



mineral resources
& energy

Department:
Mineral Resources and Energy
REPUBLIC OF SOUTH AFRICA



2023 **BRICS YOUTH
ENERGY SUMMIT**
SOUTH AFRICA



3-4 AUGUST 2023

Speaker's Profiles

3.30pm-4.30 pm

Thematic Session 5: THE SDG7 ENERGY ENABLERS: CRITICAL MINERALS AND CIRCULAR ECONOMY

Scriber: Lindiwe Morwenyane & Nelson Ntlou

Venue: Venus

Session description:

The global energy transition is characterized by an accelerated rate of clean technologies deployment to help mitigate the adverse effects of climate change by reducing carbon emissions.

Yet, manufacturing more green energy technologies requires an ever-growing amount of critical minerals, among which there is lithium, cobalt, nickel, and manganese. Despite being used to produce “clean” technologies, the extraction and processing of critical minerals remains a highly unsustainable practice and is associated with significant environmental implications.

On the end-of-life side, low-carbon energy technologies generate excessive streams of waste which contain metals that can be recuperated and reintroduced in the production cycle, thus reducing the need of extracting more. As of now, circularity remains one of the most promising solutions to curbing pollution and easing pressure on the environment where extraction and disposal take place.

At this session, delegates will learn about the impact of sourcing critical minerals needed for the energy transition and whether the existing negative effects could be removed through enhancing circular practices along the clean energy value chain.

Questions for Discussion:

1. What is the interplay between accelerating the energy transition and sourcing more critical minerals?
2. What is the environmental impact of extracting critical minerals?
3. How can we ensure sustainability along the clean energy value chain to make sure that it is not just the end user who benefits from the transition?
4. Can the circular economy be the solution to critical minerals depletion and waste management?
5. How can we integrate circularity across the whole clean energy industry?

Moderation:

- **Dr. Nandi Malumbazo**, Senior Lecture, Wits University



Dr Nandi Malumbazo's remarkable academic achievements have established her as a valuable and respected mind in the mining and energy academic spheres. After she graduated her PhD in 2011, she was immediately employed by CSIR as a Researcher at the Material Science and Manufacturing under Energy and Processes Unit. With in-depth scientific research background, Dr Malumbazo

has also spent nine (9) years as a Chief Scientist at the Council for Geoscience. She is currently holding a position as a Senior Lecturer and Researcher on Clean Coal Technology at the School of Chemical and Metallurgical Engineering, University of Witwatersrand. She is also a Sessional Lecturer at the Wits Business School with a focus on Energy Policy and Regulation. Her research interests are centered on various energy topics and has a keen interest on the “Use of Coal Waste Resources beyond Power Generation for Circular Economy” and “Just Energy Transition”. She is also a board member at Energy and Water SETA. Dr Nandi Malumbazo is a recipient of the 2022 Association of Energy Engineers (AEE) Sub-Saharan Energy Development award winner as well as the 2023 Women of Stature in Science and Innovation award winner.

Panelists:

- **Mpho Ledwaba**, Mintek,



Mpho Ledwaba is a highly accomplished and dedicated scientist specializing in hydrometallurgy and sustainable energy solutions. As a post-doctoral fellow at Mintek, she focuses on developing efficient and environmentally friendly processes for metal extraction from ores and waste materials. Mpho's academic journey began with a strong interest in chemistry, leading her to pursue a PhD in chemistry at Stellenbosch University. Her doctoral research explored advanced topics in hydrogen storage, providing her with a solid foundation in the field of energy. During her time as a student researcher at the Council for Scientific and Industrial Research (CSIR), Mpho conducted ground-breaking research on hydrogen storage using Metal-Organic Frameworks (MOFs). Her work showcased her versatility and ability to tackle complex challenges in the energy sector. Mpho also gained practical experience as a lab analyst in the fertilizer industry, further

enhancing her understanding of industrial applications. Mpho's dedication to sustainability and her passion for finding innovative solutions have made her a driving force in the pursuit of more efficient and environmentally friendly metal extraction processes. Her expertise and commitment have earned her recognition in the scientific community, and she continues to contribute significantly to the advancement of hydrometallurgy and clean energy technologies.

