MINISTRY OF EDUCATION AND SCIENCE
REPUBLIC OF KAZAKHSTAN

NON-PROFIT JOINT-STOCK COMPANY
"KAZAKH NATIONAL RESEARCH NATIONAL TECHNICAL UNIVERSITY named after K.I. SATBAEV".

APPROVED
Member of the Board - Vice-Rector for Corporate Development and Strategic Planning
NJSTC "KazNRTU named after K.I.Satbayev"
_____ Kuldeev E.I.

DEVELOPMENT STRATEGY
Institute of Energy and Mechanical Engineering
for 2023-2027

Almaty 2023

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MINISTRY OF SCIENCE AND HIGHER EDUCATION

Contents

1. Introduction

The Development Strategy Passport of the Institute of Energy and Mechanical Engineering for 2023-2027 is presented in the Strategy; Description of the prospects for the development of the Institute of Energy and Mechanical Engineering, its current status, and long-term objectives; Analytical and prognostic justification section of the Development Strategy – analysis of operational status, key challenges, and their causes; Assessment of the innovative potential of the team; Forecast of labor market trends concerning workforce requirements; Vision of the Development Strategy; Mission of the Development Strategy.

Primary strategic section of the plan – the place and role of the Institute of Energy and Mechanical Engineering within the system of higher and postgraduate education in Kazakhstan; academic policy; Development of innovative potential and its implementation; Commercialization of scientific and technical developments; Ways to achieve the established objective; Description of the expected results of the Strategy implementation; Information on the implementation progress broken down by year with an indication of target indicators.

The strategic plan is intended for university administration staff, faculty, students, all interested parties, and the general public.

Development Program Passport

Name of the Development Program	Development Program for the A. Burkitbayev Institute of Power Engineering and Mechanical Engineering of the K.I. Satpayev Kazakh National Research Technical University for 2023-2027.
Basis for development	State program for the development of education and science Republic of Kazakhstan for 2020–2025 (hereinafter referred to as the Program) Decree of the President of the Republic of Kazakhstan dated February 15, 2018 No. 636 “On approval of the Strategic Development Plan of the Republic of Kazakhstan until 2025 and recognition of certain decrees of the President as invalid” Republic of Kazakhstan"; Address by the Head of State Kassym-Jomart Tokayev to the people of Kazakhstan: "Constructive public dialogue is the foundation of stability and prosperity in Kazakhstan" Address by Head of State Kassym-Jomart Tokayev to the people of Kazakhstan: "Kazakhstan in the New Reality: Time for Action"
Developers	Institute of Power Engineering and Mechanical Engineering named after A. Burkitbaev (hereinafter referred to as IEiM).
Target	Providing students with high-quality, practice-oriented education. Providing economic sectors with competitive personnel with higher and postgraduate education.
Tasks	Ensuring high-quality training of highly qualified competitive personnel. Modernization of the content of educational programs of higher and postgraduate education taking into account global trends.
Implementation deadlines	2023-2027.
Sources of funding	• republican budget; • funds received from organizations, enterprises and institutions under contracts; • the University's own funds; • charitable contributions from sponsors, voluntary donations from legal entities and individuals, philanthropy.

2. Description of the prospects of the A. Burkitbayev Institute of Power Engineering and Mechanical Engineering of the Kazakh National Research Technical University named after K.I. Satpayev, taking into account the current state and long-term goals

The main objectives of the Institute are:

1. Ensure leadership in all aspects of its educational programs, offering relevant educational trajectories to students.

2. Provide students with high-quality, practice-oriented education and equip them with the knowledge and skills that will ensure their successful careers.

3. Establish close international ties in energy and mechanical engineering, and use educational programs and applied research in the interests of the industry of the Republic of Kazakhstan.

4. Promote the Institute's reputation as a leading provider of advanced technical education through partnerships with leading industrial enterprises in the Republic of Kazakhstan.

5. To develop a culture and environment of entrepreneurship at the Institute.

In 2023-2027, the Institute’s activities will be aimed at achieving the following objectives:

The main directions of this plan are:

1. Ensuring a high status for teachers, modernization of educational activities.

2. Providing a safe and comfortable learning environment.

3. Ensuring continuity and continuity of education and professional training in accordance with the needs of the economy.

4. Equipping departments with digital infrastructure and modern material and technical base.

3 Block of analytical and forecast substantiation of the Development Program

3.1 Analysis of the current state of the Institute of Power Engineering and Mechanical Engineering named after A. Burkitbaev for higher and (or) postgraduate education, key problems and their causes

To provide economic sectors with competitive personnel with postgraduate education, since 2019 the Institute has been admitting applicants to master's and doctoral programs with practical experience and those working in industry.

Attracting master's and doctoral students from production makes it possible to:

- organize practical seminars, trainings and forums on the production and maintenance of equipment and technologies in various industries;
- jointly develop and implement scientific and technical programs aimed at solving the problems of enterprises.

The Institute engages doctoral and master's students in the university's research projects to integrate them into larger theoretical and applied research programs and to validate the results of their dissertations. By 2027, the plan is to achieve 100% participation of doctoral students in funded research projects.

The main prerequisite for the creation of the Institute of Economics and Management is the President’s Address “The Third Modernization of Kazakhstan: Global Competitiveness” dated January 31, 2017.

The activities of the Institute of Economics and Management are aimed at conducting applied research and development in the following areas:Industry 4.0,Solving technological problems for businesses in collaboration with domestic universities and research institutes, as well as assisting enterprises in technology transfer.

The Institute's leading role is determined by the training of personnel in in-demand specialties.

The Institute trains specialists in educational programs

bachelor's degree

6B07101 Energy,
6B07122 Thermal power engineering,
6B07127 Ground Electric Vehicles and Charging Infrastructure,
6B07128 Digital Energy,
6B07105 Industrial Engineering,
6B07131 Design and technology in mechanical engineering,
6B07220 Machines and technologies for processing new materials,
6B07502 Standardization, certification and metrology,
6B07129 Nuclear energy,
6B07130 Engineering Mechanics and Modeling,
6B07107 Operational service engineering,
6B07115 Technological machines and equipment,
6B07132 Predictive technologies and machine diagnostics.
6B07501 Industrial Engineering

Master's degree

7M07228 Advanced materials processing technologies,
7M07502 Metrology (by industry),
7M07145 Engineering mechanics and equipment,
7M07136 Additive manufacturing,
7M07112 Digitalization of mechanical engineering production,
7M07113 Electrical engineering and power engineering,
7M07111 Digital engineering of machines and equipment.
7M07503 Quality management and diagnostic methods

doctoral studies

8D07112 Electric power industry,
8D07111 Digitalization of mechanical engineering production,
8D07113 Additive Manufacturing,
8D07209 Advanced materials processing technologies,
8D07110 Digital engineering of machines and equipment.
8D07108 Engineering metrology and standardization in mechanical engineering

The employment rate of which reaches 75%, which testifies to the quality of education at the institute.:

The institute's staff is working hard to transform itself into a rapidly developing regional innovative educational and scientific complex focused on automation and digitalization, achieve leadership in the country's higher education system, ensure the competitiveness of its graduates, and improve the quality of educational, scientific, and technical services to meet international standards.

Currently, educational activities at the institute6 departments carry out 14 bachelor's degree programs, 8 master's degree programs, and 6 doctoral degree programs.

The Institute has 28 licenses, including: 14 for undergraduate programs; 8 for master's programs; 6 for PhD programs.

The total number of students is 1,166. 1,004 are undergraduates, 76 are master's students, and 86 are doctoral students.

The minimum proportion of personnel training is carried outAccount of own funds of students, enterprises and companies Table 1.

Table 1 – Dynamics of the student body for all bachelor’s degree programs by funding sources

Name of the indicator	**Years**				
	2021	**2022**	**2023**	**2024**	**2025**
Total number of students, including:	400	286	704	920	1166
- students studying on state budget grants	352	263	644	812	1049
- students on a contractual basis	48	23	60	108	117
- students studying at the expense of enterprises and companies	-	-	-	-	

B In the three-stage training format, the maximum demand is for bachelor's degree programs, and the minimum demand is for doctoral degree programs.

B Table 2 shows the student contingent for the 2023/2024/2025 academic year for the educational programs of the institute’s departments:

No.	Department	Contingent		
		Bachelor's degree	Master's degree	Doctoral studies
1	Mechanical engineering	91/96/132	31/26/13	12/11/29
2	Energy	515/538/496	30/26/30	9/18/24
3	Technological machines and gas turbine units	108/119/138	10/21/13	10/21/27
4	Engineering mechanics	-/8/1	-/5/3	-/-/-
5	General Physics	-/6/46	-/-/-	-/-/-

6	Standardization, certification and metrology	144/169/133	4/10/15	-/-/4
	Astana branch Energy	-/-/11	-/-/-	-/-/-
	Astana branch Mechanical engineering	-/-/8	-/-/-	-/-/-
	Total	858/972/984	86/77/76	31/50/84

Table 3 shows a list of the Institute's accredited educational programs: 3 in the international agency ASIIN (Germany), 1 in NAOKO, 4 in NAAR, and 10 in KazSEE.

