Approving it
Head of the Department Эof Economics
_ _ _ _ _ _ _ Neshina E. G.
"__" _____ 2024 city of

Plan
scientific research work
Departments of "Energy Systems"
for 2024-202–2025 academic year

№ n /	*a Activities*	*Completion dates*	*Responsible executor*	*Mark of*
	completion R& D implementation: 1.1 Development of an intelligent fiber-optic system for monitoring the geotechnical state of mine workings of quarries and open-pit mines 1.1.1 development of an algorithm for the operation of an intelligent hardware and software complex of the monitoring system; 1.1.2 preparation for laboratory tests of a fiber-optic sensor to determine optimal parameters; 1.1.3 development of a sensor control code in the Python programming language version 3.11; 1.1.4 conducting tests on a computer model; 1.1.5 making a report;	November 2024 December 2024 March 2025 May 2025 June 2025	Neshina E..G..	
1.	1. 2 Development and research of a model of alternative fuel cells of hydrogen energy based on high-temperature proton conductors. 1.2.1 Analysis of existing experimental and theoretical methods and results of studying the conductivity of solid electrolytes based on high-temperature proton conductors (HPP). Determination of directions for further research of the properties of electrolytic materials based on RUNWAY. 1.2.2 Development of a physical and mathematical model of electric charge transfer in solid electrolytes based on hydrogen-bonded crystals (HCS) in the high-temperature range in the region of weak electric fields. 1.2.3 Experimental investigation of the mechanism of electric charge transfer in solid electrolytes based on KVS. Measurement of the KVS thermal conductivity current spectra in the AC field frequency range of 1 kHz-10 MHz. Mathematical processing of measurement results. 1.2.4 Development of an algorithm for computer calculation of the crystal lattice and EMF parameters for a model fuel cell based on high-temperature proton conductors (TPP). 1.2.5 Development and implementation of methods for automatic control of electrical characteristics of a model fuel cell based on a runway.	november-December 2024 december 2024-February 2025 February-April 2025 May 2025	Kalytka V. A.	

		June 2025		
	1. 3 Reducing the energy intensity of industrial production 1.3.1 Analysis of energy efficiency of industrial enterprises 1.3.2 Development of a set of measures to reduce energy intensity and improve the energy efficiency of industrial enterprises 1.3.3 Estimation of payback period and reduction of production costs 1.3.4 Preparation of the report	November 2024 December 2024-March 2025 May 2025 June 2025	Balandin V. S.	
	1. 4 Creation of an experimental industrial sample of an innovative passenger air lift for buildings and structures 1.4.1 Development of design and development of experimental and industrial samples of multi-storey passenger air lift 1.4.2 Development of technological documentation of pilot designs of multi-storey passenger air lift 1.4.3 Development of stop devices for stopping the cab on the corresponding floor and the design of cab doors and doors on floors with sealing elements 1.4.4 Research, search and selection of materials for sealing devices 1.4.5 Preparation of the report	October 2024 November-December 2024 February-March 2025 April-June 2025 May 2025	Taranov A.V.	
2.	Publication of R 2.1 & Dresults Preparation of articles and monographs SA-1 Scopus article -3 articles KOKSON VO-4 statisticsьи of the Monograph – 1 3.2 Participation in conferences-20 reports	During the academic year	Taranov A.V., Kalytka V. A. Isaev V. L. Neshina E. G. Teaching staff of the Department	
3.	Inventive activity. Submission of 5 applicationsок for a patent Submission of 5 applicationsок for a copyright certificate	During the academic year	Neshina E. G. Teaching staff of the Department	
4.	International Activities Cooperation with professors of Universities of far and near abroad for joint publications in peer-reviewed journals included in the Scopus and Web of Science databases: 1. Research Institute of TPU, Galtseva O. N. (Russian Federation) 2. Research Institute of TPU, Yurchenko A.V. (Russian Federation) 3. Research Institute of TPU, L. A. Alkaderi (Russian Federation)	Duringthe the academic year	Neshina E. G. Taranov A.V.	

5.	Scientific research work with students	according	to the NIRS plan Brazhanova D. K.	
6.	Work with enterprises of the corporate university	According to the KU plan		

Head of NIL Brazhanova D. K.