ПАНЕЛЬНАЯ ДИСКУССИЯ
«Развитие технологий РМ и РЗМ для энергетического перехода и устойчивого развития» (ПД 1)

PANEL DISCUSSION
« Rare metal technologies for the energy transition and sustainable development» (PD 1)

Date: May 20, 2026

ТЕМЫ ДЛЯ ОБСУЖДЕНИЯ / DISCUSSION TOPICS

Панельная дискуссия посвящена роли редких и редкоземельных металлов в обеспечении энергетического перехода, устойчивого развития и формирования новых технологических цепочек для низкоуглеродной экономики. Редкие металлы становятся не только сырьевой основой, но и стратегическим фактором развития водородной энергетики, аккумуляторных систем, ветроэнергетики, солнечной энергетики, силовой электроники, электротранспорта, систем накопления энергии и других критически важных технологий.

В центре обсуждения — вопросы сырьевой и технологической безопасности, устойчивого снабжения, глубокой переработки минерального и техногенного сырья, рециклинга, снижения экологического следа и создания замкнутых производственных цепочек. Особое внимание будет уделено тому, как новые технологии добычи, разделения, металлургии, получения высокочистых веществ, функциональных материалов и компонентов могут способствовать переходу от сырьевой модели к производству продукции с высокой добавленной стоимостью.

Важным направлением дискуссии станет международная кооперация, включая взаимодействие России, Индии, Вьетнама и других стран в области критических материалов, технологического трансфера, совместных промышленных проектов и формирования более устойчивых глобальных цепочек поставок для энергетики будущего.

The panel discussion will focus on the role of rare and rare earth metals in enabling the energy transition, sustainable development and the formation of new technological value chains for a low-carbon economy. Rare metals are becoming not only a critical raw material base, but also a strategic factor for the development of hydrogen energy, battery systems, wind power, solar energy, power electronics, electric mobility, energy storage systems and other key technologies.

The discussion will address resource and technological security, sustainable supply, advanced processing of mineral and technogenic raw materials, recycling, reduction of environmental impact and the development of closed-loop production chains. Special attention will be given to how new technologies for mining, separation, metallurgy, high-purity substances, functional materials and components can support the transition from raw material supply to high-value-added industrial production.

An important focus will be international cooperation, including collaboration between Russia, India, Vietnam and other countries in critical materials, technology transfer, joint industrial projects and the creation of more resilient global supply chains for the energy systems of the future.

КЛЮЧЕВЫЕ СПИКЕРЫ / KEY SPEAKERS :

Модератор: **Ивановских Константин Васильевич** – Заместитель директора по науке и инновациям, АО «Гиредмет», ГК «Росатом»	**Chairman:** **Konstantin V. Ivanovskikh** – Deputy Director for Research & Innovation, GIREDMET State Research & Design Institute of Rare Metal Industry, ROSATOM
Sandeep Poundrik – Secretary of the Ministry of Steel, Government of India **Deependra Singh** – President of Rare Earth Association of India, **Mikhail N. Yurin** – Deputy Minister of Industry and Trade of the Russian Federation **Сергеев Александр Михайлович** – научный руководитель, Национальный центр физики и математики (НЦФМ), академик РАН **Сарада Бхушан Моханти** – председатель и управляющий директор компании IREL (Индия) Лимитед (IREL) **Эджаз Ахмад** – руководитель Центра водородных технологий и технологий улавливания, использования и хранения углерода им. Нареша Вашишта, Индийский технологический институт (ISM), Дханбад. **Ратно Нуряди** – председатель исследовательской организации по нанотехнологиям и материалам, Национального агентства исследований и инноваций Индонезии (BRIN). **Димухамедов Руслан Рафхатович** – генеральный директор АО «СМЗ», председатель Ассоциации РМ и РЗМ **Халед Нагейб** – генеральный директор и основатель компании «Hydrogen Egypt» (H2EG), Египет.	**Sandeep Poundrik** – Секретарь Министерства стали, Индия **Deependra Singh**, President of Rare Earth Association of India, **Mikhail N. Yurin** – Deputy Minister of Industry and Trade of the Russian Federation **Alexander M. Sergeev** – National Center for Physics and Mathematics (NCPM), Academician of the RAS **Sarada Bhushan Mohanty**, Chairman & Managing Director, IREL (INDIA) Limited (IREL). **Ejaz Ahmad** – Dr., Head of Naresh Vashisht Centre for Hydrogen and CCUS Technologies, and Faculty, In charge of Sponsored Research & Industrial Consultancy at IIT ISM Dhanbad **Ratno Nuryadi** – Chairman of Research Organization for Nanotechnology and Materials, Indonesia's National Research and Innovation Agency (BRIN), Indonesia **Ruslan R. Dimukhamedov –** Director General of JSC “SMZ”, Chairman of the Association of Rare Metals and Rare Earth Elements **Khaled Nageib** – Египет - CEO and Founder of Hydrogen Egypt (H_2EG), Egypt