Table 3 - List of accredited educational programs

No.	Cipher	Specialty/OP	Certificate number and validity period	Link to the website
BACHELOR'S DEGREE				
1	6B07101	Energy	EUR-ACE June 23, 2023 September 30, 2028 ASIIN June 23, 2023 September 30, 2028	ASIIN
2	6B07115	Technological machines and equipment	NAAR AB 4381 06/10/2022 06/09/2027	NAAR
3	6B07105	Industrial engineering	KazSEE No. 2021 KE 0393 December 21, 2021 December 20, 2026	KazSEE
4	6B07502	Standardization, metrology and certification (by industry)	IAAR No.AB 4741 05/26/2023 - 05/25/2028	NAAR
5	6B07501	Industrial engineering	KazSEE No. 2021 KE 0394 12/20/2026	KazSEE
6	6B07220	Machines and technologies for processing new materials	KazSEE№23/18KA0152 December 20, 2026	KazSEE
7	6B07107	Operational and service engineering	ASIIN 06.24.2022 09.30.2027	ASIIN
	6B07106	Engineering mechanics	NAAR AB 4381 06/10/2022 06/09/2027	ASIIN
	6B07129	Nuclear energy	CAAAE 24/19KA0002 05/24/2024 05/23/2027	ASIIN
MASTER'S DEGREE				
1	7M07111	Digital engineering of machines and equipment	ASIIN 06.24.2022 09.30.2027	ASIIN
2	7M07228	Advanced materials processing technologies	KazSEE№23/18KA0153	KazSEE

			December 26, 2023 December 20, 2026	
3	7M07113	Electrical engineering and power engineering	KazSEE No. 1920 KE 0118 12/13/2019-12/12/2028	KazSEE
4	7M07112	Digitalization of mechanical engineering production	KazSEE No. 2021 KE 0396 12/21/2021 12/20/2026	KazSEE
5	7M07136	Additive manufacturing	KazSEE No. 2027 KE 0398 12/21/2021 12/20/2026	KazSEE
6	7M07502	Metrology (by industry)	NAAR AB 5223 05/31/2024 05/30/2029	
Doctoral studies				
1	8D07112	Electric power industry	NAOKO SA-A No. 0216/4 06/19/2026 06/18/2026	NAOKO
2	8D07110	Digital engineering of machines and equipment	SAAAE 25/24KA0089 04/11/2025 04/10/2030	NAAR
3	8D07209	Advanced materials processing technologies	KazSEE№23/18KA0154 December 26, 2023 December 20, 2026	KazSEE
4	8D07111	Digitalization of mechanical engineering production	KazSEE No. 2021 KE 0399 December 21, 2021 December 20, 2026	KazSEE
5	8D07113	Additive manufacturing	KazSEE No. 2021 KE 0401 December 21, 2021 December 20, 2026	KazSEE
6	8D07108	Engineering metrology and standardization in mechanical engineering	SAAAE 25/24KA0089 04/10/2030	KazSEE

Table 4. Atameken ranking of educational programs of Kazakhstan universities

Name of the OP	2023	2024	2025
5B07115 Technological machines and equipment	1st place	2nd place	2nd place

6B07502 Standardization, certification and metrology	2nd place	2nd place	10th place
6B07105 Industrial Engineering	5th place	1st place	1st place
6B07101 Energy	5th place	12th place	27th place

3.2 Evaluation of the team's innovative potential

The strategic directions of the Institute of Economics and Management are based on national and regional development priorities.

The Institute of Economics and Management is provided with highly qualified teaching staff and research workers.

The total number of full-time faculty is 123 people, of which 80% have PhDs, 6 Doctors of Science, 43 PhDs, 35 Candidates of Science, and 36 Masters of Science. The average age of full-time faculty is 46 years.

In the educational process, teachers use innovative teaching technologies that promote the development of students' analytical and critical thinking skills, as well as professional decision-making.

In recent years, more than 10 foreign professors have been invited to give lectures at the institute.

The Institute has sufficient potential to achieve its strategic goals.

The Institute regularly participates in research competitions in fundamental and applied sciences under the auspices of the Ministry of Education and Science of the Republic of Kazakhstan and other ministries.

Scientific and technical programs on automation, digitalization, and additive technologies are being developed with industrial enterprises of the Republic of Kazakhstan.

As part of the participation of the faculty and students in the research work, the Institute held the following events:

- 2nd year Master's students of the specialty "Digitalization of Mechanical Engineering Production" of the Department of Industrial Engineering as part of 2 teams KókJiek Teams (Tustykbaev Maksat, Gotman Yanna, Seyitқazy Nurgүl) with the project "Smart Stop" and Katrina (Azhay Askhat, Disenbekova Aliya, Ilyasov Eszhan) with the project "Wind Installation" participated in the competition "Student Energy Challenge - 2023", organized by the Association "KAZENERGY" and the company "Shell Kazakhstan" and reached the final.

A team of students majoring in "Electric Power Engineering" and "Thermal Power Engineering" from the Department of Power Engineering participated in the annual StudentEnergyChallenge intellectual team competition. Team "EvilGeniuses" presented their project on the topic of "The Impact of Climate Factors on the Efficiency of Photovoltaic Modules." Team members: third-year students K. Iglikov, D. Boyko, and G. Ilәlova; fourth-year students T. Baқtiyarov and N. Kalmen. Team Leader: E. Khidolda.

The "KPD100" team from the same department participated with a project titled "Development of a Thermal and Electrical Energy Generator Based on Solar Parabolic Concentrators." Team members: third-year students Belgibaykyzy T., Amanbaev A., Shylmagambetov R., Shagmanova M. Leader: Umyshev D.R.

We will also actively engage businesses in developing training programs and conducting master classes, as well as in joint research projects. These measures will establish close ties between the University and industry in the commercialization of our scientists' research.

3.3 Forecast of labor market trends in terms of personnel needs

*Employment of graduates*Due to the transition to a market economy, the labor market requires a qualitatively new type of specialist. The presence of international, joint, and national companies, as well as enterprises with modern foreign-made automated and computerized equipment, the number of which is constantly growing, in most cases requires young specialists.

Indicators of the quality of training of specialists at the Institute of Economics and Management are their demand in the labor market, career achievements, and a high level of competitiveness – the employment rate of graduates exceeds 70%.

The social partnership system is built on interaction with consumers; agreements for internships have been signed; an Alumni Association has been established; surveys of internship site managers are being conducted; and the content of educational programs is being updated to reflect employer requirements.

ERG, NAC Kazatomprom, JSC ArcelorMittal, LLP Kazminerals, JSC Aktyubrentgen, Almaty Transformer Plant; Kentau Transformer Plant; Almaty Heavy Engineering Plant (AZTM), Kirov Machine-Building Plant, JSC Almaty Fan Plant, MASHSVAR plant, LLP KGP Almatyelectrotrans, LLP STATUS PLAST, JSC Center for Earth, Metallurgy and Beneficiation Science, Research Center Parasat, JSC Volkovgeology, LLP Karachiginak, PO Alatau, JSC Electroshit, JV KazElektroprivod, Promashkomplekt Ekibastuz, JSC Akmola Repair Plant, LLP MFS, Zhanozen; LLP SAR avto South Kazakhstan region; ARMAN techno LLP, ALMA ELECTRIC LLP, NC KTZ JSC, Pacifica LLP, Kazakhtelecom JSC, ShalkiyaZinc JSCLTD", Intercom Engineering LLP, Bestizolation Plant LLP, Amadeo Central Asia LLP, Tien Shan Engineering LLP, Energy Almaty LTD LLP,TOO STK-COM, TOO Zhayykzharygy, Plant of pipeline fittings, JSC AlmatyEnergoService, plant Hoffman aluminum, JSC Kelet, Karaganda Foundry and Machine Plant, JSC NatsEKSand others.

4. Vision, mission, strategic goals and development objectives of the A. Burkitbayev Institute of Power Engineering and Mechanical Engineering of the K.I. Satpayev Kazakh National Research Technical University

Vision

The Institute's vision for strategic development is linked to the close integration of education, science, and industry, ensuring high-quality educational

and professional training for graduates and improving the system of higher and postgraduate education.

Fulfilling the Institute's vision requires its faculty, research and administrative staff, students, and graduate students to adhere to high standards of professionalism and universal moral values. In its educational, research, and outreach work, and in every management decision and action, the Institute consistently demonstrates its commitment to these principles and values.

The institute's educational activities are aimed at generating, accumulating, transmitting, and disseminating cutting-edge knowledge and new ideas. This will be achieved through the potential of established faculty and research groups, centers, and educational and research laboratories, which form the foundation of the educational process.

5. Mission

The creation of an innovative scientific and educational environment that supports the training and development of national personnel and facilitates the intensive professional development of personnel in priority technological areas of the Republic of Kazakhstan.

6. Strategic block of the Development Program

6.1 Place and role in the system of higher and postgraduate education in Kazakhstan

KazNITU is the only national research technical university and the flagship of technical education in Kazakhstan. Founded in 1934, KazNITU today plays a key role in the development of scientific and practical activities in the fields of energy and mechanical engineering in the Republic of Kazakhstan.

KazNITU became the base for supplying engineering personnel to the republic's industry and one of the main sources of scientific, government, and public figures in Kazakhstan. Its history is linked to the names of such renowned scientists and cultural figures as Ashir Burkitbayev, Kanysh Satpayev, Omirkhan Baikonurov, Akzhan al-Mashani, Ilyas Yesenberlin, Evney Buketov, Shakhmardan Yesenov, and the founders and members of the renowned ensemble "Dos-Mukasan."

Based on national and international rankings and taking into account its ongoing development, KazNITU ranks first among Kazakhstan's technical higher education institutions. Furthermore, it plays a role as a research university, closely collaborating with Kazakhstan's largest manufacturing enterprises in its scientific and technical research. Thus, a key priority in higher and postgraduate education is the trinity of education, science, and industry.

KazNITU must increase its efforts to address the challenges outlined in the Concept for the Development of Higher Education and Science. The following indicators from the Concept have been adapted to the university's capabilities and are presented in the comparative table below.

Globalization, regionalization, and internationalization as global trends in the development of higher education predetermine key processes such as the introduction of new educational technologies, among which information and telecommunications technologies are of paramount importance; and the deepening integration of education and science, which reflects the essence of university education and preserves its fundamental nature.

KazNITU's energy and mechanical engineering programs are undoubtedly a center of national and regional significance for Kazakhstan. The Energy and Mechanical Engineering program's development strategy includes the following indicators:

-training of personnel carried out according to educational programs in accordance with international standards, industry qualification frameworks, employer requirements, and in accordance with the atlas of new professions;

-multilingual education;

- involvement of foreign teaching staff in the educational process;

- development of the practice of academic mobility of students;

- increase in the number of scientific projects;

- development of R&D, issuance of technical specifications for design and production;

- digitalization of the educational process;

- attracting foreign students;

- increasing the publication activity of the teaching staff and students, increasing the scientometric indicators of the teaching staff, popularizing the scientific results of the teaching staff.

6.2 Academic Policy

KazNITU's academic strategy is aimed at implementing student-centered learning and improving the quality of education.

In its educational organization, KazNITU emphasizes active learning over passive learning. Emphasis is placed on critical and analytical study and understanding, and on increasing student responsibility and accountability. Conditions are created to ensure increased student autonomy, interdependence between instructors and students, and mutual respect in the student-instructor relationship.

All conditions have been created to increase the transparency of learning outcomes and processes.

The principle of the KazNITU educational process is academic integrity, the implementation of which is one of the main directions of the academic strategy.