- **Ms Sharon Mogomotsi**, Director: Hazardous Waste Management DFFE



Sharon Mogomotsi is a Director for Hazardous Waste Management in the national Department of Forestry, Fisheries and the Environment, within the Chemicals and Waste Management branch. She has public sector work experience spanning 15 years in the waste management field. She also worked in the private sector experience in the mining and metals company where she was responsible for safety, health, environment, and quality management systems. She holds several qualifications including Master of Science in Engineering (Environmental field), BSc Honours (Biochemistry), and Certificates in Management Advancement Programme and Safety Management amongst others. As part of her responsibilities in government, she heads a unit that is responsible for the development of regulatory instruments for specific hazardous waste management and ensuring the implementation of hazardous waste legislation and multilateral environmental agreements. Her focus areas are on Extended Producer Responsibility for priority hazardous waste, waste classification, medical waste, electronic waste and many others.

- **Prof. Nikki Wagner**, Geology Department, University of Johannesburg (UJ)



Prof Nikki (Nicola) Wagner is the Director of the DSI-NRF Centre of Excellence in Integrated Mineral and Energy Resource Analysis (CIMERA) and Professor in the Geology Department at the University of Johannesburg, Johannesburg, South Africa. Prof Wagner interests lie in the energy space, and, through CIMERA, she is involved in Africa's mineral wealth and human capacity development. Her specialist research areas include organic petrology, coal petrography, trace elements and critical raw materials in coal and associated products, coal geology, carbon dioxide capture and storage, coal oxidation, underground coal gasification, coal conversion, ash utilization, and so on.

Nikki graduated from RHBNC, London, with a geology-zoology Honours degree, and completed her Phd in 1998 (Wits). Shortly thereafter, Dr Wagner worked for Sasol in their Coal to Syngas Research Group, as the inhouse coal petrographer. Prof Wagner joined the School of Chemical and Metallurgical Engineering at the University of the Witwatersrand, Johannesburg, in 2006, where she ran the Coal Research group for 8 years before moving back into geology at the University of Johannesburg in 2014.

Prof Wagner has over 70 peer reviewed publications and produced a book on coal petrology. She has graduated over 45 postgraduate students, and is an active peer reviewer for over 10 research journals, is accredited by the International Committee for Organic Petrology (ICCP), and is the elected editor of the ICCP News, where she also serves on the Council. Prof Wagner is a Fellow of the Geological Society of South Africa (GSSA), and member of the FFF-C, SEG, and SACNASP, and has a B NRF rating. Prof Wagner has three children.

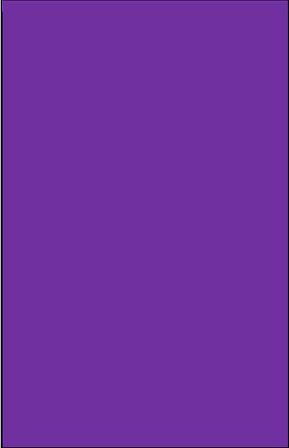


- **Ms. Yuhan Zheng**, Member, UNECE Resource Management Young Member Group

Currently, as a PhD student in the Geography department at the National University of Ireland, and an intern at the UNFCCC secretariat in Bonn Germany (Intergovernmental Process of Global Stocktake under Paris Agreement), my research and career focus are mostly on the global governance of energy transition under climate change context. Specifically, I am deeply engaged in unraveling the nuances of energy transition interpretations in different local context and seeking effective mechanisms to foster coherence amidst diverse perception.

Before embarking on my Ph.D., I delved into the domains of urban sustainability, climate resilience, urban resilience, and smart cities for over 3.5 years. My dedication to scholarly excellence is reflected in numerous publications and impactful conference presentations (which can be seen at my personal website: <https://sites.google.com/view/yuhan-zheng/homepage>).

I'm simultaneously as a youth advocate for climate change and energy transition on the global stage. My representation at prominent events includes the 13th International Renewable Energy Agency Assembly (UAE); the top future leaders in the 52nd St.Gallen Symposium (Switzerland); Youth session speakers at UNECE Resource Management Week 2023; keynote speaker at the 2023 Youth Innovative Competition on Global Governance (UNDP); Asia region representative for the youth forum at the Vienna Energy Forum (Nov,2023) under SDG7, etc. I endeavor to harness the potential of collaborative efforts in shaping a sustainable and equitable future.

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- **Mr. John Youhanes Nhial Magok**, Expert on Minerals Resources Development, African Union Commission
 - **Mr. Fabrice Kaburugutu**, Founder and CEO, Association of Young