SHORT BIO OF SPEAKERS

1. Sandeep Poundrik
Secretary, Ministry of Steel, Government of India

Sandeep Poundrik is an Indian Administrative Service officer of the 1993 Bihar cadre and currently serves as Secretary, Ministry of Steel, Government of India. He oversees national steel policy, coordination with public-sector steel companies and implementation of India's long-term capacity and decarbonization goals. His professional background includes senior government roles in industry, petroleum and natural gas, and disaster management. In public forums he emphasizes green steel, DRI plus hydrogen routes, self-reliance, quality control and international partnerships for sustainable growth of India's steel and materials industries.

2. Mikhail N. Yurin
Deputy Minister of Industry and Trade of the Russian Federation

Mikhail N. Yurin is Deputy Minister of Industry and Trade of the Russian Federation. His area of responsibility includes industrial policy related to mining, rare and rare-earth metals and strategic raw-material projects. He is directly involved in the federal project for development of the rare and rare-earth metals industry, including assessment of production capacities, state-support instruments and investment mechanisms. He also represents Russia in intergovernmental and international industrial cooperation formats, including BRICS and bilateral working groups with partner countries.

3. Alexander M. Sergeev
Academician of the Russian Academy of Sciences

Alexander M. Sergeev is an Academician of the Russian Academy of Sciences and a member of its Presidium. From 2017 to 2022 he served as President of the Russian Academy of Sciences. He is a leading specialist in laser physics, femtosecond optics, nonlinear interaction of ultrashort optical fields with matter and high-field physics. His work contributed to the development of powerful ultrashort-pulse laser systems and new applications in compact accelerators, material micro- and nanomodification, optical bioimaging and optical tomography. He is a recipient of major national and international scientific awards.

4. Konstantin V. Ivanovskikh
Deputy Director for Research and Innovation, GIREDMET JSC, ROSATOM

Konstantin V. Ivanovskikh is Deputy Director for Research and Innovation at GIREDMET JSC, ROSATOM. He manages R&D and technology development in rare and rare-earth metals, high-purity compounds, refractory metal powders, optical and semiconductor materials, detector materials, energy-conversion systems and hydrogen-related technologies. His background combines industrial R&D leadership with international scientific experience in France, the Netherlands and New Zealand. He has authored more than 80 scientific papers and patents, and co-chairs RAREMET as an international platform for rare-metal science, technology and industry.

5. Deependra Singh
President, Rare Earth Association of India; former CMD, IREL (India) Limited

Dr Deependra Singh is President of the Rare Earth Association of India and former Chairman and Managing Director of IREL (India) Limited. He has 35 years of experience in critical minerals, rare earths, strategy, technology acquisition, international trade, industrial design, skill development and global business development. At IREL he led the company's transition from loss-making to sustainable profitability and supported India's first rare-earth permanent magnet facility based on indigenous technology. His work spans rare-earth refining, downstream products, policy frameworks, resource acquisition and industrial human-resource development.

6. Sarada Bhushan Mohanty
Chairman and Managing Director, IREL (India) Limited

Sarada Bhushan Mohanty is a senior Indian public-sector executive in the strategic minerals sector. He serves as Director (Finance) of IREL (India) Limited and has held charge as Chairman and Managing Director of the company. IREL is a central public sector enterprise under the Department of Atomic Energy, responsible for beach sand minerals and rare earths. His professional experience covers taxation, compliance, finance and strategic management, with a strong focus on metals and mining. He is involved in financial planning and project development for rare-earth products, value-added materials and downstream applications.