Currently, all educational programs at KazNITU are being improved in accordance with a new educational model – a transition to a new educational technology that ensures the development of activities as opposed to the assimilation of a sum of knowledge.

The academic policy of the institute's departments is as follows:

- obtaining new knowledge through original research;

- compliance with academic ethics;

- the relevance of the developed educational programs and research topics, to increase the demand for graduates and employment;

- involvement of foreign partner universities to review the educational program;

- granting the status of “early researcher” to undergraduate students, students who are capable of making a key contribution to the generation of new knowledge within the framework of the university’s compliance with the research university model;

- achieving a “critical mass” to ensure innovation - this circumstance should contribute to the development of international, national and regional cooperation between higher education institutions;

- ensuring adequate funding for educational programs.

6.3 Development of innovative potential and its achievement

The Institute's innovative potential, reflecting the resource and performance components of a higher education institution's activities, is the basis for successful collaboration with enterprises in the real and financial sectors of the economy, as well as effective participation in government and international grants.

By 2027, the institute plansincrease the percentage of faculty members with degrees to 100%.

6.4 Commercialization of scientific and technical developments

Commercialization is the process of developing and implementing a series of activities through which the results of scientific research and development can be offered to markets for goods and services for commercial purposes.

Three applications were won in the GF competition for the most promising projects for the commercialization of the results of scientific and (or) scientific and technical activities (RNNTD) for 2022-2024 (Bekbaev A.B., Utebaev R.M., Sabirova L.B.)

Bekbaev A.B.:

2022-2024 Scientific Director of the project "Development and implementation of a pilot mini hydroelectric power station up to 200 kW of the siphon type."

The aim of the project is to develop and implement a pilot siphon-type mini hydroelectric power station with a capacity of up to 200 kW.

The project's objectives are the widespread implementation and installation of our mini-hydroelectric power station at existing water intake facilities in the Republic of Kazakhstan in partnership with the balance holders of water management facilities.

Implementation period: 2022-2024 (26 months)

Project team members: Project Manager - Amangeldy Bekbayev, Doctor of Engineering Sciences, Professor of the Higher Attestation Commission, Professor of the Department of Power Engineering at KazNITU named after K.I. Satpayev;

Commercialization Specialist - Saken Tuyebayev; Power Engineer - Evgeny Boldyrev; Accountant - Karlygash Aubakirova; Project Administrator - Damir Smatayev.

Utebaev R.M:

2022-2024 Scientific Director of the project "Serial production of charging stations for electric vehicles with improved characteristics"

The goal of the project is to produce a serial batch of 1,000 charging stations in accordance with the international standard IEC 61851-1, based on domestic technology.

The project's relevance lies in the production of a series of charging stations for electric vehicles with improved performance. Currently, approximately 4 million passenger cars are in operation in Kazakhstan. Experts predict that by 2030, one in four cars worldwide will be electric. Therefore, it is estimated that approximately 1 million electric vehicles will be on the road in Kazakhstan by 2030. Experience in countries where large numbers of electric vehicles are already in operation shows that one slow-charging station is needed for every five electric vehicles. Therefore, even according to the pessimistic projections, if Kazakhstan will have 200,000 electric vehicles in operation by 2030, such a fleet will require at least 40,000 charging stations.

Many electrical engineering companies worldwide develop and manufacture charging stations using their own technologies. Our company has developed and manufactures slow-charging charging stations using domestic technology. A distinctive feature of our stations is their adaptive charging algorithm, which prevents overloading power grids during peak hours and adapts charging current to grid conditions. As electric vehicle infrastructure develops in Kazakhstan, our products will be a worthy alternative to imported charging stations.

Implementation period: 2022-2024 (26 months)

Project team members: Project Manager - Ruslan Maratovich Utebaev, Commercialization Specialist - D.A. Nurpeisova, Researcher - E.A. Sarsenbaev, Design Engineer - M.B. Sansyzbaev, Software Engineer - N.A. Koltun.

Sabirova L.B.:

2022-2024 Scientific Director of the project "Development of a technology for the production of composite HPL boards from local low-value raw materials with the simultaneous creation of a finishing layer"

The aim of the project is to organize the production of composite materials in the form of HPL boards based on local low-value raw materials

The project's relevance lies in the trend in developed countries towards greater environmental friendliness, which means the ever-wider use of veneer, in particular, and wood materials in general.

While veneer consumption in developed markets is not decreasing, but increasing, the shortage and high cost of valuable wood species leads, on the one hand, to a reduction in veneer thickness, and on the other hand, to the widespread use of fast-growing species (poplar, aspen).

Poplar and aspen are used to produce so-called fine line technical veneer.

In our case, the veneer obtained from low-value wood species (poplar) will be additionally embossed to imitate more expensive wood species.

The project under consideration is so clearly superior to currently existing products that, over time, it could significantly replace conventional materials such as laminated chipboard.

The following factors allow us to confirm this:

The low cost of modified veneer. For example, the cost of 0.6 mm thick poplar or elm veneer impregnated with melamine is less than 300 tenge per square meter. This is lower than the cost of the cheapest facing material – Russian-made melamine paper.

Unconditional superiority in decorative properties over paper facings.

Clearly superior in performance (it resists scratches) over standard varnished veneer. Plus, it's significantly more cost-effective due to the elimination of the need for varnishing.

Implementation period: 2022-2024 (26 months)

Project team members: Project Manager – Leila Bakhtiyarovna Sabirova, Commercialization Specialist – M.I. Musrepova, Researcher – D.D. Baskanbaeva, Engineer – A.T. Nogaev,

In the GF competition for the most promising projects for the commercialization of the results of scientific and (or) scientific and technical activities (RNNTD) for 2023-2025, 1 application was won (Bortebaev S.A.).

The project "Modernization of sprinkler drives for irrigating agricultural crops using innovative resource-saving composite materials" is being implemented as part of the commercialization of the results of scientific and (or) scientific and technical activities for 2023-2025.

Project goal- creation of production of circular irrigation machines using innovative composite materials in the drive design.

*Relevance of the project.*In Kazakhstan, one of the main problems associated with agriculture is water scarcity. Limited and uneven rainfall distribution pose challenges to agricultural production. Problems with irrigation of crops arise, leading to reduced yields and limited opportunities for agricultural development. Water scarcity also impacts livestock farming and the ecological balance.

Irrigated agriculture is the main water consumer. Currently, the area of irrigated land in Kazakhstan is 1.6 million hectares. Over the next five years, work will continue to restore 600,000 hectares of irrigated land, bringing the area of irrigated land to 2.2 million hectares. Further, from 2025 to 2030, 800,000 hectares of new irrigated land will be brought into cultivation.

The use of sprinkler systems allows for the expansion of the agricultural sector and reduces food security risks. Increased crop and livestock production, achieved through the use of sprinkler systems, improves Kazakhstan's food self-sufficiency. Expanding the agricultural sector helps reduce dependence on food imports and strengthens the country's food sovereignty. This allows agricultural production in Kazakhstan to be efficient and predictable, thereby strengthening the country's food security.

Implementation period: 2023-2025 (26 months)

Project team members: Project Manager – Bortebaev Saiyn Abilkhanovich, Project Coordinator from Production – Sarsenov I.S., Commercialization Specialist – Itabaev A.A., Senior Researcher – Baskanbaeva D.D., Researcher – Elemesov K.K.

The Institute has submitted 26 applications for the GF competition for the most promising projects for the commercialization of the results of scientific and/or scientific and technical activities (RNNTD) for 2024-2026.

7. Ways to achieve the set goal

The Development Program's objectives are planned to be implemented through the creation of a hub that will enable the establishment of a center for training a new generation of personnel for Kazakhstan's industry.

The hub's operations and activities will be focused on several areas: academic, scientific, and social.

According to strategic objectives:

Strategic objective 1. "Quality composition of the university – By 2027, 10% of PhD students from the total number of students"

- The university's position in the QS WUR rankings has improved
- Increasing the position of the QS WUR university by subject Petroleum Engineering;
- Increasing the share of implemented post-doctoral programs;
- Increasing the number of educational programs within the framework of double-degree education with partner universities from the Top-700 of the QS ranking;
- Increasing the share of students studying within the framework of academic mobility, financed by the university from the total number of students;
- Increasing the proportion of teaching staff who have completed advanced training and internships abroad;
- Increasing the level of implementation of new qualification requirements (standards) for talent management; increasing human resources potential;
- Increasing the proportion of students engaged in volunteer activities from the total number of students studying in undergraduate programs;
- Increasing the share of attracted foreign scientists with a high h-index;
- Increasing the share of teaching staff teaching in English from the total number of teaching staff;
- Increasing the share of international educational programs implemented, academic exchanges with foreign partners.

Strategic Objective 2. "High-quality results of contract research – 300 scientific publications in Q1 and Q2 by 2027"

- Increasing the share of funded educational and research projects carried out at the university;

- Increase in publications in top-rated publications;
- Increasing the proportion of teaching staff who have international certificates confirming proficiency in a foreign language in accordance with the Common European Framework of Reference for Foreign Languages;
- Increasing the share of expenditure on the development of educational and scientific laboratories from the total budget of the university.

Strategic objective 3: "Quality education – By 2027, at least 10% of graduates receive a salary of 1,000,000 tenge."

- Increasing the proportion of graduates employed in the first year after completing their studies (out of the total number of graduates);
- Increasing the share of innovative OPs developed at the request of industry associations and enterprises;
- Increasing the share of those admitted to higher education institutions who have the Altyn Belgi badge, winners of international Olympiads and scientific project competitions of the last three years, winners of the presidential and republican Olympiads and scientific project competitions of the current academic year (awarded first, second and third degree diplomas) from their total number;
- Increasing the share of employers and business structures involved in the educational process.

Strategic objective 4. "High-quality scientific research – by 2027, the amount of contract research will be no less than 500,000,000.00 million tenge per year."

- Increasing the share of income received from scientific activities, innovative developments and commercialized projects (from the total budget of the university);
- Increasing the share of university teaching staff participating in educational and research projects from the total number of teaching staff;
- Increasing the share of grants from local authorities and employers;
- Increasing the share of projects financed by local authorities and business representatives;
- Increasing the proportion of young scientists who received a university grant for research activities;
- Increasing the share of young researchers attracted;
- Increasing the share of implemented international scientific projects from the total number of projects;
- Increasing the number of implemented virtual laboratories;
- Increasing the share of commercialized scientific developments from the total amount of applied scientific research funded from the budget
- Increasing the share of young scientists in the total number of scientists and
- researchers conducting R&D
- Increasing the share of modernized testing laboratories from the total number of testing laboratories to the 2023 level (2023 – 915)

High-quality corporate governance – By 2027, increase the level of satisfaction with the quality and condition of infrastructure, research, and the level of digitalization to at least 90%.

