating modes, survey results, or a calculated estimate of potential savings.
4. When analyzing heat consumption, the duration of the heating period and the heating degree day (HDD) are taken into account. The comparison of indicators is carried out taking into account climatic conditions, operating mode, and other significant factors affecting energy consumption.
5. Annual consumption volumes are determined based on meter readings and supporting documents. In the absence of individual metering, documented calculations may be used, specifying the initial data and method.
6. When forming the overall energy balance, double counting of energy consumption of buildings and the engineering systems that comprise them is eliminated.

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Table 6 - Additional operating parameters (if necessary)

Object / system / equipment	**Heat output/temperature conditions**	**Energy performance indicators**	**Comments**

Identification result

Based on the analysis results, a list of significant energy uses (SEU) is generated, indicating the selection criteria, energy consumption volumes, and initial data.

Objects that do not meet the established criteria are not included in the SEU list but are taken into account in the overall energy balance of the University.

Periodicity

Identification and assessment of SEUs are conducted annually based on the results of the calendar year.

An unscheduled review is carried out when buildings and equipment are commissioned or decommissioned, operating modes are changed, or the structure and volume of energy consumption significantly changes.

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Appendix 5
Form "List of control indicators"
F-09.03/8

List of performance indicators for 20__

For each indicator, the unit of measurement, calculation method, base, planned and actual values, data source, calculation frequency and responsible executor are indicated.

The key energy performance indicators (EnPI) are the specific consumption of electricity and heat, the specific total energy consumption, and the deviation of normalized heat consumption from the baseline. Financial and environmental indicators are additionally used to monitor costs and environmental impacts.

When analyzing heat consumption, climatic conditions are taken into account, including the heating degree-days of the heating season. Water consumption is accounted for separately and is not included in the total energy consumption.

Table 7 — List of energy performance indicators (EnPI) and additional monitoring indicators

No.	Benchmark	Units of measurement	Calculation method	Base value	Planned value	Actual value	Data source	Periodicity	Responsible
1	Specific energy consumption by facility (EnPI)	kW h/m²	Annual electricity consumption of the facility (kWh) / the area of the facility (m²)	—	—	—	Meters, bills, area information	Annually	Electrical Energy Engineer
2	Specific heat consumption per facility (EnPI)	Gcal/m²	Annual thermal energy consumption of the facility (Gcal) / heated area of the facility (m²)	—	—	—	Meters, bills, information on heated area	Annually	Electrical Energy Engineer
3	Specific energy consumption per metered user (EnPI)	tons of fuel/person	Total annual energy consumption (t.e.f., excluding water) / average annual number of registered users (people)	—	—	—	Appendix 2; Confirmed information on the contingent and personnel	Annually	Electrical Energy Engineer
4	Specific energy costs per student	tg/student	Actual annual energy costs (TJS) / average annual number of students (people)	—	—	—	Financial documents; information on the contingent	Annually	Power engineer of the Department of Electrical Engineering and Electrical Engineering together with

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									the financial department
5	Cost per unit of energy consumed	tg/t.u.t.	Actual annual energy costs (tg) / total annual energy consumption (t.e.f.)	—	—	—	Financial documents; Appendix 2	Annually	Power engineer of the Department of Electrical Engineering and Electrical Engineering together with the financial department
6	Specific indirect greenhouse gas emissions per student	t CO_2-eq/student	Estimated indirect emissions from purchased electricity and heat energy (t CO_2-eq.) / average annual number of students (people)	—	—	—	Energy consumption data; documented methodology and emission factors; population information	Annually, subject to calculation	Authorized executor; power engineer provides initial data
7	Deviation of normalized heat consumption from the baseline (EnPI)	%	(Normalized heat consumption of the reporting year (Gcal) / comparable base heat consumption EnB (Gcal) − 1) × 100%	—	—	—	EnB calculations; heating degree-day data	Annually, if data is available	Electrical Energy Engineer

Explanations of the form

1. Baseline, planned, and actual values are completed for each indicator and object (if applicable). If there is no approved planned value, the corresponding column is marked "Not established." Substituting estimated data for actual values is not permitted.

2. The base period and accounting boundaries must be comparable to the reporting period. If the composition of buildings, area, operating mode, and number of users changes, the indicators are adjusted according to the documented methodology or accompanied by an explanation of the incomparability.

3. For unit area figures, the documented area of the relevant facility is used. When calculating specific heat consumption, the heated area is used. For per capita figures, the average annual number of users of the relevant category is used, indicating the data source and calculation method.

4. The "Unit Energy Costs per Student" and "Unit Cost of Energy Consumed" indicators characterize financial costs and are not direct indicators of physical energy performance. The indicator for specific greenhouse gas emissions characterizes environmental impact and does not replace the EnPI indicators.

5. Calculation of indirect greenhouse gas emissions is carried out using a documented methodology, emission factors, and verifiable input data. Indirect emissions from purchased electricity and heat are taken into account. Water consumption is not included in energy calculations.

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6. When assessing heat consumption, the duration of the heating period, heating degree days (HDD), and other significant factors are considered. A comparison of normalized heat consumption with the baseline (EnB) is conducted under comparable conditions.

7. The DIEE power engineer annually prepares a control indicator calculation table, specifies the initial data used, submits the results to the DIEE director for review, and includes them in the annual energy report. The deadlines for report preparation, approval, and approval are defined in the main part of the standard.

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Approval sheet

Item No.	Job title	Full name	Date of approval	Signature
1	Vice-Rector for Academic Affairs	Dosanova A.K.		
2	Vice-Rector for Research	Shulgau Z.T.		
3	Vice-Rector for Clinical Work	Shakenov A.D.		
4	Vice-Rector for Strategic Development and International Cooperation	Myssaev A.O.		
5	Managing Director	Ermekov U.M.		
6	Director of the Department of Accreditation and Quality Management	Zhunusova A.B.		
7	Head of the Legal Support Department	Tukbekova M.E.		
8	Director of the Department of Infrastructure and Operations	Orazbaeva S.E.		

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Change Registration Sheet

Item No.	Sheet (page) numbers				Total sheets	The number of the section, subsection, or clause of the standard to which the changes relate	Signature of the person who made the changes	Date of change
	Changed	Replaced	New	Cancelled				

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Familiarization sheet

Item No.	Job title	Full name	Date of familiarization	Signature

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