7. Ratno Nuryadi
Chairman, Research Organization for Nanotechnology and Materials, BRIN, Indonesia

Prof. Dr. Ratno Nuryadi is Chairman of the Research Organization for Nanotechnology and Materials at Indonesia's National Research and Innovation Agency, BRIN. He leads a network of research centers working in nanotechnology, advanced materials, photonics and related fields, including mineral technology. His research background includes physics, nanoelectronics and nanosensors. Under his leadership, the organization promotes open-platform collaboration and access to advanced research equipment. He represents Indonesia in international scientific and industrial forums and supports innovation in critical and strategic minerals, including rare earth elements.

8. Khaled Nageib
Founder and CEO, Hydrogen Egypt (H2EG)

Khaled Nageib is Founder and CEO of Hydrogen Egypt (H2EG) and Founder of the Egyptian Ports Development Group. He has more than 30 years of experience across energy, petrochemicals, ports, maritime logistics, infrastructure, finance, policy and regulation, with a recent focus on renewables and hydrogen ecosystems. He supports hydrogen valleys, energy-transition strategies, coalition building and strategic positioning for new industrial projects. His professional experience covers commercial model development, port strategy, LNG and CNG activities, greenfield infrastructure and international projects in Egypt, the Middle East and Africa.

9. Ruslan R. Dimukhamedov
Chairman, Association of Producers and Consumers of Rare and Rare-Earth Metals; CEO, Solikamsk Magnesium Plant

Ruslan R. Dimukhamedov is Chairman of the Association of Producers and Consumers of Rare and Rare-Earth Metals and General Director of Solikamsk Magnesium Plant. Since 2020 he has led the industry association representing Russia's rare and rare-earth metals sector. His professional background includes senior positions in companies within ROSATOM's perimeter, including TENEX and Atomredmetzoloto, as well as extensive experience in project management, corporate governance, investment analysis and interaction with public authorities. He has deep expertise in uranium, precious-metal and rare-metal enterprises.

10. Ejaz Ahmad
Assistant Professor, Department of Chemical Engineering, IIT (ISM) Dhanbad

Dr Ejaz Ahmad is Assistant Professor in the Department of Chemical Engineering at the Indian Institute of Technology (ISM) Dhanbad and Coordinator for Sponsored Research and Industrial Consultancy. His research covers heterogeneous catalysis, green chemistry, sustainable energy, biofuels, biomass conversion, thermo-catalytic reforming, solid waste management, metal recovery from e-waste and lithium batteries, and waste plastic conversion. He has industrial experience in process engineering and technology development and has led projects on bio-coal, solid-waste management, catalytic materials, decentralized waste-plastic conversion and biomass-based fuels.

ОСНОВНЫЕ ВОПРОСЫ ДЛЯ ОБСУЖДЕНИЯ В РАМКАХ ПАНЕЛЬНОЙ ДИСКУССИИ:

MAIN QUESTIONS FOR DISCUSSION WITHIN THE FRAMEWORK OF THE PANEL DISCUSSION:

	Темы обсуждения	**Topics for Discussion**
1	Энергетический переход и роль редких и редкоземельных металлов. Материалы для водородной энергетики, аккумуляторных систем, топливных элементов, ветроэнергетики и других ВИЭ. Глобальный рост спроса на литий, РЗМ, тугоплавкие и рассеянные металлы. Баланс между развитием «зелёной» энергетики и углеродным следом добычи и переработки.	Energy transition and the role of rare and rare earth metals. Materials for hydrogen energy, battery systems, fuel cells, wind power, and other renewable energy technologies. Global demand growth for lithium, REEs, refractory and dispersed metals. Balancing clean energy expansion with the carbon footprint of mining and processing.
2	Новые источники сырья и ресурсная база. Перспективы освоения месторождений Крайнего Севера и Арктики. Океанические ресурсы. Переработка техногенных отходов (e-waste, шламы, хвосты). Роль вторичных ресурсов в снижении зависимости от ограниченного числа поставщиков. Современные технологии переработки и рециклинга.	New resource base and supply sources. Development prospects of Arctic and Far North deposits. Ocean resources. Processing of technogenic waste (e-waste, tailings, sludges). The role of secondary resources in reducing dependence on limited suppliers. Advanced recycling and processing technologies.
3	Глобальные цепочки поставок и сырьевая безопасность. Концентрация производства в отдельных странах и риски монополизации. Национальные стратегии по критическим минералам (Россия, Индия, страны Азии и др.). Международные форматы сотрудничества и «минеральная дипломатия».	Global supply chains and resource security. Production concentration in selected countries and monopolization risks. National critical minerals strategies (Russia, India, Asian countries, etc.). International cooperation frameworks and “mineral diplomacy”.
	Вопрос, связанный с индонезийским аспектом индустрии редких металлов: Разработка инновационных технологий извлечения редкоземельных элементов (РЗЭ) из первичных ресурсов, таких как монацит и ионно-адсорбционные глины (IAC), а также из ценных промышленных отходов, приобретает все большее значение. Эти усилия не только повышают добавленную стоимость ресурсов и ускоряют развитие перерабатывающих отраслей, но и усиливают конкурентоспособность в глобальной цепочке поставок критически важных минералов.	Question related to Indonesian aspect of Rare Metal Industry: The development of innovative technologies for the extraction of Rare Earth Elements (REEs) from primary resources such as monazite and ion-adsorption clay (IAC), as well as from valuable industrial residues, is increasingly important. These efforts not only increase resource added value and accelerate downstream industries, but also strengthen competitiveness in the global critical mineral supply chain.

4	Инновационные технологии в металлургии и переработке: • Водородная металлургия стали (H2-DRI, интеграция с EAF, материалы для электролизёров, мембран и катализаторов, предотвращение водородной хрупкости, цифровой контроль процессов) • Порошковая металлургия (легированные порошки, аддитивные технологии, покрытия, керметы и композиты) • Циркулярная экономика на металлургических предприятиях (извлечение Sc, РЗМ, V, Ti, Nb, Ta, Ga, Ge, In и др. из шлаков, пыли, шламов и окалины)	Innovative metallurgical and processing technologies: • Hydrogen metallurgy for steel (H2-DRI, EAF integration, materials for electrolyzers, membranes and catalysts, hydrogen embrittlement mitigation, digital process control) • Powder metallurgy (alloy powders, additive manufacturing, hardfacing materials, cermets and composites) • Circular economy within steel plants (recovery of Sc, REEs, V, Ti, Nb, Ta, Ga, Ge, In, etc. from slag, dust, sludge, and mill scale)
5	Редкие и редкоземельные металлы в стратегических технологиях. Магнитные материалы для электромобилей и ветроэнергетики: снижение доли тяжёлых РЗМ (Dy, Tb), разработка новых композиций.	Rare and rare earth metals in strategic technologies. Magnetic materials for electric vehicles and wind energy: reducing heavy REE content (Dy, Tb) and developing new compositions.
6	Оптоэлектронные и фотонные материалы: повышение эффективности солнечных элементов и светодиодов.	Optoelectronic and photonic materials: improving efficiency of solar cells and LEDs.
7	Экологические аспекты и ESG-повестка. Углеродный и водный след производства редких металлов. Разработка международных стандартов устойчивого снабжения. Экологические и социальные риски, повышение прозрачности и ответственности отрасли.	Environmental and ESG agenda. Carbon and water footprint of rare metals production. Development of international standards for sustainable sourcing. Environmental and social risks, increasing transparency and accountability across the industry.
8	Глобальный баланс между «зелёной» энергетикой и экологическим следом добычи и переработки. Концентрация добычи, переработки и производства компонентов в ограниченном числе стран создаёт риски для энергетического перехода. Национальные стратегии критических минералов, диверсификация поставок, технологическая независимость, долгосрочные контракты, стратегические резервы и международная «минеральная дипломатия».	Balancing green energy development with the environmental footprint of mining and processing The concentration of mining, processing and component manufacturing in a limited number of countries creates risks for the energy transition. National critical mineral strategies, supply diversification, technological independence, long-term contracts, strategic reserves and international mineral diplomacy.