- Increasing the volume of investments attracted for the development of the university from the total income of the university;
- Increase in the number of electronic resources introduced into the educational process;
- Increasing the level of provision of conditions for students with special educational needs (curriculums, elevators, ramps, handrails, etc.);
- Increasing the proportion of students with special educational needs from their total number;
- Increasing the number of educational programs implemented using remote technologies;
- Increasing the share of foreign students in the higher education system from the total number of students;
- Increasing the share of information systems for identifying borrowing in order to implement the principles of academic integrity in universities (the existence of an agreement);
- Increasing the share of research conducted using a digital platform;
- Increasing the share of funds in the endowment fund from the total income of the university;
- Increasing the share of start-up projects implemented by employees studying at the university;
- Increasing the share of updated certified scientific equipment in state universities;
- Increasing the proportion of university administrators who have undergone advanced training in management;
- Gradually increasing the proportion of women in the executive body during competitions for vacant positions;
- A gradual increase in the proportion of women on the board of directors following the summary of the Board of Directors' activities by decision of the Sole Shareholder;
- Gradually increasing the proportion of female managers in structural divisions of organizations.

7.1 Academic activities

The academic activities of the Institute of Power Engineering and Mechanical Engineering are organized in accordance with the Development Plan of KazNRTU named after K.I. Satpayev for 2023-2027, and comply with the instructional and regulatory requirements for the organization of educational, methodological, research, and educational work.

To improve the training of specialists (bachelors), the institute continually studies employers' opinions on the quality of graduates' training, both through

anonymous surveys and through formal inquiries. An analysis of the official responses, as well as feedback from partner companies, suggests that employers have a positive opinion of the level of training for specialists and bachelors.

The content and quality of student training, the organization of the educational process, the system of current and midterm monitoring, and final certification comply with the requirements of the Academic Policy of KazNITU named after K.I. Satpayev.

The Institute of Power Engineering and Mechanical Engineering maintains close international ties with many foreign universities and organizations:

– Silesian University of Technology, Poland;
– Moscow Institute of Steel and Alloys, Russia;
– Magnitogorsk State Technical University named after G.I. Nosov, Russia;
– Ural State Agrarian University, Russia.
– Pennsylvania State University,
-National University of Singapore,
– National Tech Institute of Calicut
– Lublin University of Technology, Lublin, Poland;
– Czech Technical University in Prague, Czech Republic;
– University of Chemical Engineering and Metallurgy, Bulgaria, Sofia;
– University of RIEKI, Croatia;
– Georg Agricola University of Technology Bochum, Germany.

One of the priority areas for integrating Kazakhstan's higher education system into the international educational space is undoubtedly dual-degree education. To implement this program, the institute's departments are working to develop joint dual-degree educational programs.

The Department of IM does not offer double-degree programs.

The Department of Energy Engineering currently works closely with two European universities: HoF University of Applied Sciences and the Warsaw University of Technology, both of which are ranked in the top 500-600 according to QS. In 2023, Professor Désiré Rasolmopion from the Department of Energy at the Warsaw University of Technology visited the university. We are planning joint projects and a dual-degree program. Senior lecturer Zh.K. Bekbolatova from the Department of Energy Engineering was invited to HoF University to lecture for German students. Furthermore, master's students from the Institute of Energy and Management are planning an internship at HoF University in April of this year.

In the Department of Mechanical Engineering, since autumn 2023, two doctoral students from the program “8D07113 Additive Manufacturing” of the department have been undergoing a scientific internship at the Technical University of Rijeka (Croatia): Kalmaganbetov Sanzhar and Ibrahim Alibek.

Regarding the Department of "CSiM", negotiations are being held with the Azerbaijan State University of Oil and Industry and the Turkish GEBZE TECHNICAL UNIVERSITY.

Regarding the Department of Technological Machines, Transport and Logistics - In the 2023-2024 academic year, in order to implement the double-degree

education program, the Department of Technological Machines, Transport and Logistics, on behalf of the university, concluded Agreement No. 30/1 dated 02/26/2021 for the double-degree education program in the OP - 7M07111- "Digital Engineering of Machines and Equipment" with the Silesian University of Technology (Katowice, Poland).

In the 2023-2024 academic year, work was carried out to develop a joint educational program with the Silesian University of Technology (Katowice, Poland).

Benefits of the double degree program:

- international experience;
- employment prospects after graduation;
- acquisition of progressive knowledge from leading teachers of partner universities;
- obtaining 2 diplomas from KazNITU + a partner university.

In the 2023-2024 academic year, the department carried out work on the implementation of a joint educational program with universities in Europe, Turkey, China and the CIS.

To implement the Institute's Development Program for 2023-2027, students are encouraged to participate in Olympiads, competitions, and contests at various levels. This helps identify talented students in various fields of science and sports, and enhance their cognitive and practical activities and creative potential.

On May 29, 2025, a double-degree educational program 1+1 for a master's degree in OP 7M07112 "Digitalization of Mechanical Engineering Production" was developed with the Tashkent State Technical University named after I. Karimov, Tashkent, Uzbekistan.

A double-degree educational program 1+1 master's degree in OP 7M07503 "Quality Management and Methods, Diagnostic Systems (by Industry)" is being implemented with the Azerbaijan State University of Oil and Industry, Baku, Azerbaijan.

On May 29, 2025, a double-degree educational program 1+1 master's degree in OP 7M07502 "Metrology (by industry)" was developed with TSTU named after I. Karimov, Tashkent, Uzbekistan.

On November 13, 2023, the Department of General Physics signed a memorandum of cooperation with the Institut Polytechnique de Grenoble (France). The agreement provides for the implementation of a dual-degree program and student exchange programs.

Table 5 – External and internal academic mobility of students

No.	Full name	OP, course	Country, partner university	Duration of training	Contact information
1	Baidauletov Arslan	6B07107 – Operational and	Poland	2022-2023	

		service engineering			
2	Zhanbyr Aidos Galymzhanuly	6B07101 - Energy	Silesian University of Technology	from September 1, 2021 to February 25, 2022	87072101446
3	Akzamova Asem Melskyzy	6B07101 - Energy	Silesian University of Technology	from September 1, 2021 to February 25, 2022	87474238559
4	Bashanova Amina	6B07129 - Nuclear energy	France University of Greenoble	From 01.09.2025 – 12.12.2025	877738650000
5	Turakbai Alikhman	6B07129 - Nuclear energy	Poland. Silesion University of Technology	01.09.2025 – 12.02.2025	87711672524
6	Zhuldyz Aisulu Bauyrzhankyzy	6B07502 – Standardization, certification and metrology	Malaysia. INTI International University	11.08.2025 - 14.12.2025	87074870975
7	Shaykhmeddenova Aina Rafailievna	6B07502 – Standardization, certification and metrology	Malaysia. INTI International University	11.08.2025 - 14.12.2025	87074870975
8	Tleubergenov Bakytkeldy Ermekovich	6B07131 – Design and Technology in Mechanical Engineering, 2nd year	Ulm College of Applied Sciences (Ulm, Germany)	September 23, 2024 - March 14, 2025	+7 7024588560
9	Grigoriev Egor Olegovich	6B07131 – Design and Technology in Mechanical Engineering, 2nd year	University of Hof (Hof, Germany)	September 23, 2024 - March 14, 2025	+7 7775955580
10	Қанатұлы Асан	6B07105 Industrial Engineering, 3rd year	Islam Karimov University (Tashkent, Uzbekistan)	September 1, 2024– December 31, 2024	+7 7074017104
11	Kaben Toktarkhan Abdalyuly	6B07105 Industrial Engineering, 3rd year	Islam Karimov University (Tashkent, Uzbekistan)	September 1, 2024– December 31, 2024	+7 7072730843

12	Muratbek Dias Armanuly	6B07105 Industrial Engineering, 3rd year	Islam Karimov University (Tashkent, Uzbekistan)	September 1, 2024– December 31, 2024	+7 7479894300
13	Kasymkhanuly Ansar Kasymkhanuly	6B07105 Industrial Engineering, 3rd year	Islam Karimov University (Tashkent, Uzbekistan)	September 1, 2024– December 31, 2024	+7 7756494831
14	Tabigat Akhtilek	6B07105 Industrial Engineering, 3rd year	Islam Karimov University (Tashkent, Uzbekistan)	September 1, 2024– December 31, 2024	+7 7066179556
15	Zharasbaeva Sofia Nurkenovna	6B07105 Industrial Engineering, 3rd year	Islam Karimov University (Tashkent, Uzbekistan)	September 1, 2024– December 31, 2024	+7 7006189682
16	Oralkhan Azamat Bakytbekuly	6B07131 Design and technology in mechanical engineering	Islam Karimov University (Tashkent, Uzbekistan)	02.02. – 07.06.2025	+7707444547 8
17	Toktibaev Seitzhan Kahramon ugli	6B07131 Design and technology in mechanical engineering	Islam Karimov University (Tashkent, Uzbekistan)	02.02. – 07.06.2025	+7778784152 1
18	Zhatkanbai Bazhan Saken	6B07131 Design and technology in mechanical engineering	Islam Karimov University (Tashkent, Uzbekistan)	02.02. – 07.06.2025	+7776630200 6
19	Kenestaev Bakdaulet Kuatuly	6B07131 Design and technology in mechanical engineering	Islam Karimov University (Tashkent, Uzbekistan)	02.02. – 07.06.2025	+7747389910 0
20	Kydyrali Birlik Yerzhanuly	6B07131 Design and technology in mechanical engineering	Islam Karimov University (Tashkent, Uzbekistan)	02.02. – 07.06.2025	+7747235335 4
21	Zhanserik Nureken Dauletuly	6B07105 Industrial Engineering	Sapienza University, Department of Mechanical and Aerospace	01.02. – 31.07.2025	+7700231562 4

			Engineering (Rome, Italy)		
22	Arepyev Artur Alexandrovich	6B07105 Industrial Engineering	Lublin University of Technology (Lublin, Republic of Poland)	18.02.2025 - 30.06.2025	+7 708 9668573
23	Dergunov Dmitry Viktorovich	6B07115 - Technological machines and equipment; 2nd year	Azerbaijan University of Architecture and Constructio n	from February 16 to June 16, 2025	7 708 729 4500
24	Kazhimuratova Zhadra Maratovna	6B07115 - Technological machines and equipment; 3rd year	Azerbaijan University of Architecture and Constructio n	from February 16 to June 16, 2025	7 707 732 8015
25	Irmekbaev Dias Serikovich	6B07115 - Technological machines and equipment; 3rd year	Azerbaijan University of Architecture and Constructio n	from February 16 to June 16, 2025	7 705 638 6884
26	Zhasbolat Aibyn Muratuly	6B07115 - "Technological Machines and Equipment"; 2nd year	Tashkent State Technical University named after Islam Karimov, Uzbekistan	students enrolled in the academic mobility program for the 2024-2025 academic year (fall semester)	87718444058
27	Dzhumamukhambetov a Inkar Nurdauletovna	6B07115 - "Technological Machines and Equipment"; 2nd year	Tashkent State Technical University named after Islam Karimov, Uzbekistan	students enrolled in the academic mobility program for the 2024-2025 academic year (fall	87015046630

				semester)	
28	Akbalaev Zhanibek Nurlanovich	6B07115 - "Technological machines and equipment"; 2nd year;	Tashkent State Technical University named after Islam Karimov, Uzbekistan	students enrolled in the academic mobility program for the 2024-2025 academic year (fall semester)	77073275000
29	Tynyshtyk Yerasyl	6B07115 - "Technological Machines and Equipment"; 3rd year	Ulm University of Applied Sciences; 3rd year; Germany	students enrolled in the academic mobility program for the 2024-2025 academic year (fall semester)	77072041288
	Zhanserik Nureken Dauletuly	6B07105 Industrial Engineering	Sapienza University, Department of Mechanical and Aerospace Engineering (Rome, Italy)	01.02. – 31.07.2025	+7700231562 4
	Arepyev Artur Alexandrovich	6B07105 Industrial Engineering	Lublin University of Technology (Lublin, Republic of Poland)	18.02.2025 - 30.06.2025	+7 708 9668573

Table 6 - Foreign teachers invited to participate in the educational process of KazNITU (including online lectures)

No.	Full name of the foreign teacher	Position, academic degree	Country, name of partner university	Teaching disciplines, number of hours	Contact information of the foreign teacher (e-mail, telephone)

1	Martyushev Nikita Vladimirovich	Candidate of Technical Sciences, Associate Professor	Russia, Tomsk, Tomsk National Research Polytechnic University	Modern Materials – 72 Hours	Tomsk, Sovetskaya st. 107.3 8 (3822) 60-62-85, +7 906 956 4322, martjushev@tpu.ru
2	Karaivanov Dimitar Petkov	Associate Professor, Doctor PhD	University of Chemical Technology and Metallurgy, Sofia, Bulgaria	Mechanical engineering and machine parts	Sofia, Bulgaria, jk Gotse Delchev, Metlichina poliana St., bl. 38, v. A,ap. 19 +359 887596231, dipekabg@yahoo.com
3	Baydullaev Azamat Absatarovich	Senior Lecturer	Uzbekistan, Tashkent State Technical University, Faculty of Mechanical Engineering	Calculation and design of cutting tools (150 hours)	Mobile phone +998 97 762 17 19

Table 7 - KazNITU faculty invited to participate in the educational process of partner universities (including online lectures)

No.	Full name of the faculty of KazNITU	Position, academic degree	Country, name of partner university	Teaching disciplines, number of hours	Coordinates of the KazNITU faculty (e-mail, telephone)
1	Bekbolatova Zhannat Kairovna	Senior Lecturer, M.Sc. (Eng.)	Poland, Bialystok University of Technology	Renewable energy sources, 4 hours	zh.bekbolatova@satbayev.university
2	Kerimzhanova Manshuk Fazylovna	Professor of the Department of Mechanical Engineering	Uzbekistan, Tashkent, TSTU named after I. Karimov	Additive Manufacturing (2 hours)	+77471558283

7.2 Scientific activity

Description of the Institute's prospects in science.

The development of the scientific and innovative environment and the activities of the Institute will be carried out in the following areas:

– mastering the fundamentals of research and innovation activities by master's and doctoral students;

– active involvement of master's and doctoral students in R&D;

– active involvement of teaching staff in research and innovation activities;

– transforming the institute into a center for communication between business, society, and the state on issues of scientific and technological forecasting and the exchange of advanced knowledge;

– development of close cooperation with the real sector of the economy both in search of orders for applied developments and in search of fundamental topics;

– formation of innovative production and organization of innovative enterprises combining the scientific potential of the institute and the capabilities of large enterprises and firms;

– internationalization of scientific activity, expressed in connection with the advanced scientific agenda, publications in international journals, the organization of international research teams, etc.;

– development and strengthening of the material and technical base for scientific research.

- intensification of the activities of the institute's teaching staff in publishing scientific articles in highly rated journals Q1, Q2 and Q3.

– Monitoring the citation rate of the department's faculty's works in domestic and international publications, summarizing the results obtained, and identifying trends for each individual employee.

Analysis of the state of activity, key problems and their causes in science.

The Institute carries out applied, exploratory (initiative) research and development work.

As of the end of 2023, up to 40% of the teaching staff is involved in the implementation of research and development projects for their commercialization, in accordance with Table 5.

Demand for research servicesuniversity, research projects, take place on the part of:

- states;
- private enterprises, firms, companies;
- international organizations.

Table 8 – Dynamics of the level of participation of the faculty in the implementation of funded R&D and commercialization

Name of the indicator	Years				
	2023	2024	2025	2026	2027
The share of teaching staff participating in the implementation of funded research projects and commercialization, %	40	45	50	60	70

The maximum demand for scientific research services and scientific projects, according to Table 9, in terms of the number of contracts concluded, comes from the state.

Table 9 – Dynamics of the number of contracts concluded for the implementation of research projects

quantity of units

Name of the indicator	Years				
	2023	2024	2025	2026	2027
Total number of contracts, including:	27	40	46	52	58
- agreements for the implementation of projects using state budget funds	16	26	30	35	40
- contracts for the implementation of projects at the expense of private enterprises, firms, and companies	11	14	16	17	18
- agreements for the implementation of projects using funds from international grants and foundations	0	0	0	0	0

According to Table 10, the volume of demand for science in terms of funding from the state prevails over the income from science received from enterprises and private business.

Table 10 – Dynamics of the volume of funding for research projects

Competitions	2023	2024	2025	Submitted
PCF	1,224,359,414.00	546,000,000.00	450,000,000.00	1
Commercialization	350,000,000.00	666,093,100.76	350,000,000.00	15
GF	670 576 603.00	604,356,538.75	718 143 209.00	15
ЖГ	47,998,762.98	148,910,551.00	120,000,000.00	5
Cabinet of Ministers of Ukraine	150,000,000.00	-	180,000,000.00	5
HD	131,140,000.00	113,500,000.00	54,400,000.00	

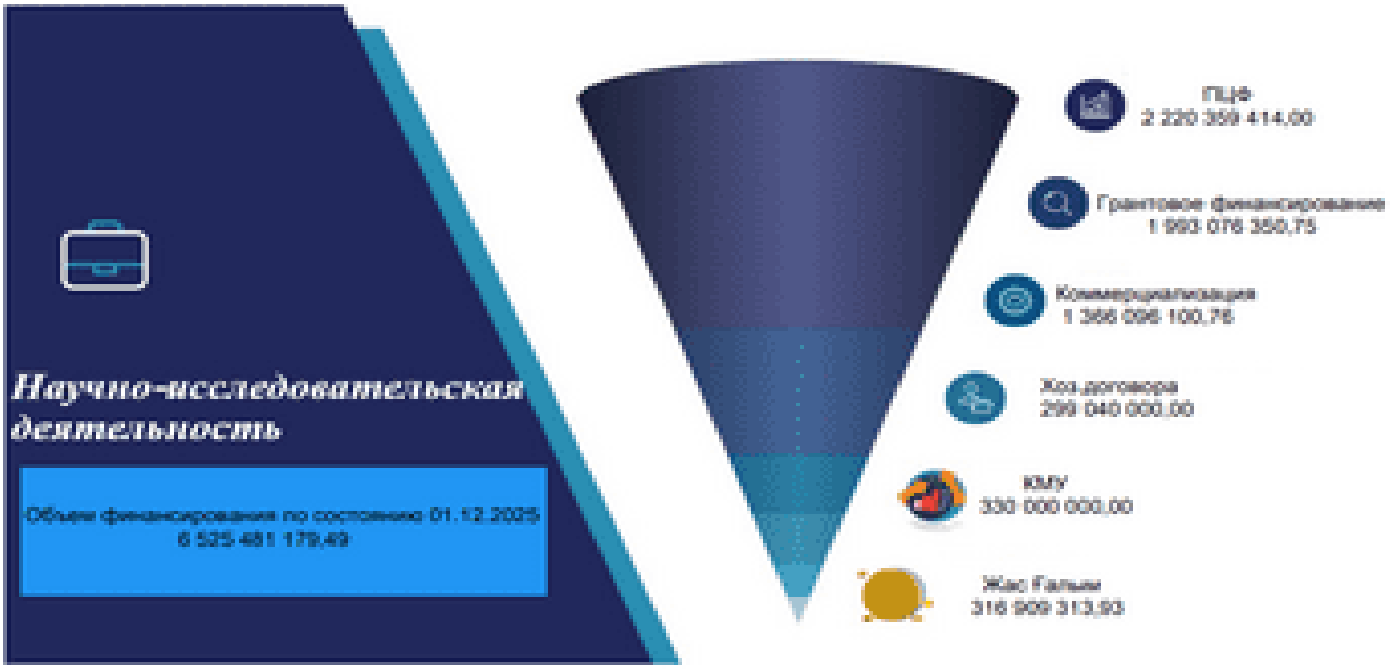


Table 11 – Publication activity

Department	Q1 (2023/2024/2025)	Q2 (2023/2024/2025)	Q3 – Q4 (2023/2024/2025)	KKSON	PATENT	MONOGRAPH	Plan for 2025-2026 Q1/Q2/Q3-Q4/ KKSON/ PATENT/ MONOGRAPH
General Physics	-/2/1	3/3/4	5/4/35	6/5/41	1/-/4	-/1/1	11/5/15/8/15/3
SSiM	0/1/4	0/3/6	2/3/4	3/6/7	0/0/0	1/2/5	5/8/4/8/1/5
Mechanical engineering	2/0/1	0/1/3	4/3/4	8/6/7	2/0/0	1/2/1	1/1/2/3/1/1
TMiO	-/-/-	1/4/10	5/3/12	8/5/31	1/3/5	-/-/-	1/4/12/3/2/2
Energy	2/0/1	0/1/3	2/3/4	8/6/7	2/0/-	1/2/1	1/1/2/3/1/1
THEM	5/4/9	1/1/3	2/2/6	2/2/6	0/0/0	0/0/0	2/2/4/4/0/0
TOTAL	1/6/10	6/8/17	14/10/11	18/26/31	2/6/3	0/2/4	6/9/15/24/4/6

Along with funding for science, the qualitative aspects of the results of a university's research activities include:

- obtaining patents and their commercialization;
- publications in top-rated national and international publications.

In accordance with Table 12, the institute's scientists receive patents for inventions annually.

Table 12 – Dynamics of received patents for inventions and the trend of their commercialization

quantity of units

Name of the indicator	Years				
	2023	2024	2025	2026	2027
Number of patents received for inventions, including:	3	5	7	8	9
- number of commercialized patents	0	2	3	4	5

Table 13 – Dynamics of publication activity of the teaching staff

Number of units

Name of the indicator	Years				
	2023	2024	2025	2026	2027
Number of publications in journals recommended by the Committee for Control of Consumer Rights Protection and Human Wellbeing (KKSON)	41	45	50	55	60

The institute has a significant research infrastructure to support research projects and R&D efforts. The institute boasts 30 specialized laboratories and classrooms equipped with the necessary equipment and instruments, computers, and software. Students utilize the latest internationally recognized computer-aided design systems, such as ADEM, SolidWorks, AutoDesk, Kompas 3D, MSC Nastran, Comsol Multiphysics, and APM WinMachine. They also study industrial technologies and equipment based on computer and 3D scanning technologies, as well as the conversion of results into 3D drawings and their production on 3D printers.

Table 14 – Dynamics of the number of laboratories

Number of units

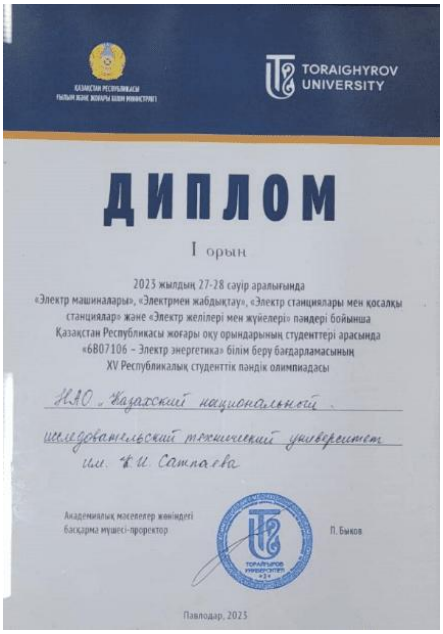
Name of the indicator	Years				
	2023	2024	2025	2026	2027
Total number of laboratories	30	30	31	32	33
Number of laboratories for R&D	2	2	2	2	2

7.3 Social activities

On March 15, 2023, a regional professional skills competition was held at the K. I. Satpayev Kazakh National Research Technical University among teachers of technical, vocational, and postsecondary education institutions in the energy sector. The competition aimed to identify and support talented and creative teachers in technical and vocational education institutions and improve their teaching skills. Twenty-two engineer-teachers specializing in energy from Talgar Agribusiness and

Management, Talgar Polytechnic, Saryzhaz Vocational and Technical College, Bakana Agro-Industrial College, Uzynagash Vocational College, Shelek Polytechnic, Kaskelen Vocational and Technical College, Karakemer Vocational College, and Issyk Vocational and Technical College participated in the competition and tested their skills individually and in groups across three modules of professional skills. In accordance with the competition regulations, the participants' work was evaluated using the CIS system by a panel of scientists and experts from the K. I. Satpayev Kazakh National Research Technical University. Based on the results of the competition, the winners were awarded first, second, and third-degree diplomas from the regional educational and methodological center for education development, as well as participation certificates. The first-place winners received a ticket to the national stage, which will be held in December in the North Kazakhstan region.

From April 27 to 28, 2024, the 15th Republican Student Subject Olympiad in the educational program "6B07106 – Electric Power Engineering" was held at Toraigyrov University among students of higher educational institutions of the Republic of Kazakhstan in the disciplines "Electrical Machines," "Power Supply," "Electric Plants and Substations," and "Electrical Networks and Systems." Third- and fourth-year students from the Power Engineering Department of the Institute of Power Engineering and Mechanical Engineering took first place among nine universities in the country: Fariza Askhatovna Gabyl-Manapova (first place), Daulet Talgatovich Kaldybayev (second place), and Ansat Abenovich Aben (third place). Our team leader, Rakhimash Shanrakbayevna Abitaeva, senior lecturer in the Power Engineering Department, was awarded a letter of thanks.



From June 12 to 23, 2024, a number of faculty members from the Power Engineering Department of the Institute of Power Engineering and Mechanical Engineering of KazNRTU named after K. I. Satpayev completed advanced training courses at the Almaty University of Power Engineering and Telecommunications named after Gumarbek Daukeyev. The course was held in two areas: electric power industry specialists – E. A. Sarsenbayev, E. Khidolda, A. O. Berdibekov, R. Sh. Abitaeva, and K. B. Shakenov – on the topic: "Interregional and Distribution Electric Grid Modes"; and heat power engineers – N. E. Balgayev, K. A. Bayanbayev, A. A. Zhumatova, and A. S. Nygymanova – on the topic: "Operation of Thermal Power Plant Boiler Equipment." The course consisted of 72 hours of training in all sections of theoretical and practical classes, and they successfully passed the qualifying tests. Upon completion of the course, a certificate was issued.

First-year students of the "SSiM (by industry)" program, Abyzbek Anelya and Abdykapparova Aruzhan, took 2nd and 3rd places in the IV Republican and International Subject Olympiad in "Descriptive Geometry".

ЕУРАЗИЯ ҰЛТТЫҚ УНИВЕРСИТЕТІ

ҚАЗАҚСТАН РЕСПУБЛИКАСЫ ҒЫЛЫМ ЖӘНЕ ЖОҒАРЫ БІЛІМ МИНИСТРЛІГІ
Л.Н. ГУМИЛЕВ АТЫНДАҒЫ ЕУРАЗИЯ ҰЛТТЫҚ УНИВЕРСИТЕТІ

ДИПЛОМ

II ДӘРЕЖЕЛІ

2023 жылдың 21 сәуірінде
«Сызба геометрия» пәнінен өткен
IV Республикалық және Халықаралық студенттік пәндік олимпиадасында
2-орын иеленгені үшін

Абызбек Анеля
(жетекшілері - Каражанова Д.Д., Шингисова Р.К.)

МАРАПАТТАЛАДЫ

Басқарма төрағасы-Ректор
Е. Сыдықов

№ 01-2980
«28» 04 2023 ж.
Астана қаласы

ЕУРАЗИЯ ҰЛТТЫҚ УНИВЕРСИТЕТІ

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Л.Н. ГУМИЛЕВ АТЫНДАҒЫ ЕУРАЗИЯ ҰЛТТЫҚ УНИВЕРСИТЕТІ

ДИПЛОМ

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3-орын иеленгені үшін

Абдықаппарова Аружан
(жетекшілері - Каражанова Д.Д., Шингисова Р.К.)

МАРАПАТТАЛАДЫ

Басқарма төрағасы-Ректор
Е. Сыдықов

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Астана қаласы

Students 2 students of the OP 6B07105 "Industrial Engineering" were awarded with the certificates "Activist of KazStandard Academy" (Saken G. - 1st year, Sharatbekova A. - 2nd year)

First-year students of the "SSiM (by industry)" program received a certificate and a statuette for the best video "I am a student of KazStandard Academy"»

In the 2023-2024 academic year, elements of the dual education system were introduced at the Almaty Heavy Engineering Plant JSC.

Practical classes in 6 disciplines were held at the enterprise, the classes were conducted by experienced specialists (Chief Mechanic, Head of Quality Service) of the plant.

Starting in the 2023-2024 academic year, the department plans to implement a pilot project, "One-Year Student Internship in Manufacturing." Fourth-year students will be sent to manufacturing facilities for paid internships at the beginning of the academic year, combining work and study for the remainder of the year. All classes will be online, and thesis writing and defense will also take place at the facility. After completing the internship, students can choose to remain at the facility or transfer to another position. Successful internships will provide students with practical skills, help them find employment, and add a valuable asset to their resume.

A foreign scientist, Dimitar Petkov Karaivanov, Associate Professor, Candidate of Technical Sciences, University of Chemical Technology and Metallurgy, Sofia, Bulgaria, was invited in December 2023 to give lectures and conduct a master class for teachers and students of the Department of Mechanical Engineering.

In the fall semester of the 2023-2024 academic year, two doctoral students from the department's program "8D07113 Additive Manufacturing" are undergoing a research internship at the Technical University of Rijeka (Croatia): Kalmaganbetov Sanzhar and Ibrahim Alibek.

Within the framework of the memorandum of mutual cooperation No. 001649POS dated November 14, 2022, with the aim of developing cooperation in the field of science and research in the mechanical engineering industry, Director

of the Institute of Power Engineering and Mechanical Engineering K.K. Yelemesov and Head of the Department of Mechanical Engineering E.Z. Nugman completed an industrial internship from 01.02.2023 to 28.02.2023 at SaryarkaAvtoProm LLP, Kostanay.

Master class from Beam.kz "A Strong Resume, or How to Get Your Dream Job (Internships, Part-time, Volunteering, Full-time 2nd, 3rd, 4th years)", an event dedicated to Mechanical Engineer's Day (friendly football matches for students and teachers of the Mechanical Engineering Department and the Almaty College of Passenger Transport and Technology)

Students and doctoral students from the department participated in the Shell Eco-Marathon Asia 2022 competition, which took place in Indonesia from October 11th to 15th on the island of Lombok, home to the Pertamina Mandalika International Street Circuit MotoGP. This annual competition for innovation in energy-efficient transportation challenges university students to create eco-friendly cars. The competition has been held since 1939. The team's car is made entirely of carbon and is powered by electricity. The marathon judges praised the car as one of the most technologically advanced. They were the first team to reassemble a disassembled car. This was the third time the SU Racing Team participated in this competition.

The department held a "Best 3D Designer" competition among University students. Students from the Mechanical Engineering Department showcased their talents and skills in 3D modeling. In the "Best 3D Designer" competition, they demonstrated their skills and demonstrated that a creative approach can lead to success.https://fb.watch/jPRO2fvT8J/?mibextid=qC1gEa.

Winners with prize places.

1st place: Akana Alikhana

2nd place: Karay Erasyla

3rd place: Nikolay Shevchenko

The first stage—the qualifying round for the national student research paper competition—was held. The first- and second-place papers were recommended for submission to the second stage of the competition.

The teaching staff conducts career guidance work in comprehensive schools in the city of Almaty and the Almaty region.

Third and fourth year students conducted career guidance work in the schools where they studied




In February 2023, the departments' teachers conducted career guidance work in comprehensive schools No. 94, No. 138, No. 26, No. 204, No. 196 in Almaty, Chelik village, Almaty region.

In 2023-2024, two doctoral students, Bazarbay B.B. and Aibilezova G.S., successfully passed their preliminary defense in the PHD doctoral program.

By the decision of the Council of Rectors and the Academic Council of the NAO "KazNITU named after Satpayev", Associate Professor G.A. Smailova was awarded the Satbayev University Gold Medal for her special contribution to the development of the university.

Anton Pak, a first-year student in the 6B07131 "Design and Technology in Mechanical Engineering" program at the Department of Mechanical Engineering at the Institute of Power Engineering and Mechanical Engineering, won silver at the international taekwondo tournament in Karaganda. The competition is dedicated to the memory of the soldiers of the Afghan War.

In 2025, as part of the KazStandard Academy, eight fourth-year students of the OP 6B07205 "Standardization, Certification and Metrology" of the Department of Standardization and Metrology completed advanced training courses at the RSE "KazStandard" on the topic: "Verification and Calibration of Electrical Measuring Instruments" free of charge.

In honor of Mechanical Engineers' Day on September 26, 2025, the Department of Mechanical Engineering organized a "Best 3D Designer" competition among college and university students, as well as a mini-football tournament among students of the Institute of Power Engineering and Mechanical Engineering. The Department of Mechanical Engineering at K.I. Satpayev Kazakh National Research Technical University awarded a third-place diploma to the mechanical engineering team that participated in the friendly mini-football match.

On October 31, 2024, the Military Department held an Open Day, attended by 100% of first-year students. All students completed the "Artificial Intelligence for All" program offered by KazNTU, lasting approximately 7 academic hours, and received a certificate. On April 25, 2025, a lecture was held, organized by OTC Network and as part of the "Job Fair." Students attended the event, familiarized themselves with the information, and listened to the lecture. On May 6, 2025, students took part in a concert dedicated to Defender of the Fatherland Day (May 7) and Victory Day (May 9) as spectators. On May 8, 2025, students took part in a cleanup day held in the Almalinsky District with the participation of the city akim.

Also, students Oralkhan Azamat took 1st place in the University Olympiad in English (Satbayev University) and received a certificate, Marasanova Darya took 2nd place (200m, backstroke and 200m, throw) and 3rd place (400m, k/pl and 4x100m, v/s) in the Summer Championship of the Republic of Kazakhstan in swimming and Izmuhanbet Aidyn Məlikұly took 2nd place in the Republican tournament қazaқsha kures, 66 kg - 2nd place, which was held from 5-7 January 2025, in the city of Kyzylorda

8. Description of the expected results of the implementation of the Development Program

Description of expected results in improving the quality of education

- compliance of the personnel policy in relation to the teaching staff with the national qualification requirements (Ministry of Education and Science of the Republic of Kazakhstan) (Order of the Ministry of Education and Science of the Republic of Kazakhstan dated November 16, 2018 No. 634) and international standards.
- compliance with the teaching staff workload standards based on 6 full credits per 1 discipline;
- involvement of production specialists in lectures;
- transparent budgeting of departments, availability of the department’s own

budget;

- financing of the material base and research infrastructure.
- application of modern pedagogical teaching methods and innovations.
- invitation and funding of highly qualified specialists from leading domestic and foreign educational organizations, annual involvement of at least 1 professor for the educational program;
- annual advanced training of teaching staff in the amount of at least 72 hours.

Description of expected results in post-university innovative education

- compliance of the content of the dissertation work of a master's and doctoral student with the legislation of the Republic of Kazakhstan and international requirements;
- compliance with the requirements of the State Educational Standard of the Republic of Kazakhstan for the research work of a master's student and a PhD student;
- compliance with the practical orientation of the educational program and research work of doctoral and master's students;
- interdisciplinary approach in the educational program, the presence of at least 40% of interdisciplinary disciplines in the curricula.
- PhD students must possess skills such as academic writing, public speaking, and research methodology; the ability to work with big data, develop networking, manage projects, develop grant applications, work in group and team projects, and possess public presentation skills, among others.
- participation of 100% of doctoral students in group research projects for production and grant funding;
- checking of any scientific works using the Antiplagiat program.

Appendix 1
to the Development Program
non-profit joint-stock company
society "Kazakh National
research technical
K.I. Satpayev University
for 2023–2027

Target indicators of the Development Program of the A. Burkitbaev Institute of Power Engineering and Mechanical Engineering for 2023–2027

Item No.	Target Indicators	Unit of measurement	In the planning period				
			2023	2024	2025	2026	2027
1	2	3	4	5	6	7	8
Task 1. Integration of scientific activity and the educational process at all levels of higher and postgraduate education							
1.	The share of innovative OPs developed at the request of industry associations and enterprises	%	1	1	2	1	1
	Department of Standardization, Certification and Metrology	Quantity	0	0	0	0	0
	Department of Mechanical Engineering	Quantity	0	0	0	0	0
	Department of Energy	Quantity	1	1	1	1	1
	Department of General Physics	Quantity	0	0	0	0	0
	Department of Engineering Mechanics	Quantity	0	0	0	0	0
	Department of Technological Machines and Equipment	Quantity	0	0	1	0	0
2.	The share of invited foreign scientists and teachers from the total number of teachers at the institute	%	0	2	0	3	3
	Department of "Standardization, certification and metrology"	Quantity	0	0	0	1	1
	Department of Mechanical Engineering	Quantity	0	0	0	1	0
	Department of Energy	Quantity	0	1	1	1	0
	Department of General Physics	Quantity	0	0	0	0	1
	Department of Engineering Mechanics	Quantity	0	1	0	1	0

	Department of Technological Machines and Equipment	Quantity	0	0	0	0	1
Task 2. Preparing the next generation of leaders – 10% of PhD students from the total number of students							
3.	Number of double degree programs with foreign universities	units	0	1	1	4	3
	Department of "Standardization, certification and metrology"	units	0	0	1	1	1
	Department of Mechanical Engineering	units	0	1	1	0	0
	Department of Energy	units	0	0	1	1	0
	Department of General Physics	units	0	0	1	0	1
	Department of Engineering Mechanics	units	0	0	0	1	1
	Department of Technological Machines and Equipment	units	0	0	1	1	0
4	Number of cooperation agreements/memorandums with top 700 foreign universities	units	0	1	3	2	3
	Department of "Standardization, certification and metrology"	units	0	0	0	1	1
	Department of Mechanical Engineering	units	0	1	0	0	0
	Department of Energy	units	0	0	1	0	0
	Department of General Physics	units	0	0	1	1	2
	Department of Engineering Mechanics	units	0	0	0	0	0
	Department of Technological Machines and Equipment	units	0	0	1	0	0
5.	The number of PhD students who defended their PhDs during the year	units	4	4	6	6	6
	Department of "Standardization, certification and metrology"	units	0	0	1	1	1
	Department of Mechanical Engineering	units	3	2	2	2	2
	Department of Energy	units	1	1	1	1	1
	Department of General Physics	units	0	0	1	1	1
	Department of Engineering Mechanics	units	0	0	0	0	0
	Department of Technological Machines and Equipment	units	0	1	1	1	1

Objective 3. International recognition and visibility through publications in top Q1 and Q2 journals – 315 scientific publications							
6.	Number of publications in foreign scientific journals indexed by Scopus	units	56	105	117	128	140
	Department of "Standardization, certification and metrology"	units	11	20	22	24	26
	Department of Mechanical Engineering	units	4	20	22	24	26
	Department of Energy	units	10	18	20	21	22
	Department of General Physics	units	10	13	15	18	22
	Department of Engineering Mechanics	units	8	16	18	20	22
	Department of Technological Machines and Equipment	units	13	18	20	21	22
7.	Field-Weighted Citation Impact (FWCI)	coeff.	0.76	0.80	0.82	0.86	0.90
	Department of "Standardization, certification and metrology"	coeff.	0.2	0.3	0.3	0.3	0.3
	Department of Mechanical Engineering	coeff.	0.1	0.1	0.1	0.1	0.1
	Department of Energy	coeff.	0.1	0.1	0.1	0.1	0.1
	Department of General Physics	coeff.	0.1	0.1	0.1	0.1	0.1
	Department of Engineering Mechanics	coeff.	0.1	0.1	0.1	0.1	0.1
	Department of Technological Machines and Equipment	coeff.	0.1	0.1	0.1	0.1	0.1
8.	The share of the university's expenditure on the development of educational and scientific laboratories	%	-	-	-	-	-
Objective 4. High-quality education through research – at least 10% of graduates receive a salary of over 1,000,000 tenge							
9.	The share of research funding in the total funding of the university	%	-	-	-	-	-
10.	Establishing a school for prototyping and startups	units	0	0	0	1	1
11.	Number of projects financed from the state budget	units	16	26	30	35	40
	Department of "Standardization, certification and metrology"	units	3	5	5	6	6
	Department of Mechanical Engineering	units	3	4	4	5	6
	Department of Energy	units	1	3	4	5	6

	Department of General Physics	units	5	6	7	8	9
	Department of Engineering Mechanics	units	2	4	5	6	7
	Department of Technological Machines and Equipment	units	2	4	5	5	6
12.	The share of those employed in the first year after completing their studies from the total number of graduates	%	67	70	71.5	72	90
	Department of "Standardization, certification and metrology"	%	92	92.50	93	93.50	94
	Department of Mechanical Engineering	%	80	82	83	84	85
	Department of Energy	%	80	81	82	83	84
	Department of General Physics	%	0	0	0	0	100
	Department of Engineering Mechanics	%	70	80	90	90	95
	Department of Technological Machines and Equipment	%	78	80	81	82	83
Task 5. Innovation, transfer and commercialization of new technologies (research into production) – the amount of contract research should be no less than 2 billion tenge per year							
13.	The number of new scientific laboratories created	units	0	1	0	4	0
	Department of "Standardization, certification and metrology"	units	0	1	0	1	0
	Department of Mechanical Engineering	units	0	0	0	0	0
	Department of Energy	units	0	0	0	1	0
	Department of General Physics	units	0	0	0	0	0
	Department of Engineering Mechanics	units	0	0	0	1	0
	Department of Technological Machines and Equipment	units	0	0	1	1	0
14.	Number of commercialized research projects	Quantity	3	26	32	34	36
	Department of "Standardization, certification and metrology"	Quantity	0	3	4	4	5
	Department of Mechanical Engineering	Quantity	0	8	9	9	9
	Department of Energy	Quantity	2	4	5	6	6

	Department of General Physics	Quantity	0	5	5	5	5
	Department of Engineering Mechanics	Quantity	0	0	2	3	4
	Department of Technological Machines and Equipment	Quantity	1	6	7	7	7
15.	The share of young scientists in the total number of scientists and researchers carrying out R&D and scientific research	%	24	31	36	40	46
	Department of "Standardization, certification and metrology"	Quantity	3	4	5	6	7
	Department of Mechanical Engineering	Quantity	4	5	6	7	8
	Department of Energy	Quantity	4	4	5	5	6
	Department of General Physics	Quantity	5	6	7	8	9
	Department of Engineering Mechanics	Quantity	5	6	6	6	6
	Department of Technological Machines and Equipment	Quantity	1	3	3	4	5
Task 6. Effective management – increasing the level of satisfaction with quality, the state of infrastructure, research, and the level of digitalization by at least 90%.							
16.	Improving living conditions for students through renovation and construction of new dormitories	units	-	-	-	-	-
17.	Increase in the number of electronic resources introduced into the educational process	units	6000	6560	7873	8635	9348
	Department of "Standardization, certification and metrology"	units	50	60	70	80	90
	Department of Mechanical Engineering	units	0	0	0	0	0
	Department of Energy	units	5800	6300	7600	8300	9000
	Department of General Physics	units	0	0	3	5	8
	Department of Engineering Mechanics	units	50	50	50	50	50
	Department of Technological Machines and Equipment	units	100	150	150	200	200
18.	Satisfaction of students, staff and faculty with university services	%	75	80	85	87	90

Appendix 2 to the Development Program of the non-profit joint-stock company "Kazakh National Research Technical University named after K.I. Satpayev" for 2023–2027

Action plan for the implementation of the Development Program of the A. Burkitbaev Institute of Power Engineering and Mechanical Engineering for 2023–2027

Item No.	Events	Unit of measurement	Direct outcome indicators					Completion form
			2023	2024	2025	2026	2027	
1	2	3	4	5	6	7	8	9
Task 1. Integration of scientific activity and the educational process at all levels of higher and postgraduate education								
1.	Increasing the share of invited practitioners from production in the total number of teaching staff	%	11	10	14	29	27	reporting information
	Department of "Standardization, certification and metrology"	Quantity	5	5	5	10	10	
	Department of Mechanical Engineering	Quantity	1	1	1	2	2	
	Department of Energy	Quantity	3	3	3	3	3	
	Department of General Physics	Quantity	0	0	5	10	10	
	Department of Engineering Mechanics	Quantity	0	0	0	5	5	
	Department of Technological Machines and Equipment	Quantity	1	1	1	2	2	
2.	Increasing the proportion of students and faculty sent on internships within the framework of cooperation with foreign universities	%	2.5	13	3	4.5	15	reporting information
	Department of "Standardization, certification and metrology"	Quantity	0	0	0	1	2	
	Department of Mechanical Engineering	Quantity	0	1	1	1	2	
	Department of Energy	Quantity	1	1	1	1	1	
	Department of General Physics	Quantity	0	0	0	1	2	
	Department of Engineering Mechanics	Quantity	0	10	0	0	10	

	Department of Technological Machines and Equipment	Quantity	1	1	1	1	1	
Task 2. Preparing the next generation of leaders – 10% of PhD students from the total number of students								
3.	Allocation of additional intra-university funded grants for research	units	0	1	1	2	2	reporting information, contracts
	Department of "Standardization, certification and metrology"	units	0	0	0	0	0	
	Department of Mechanical Engineering	units	0	0	0	0	0	
	Department of Energy	units	0	1	1	1	1	
	Department of General Physics	units	0	0	0	0	0	
	Department of Engineering Mechanics	units	0	0	0	1	1	
	Department of Technological Machines and Equipment	units	0	0	0	0	0	
4.	Increasing the number of postdoctoral programs	units	0	0	1	2	3	reporting information, orders
	Department of "Standardization, certification and metrology"	units	0	0	1	1	1	
	Department of Mechanical Engineering	units	0	0	0	0	0	
	Department of Energy	units	0	0	0	1	1	
	Department of General Physics	units	0	0	0	0	1	
	Department of Engineering Mechanics	units	0	0	0	0	0	
	Department of Technological Machines and Equipment	units	0	0	0	0	0	
Objective 3. International recognition and visibility through publications in top Q1 and Q2 journals – 315 scientific publications								
5.	Increasing the annual volume of incentive payments for publication activity in high-ranking publications	million tenge	-	-	-	-	-	reporting information
6.	Increased seminars and courses on research methodology, statistical analysis, laboratory techniques, scientific writing, and	units	-	-	-	-	-	reporting information

	citation management							
7.	Increasing the number of scientific publications indexed by Scopus or Web of Science databases	units	56	105	117	128	140	indexed publications
	Department of "Standardization, certification and metrology"	units	11	20	22	24	26	
	Department of Mechanical Engineering	units	4	20	22	24	26	
	Department of Energy	units	10	18	20	21	22	
	Department of General Physics	units	10	13	15	18	22	
	Department of Engineering Mechanics	units	8	16	18	20	22	
	Department of Technological Machines and Equipment	units	13	18	20	21	22	
Objective 4. High-quality education through research – at least 10% of graduates receive a salary of over 1,000,000 tenge								
8.	Increasing the number of scientific development fairs and conferences held with the participation of industry and business	units	2	2	4	5	4	reporting information
	Department of "Standardization, certification and metrology"	units	1	1	1	1	1	
	Department of Mechanical Engineering	units	0	0	0	0	0	
	Department of Energy	units	1	1	1	1	1	
	Department of General Physics	units	0	0	1	1	1	
	Department of Engineering Mechanics	units	0	0	1	1	1	
	Department of Technological Machines and Equipment	units	0	0	0	1	0	
9.	Increasing the number of start-up projects by university students and staff	units	2	2	4	3	3	contracts
	Department of "Standardization, certification and metrology"	units	0	0	0	0	0	
	Department of Mechanical Engineering		1	1	1	1	1	
	Department of Energy		1	1	1	1	1	
	Department of General Physics		0	0	0	0	0	

	Department of Engineering Mechanics		0	0	1	0	0	
	Department of Technological Machines and Equipment	units	0	0	1	1	1	
10.	Increasing the level of employer satisfaction with the quality of graduate training	%	61	68	74	75	80	survey results
	Department of "Standardization, certification and metrology"	%	-	-	-	70	80	
	Department of Mechanical Engineering	%	50	60	70	80	80	
	Department of Energy	%	40	50	60	65	70	
	Department of General Physics	%	-	-	-	-	-	
	Department of Engineering Mechanics	%	75	80	80	-	-	
	Department of Technological Machines and Equipment	%	80	80	85	85	90	
Task 5. Innovation, transfer and commercialization of new technologies (research into production) – the amount of contract research is not less than 2 billion tenge per year								
11.	Increase in the number of patents and other protection documents obtained (industrial designs, utility models and copyrights)	units	7	7	9	11	12	patents, copyright certificates
	Department of "Standardization, certification and metrology"	units	0	0	1	1	1	
	Department of Mechanical Engineering	units	1	1	1	2	2	
	Department of Energy	units	2	2	2	2	2	
	Department of General Physics	units	0	0	0	1	1	
	Department of Engineering Mechanics	units	1	1	1	1	1	
	Department of Technological Machines and Equipment	units	3	3	4	4	5	
12.	Increase in the number of scientific/testing laboratories with accreditation, compared to the 2023 level (2023 – 3)	units	0	0	1	1	2	accreditation certificates
	Department of "Standardization, certification and metrology"	units	0	0	0	0	1	

	Department of Mechanical Engineering	units	0	0	0	0	0	
	Department of Energy	units	0	0	0	1	1	
	Department of General Physics	units	0	0	0	0	0	
	Department of Engineering Mechanics	units	0	0	0	0	0	
	Department of Technological Machines and Equipment	units	0	0	1	0	0	
13.	Annual increase in the number of projects for the commercialization of the results of scientific and (or) scientific and technical activities	units	3	5	7	7	8	contracts, reporting information
	Department of "Standardization, certification and metrology"	units	0	0	1	1	1	
	Department of Mechanical Engineering	units	0	0	1	1	1	
	Department of Energy	units	2	2	2	2	2	
	Department of General Physics	units	0	0	0	1	1	
	Department of Engineering Mechanics	units	0	2	1	0	1	
	Department of Technological Machines and Equipment	units	1	1	2	2	2	
Task 6. Effective management – increasing the level of satisfaction with quality, the state of infrastructure, research, and the level of digitalization by at least 90%.								
14.	Improving the condition of infrastructure based on assessments or feedback from faculty, staff and students	%	-	-	-	-	-	survey results
15.	Increasing funding for the repair and modernization of existing dormitories	million tenge	-	-	-	-	-	reporting information
16.	Increasing the income of the teaching staff	thousand tenge	-	-	-	-	-	reporting information