Energy continues to be a key driver for global economic growth. Energy sparked the first industrial revolution in the 1760s' and continued to play a fundamental role in the subsequent revolutions. This era was marked by the invention of steam engines which made use of water and the release of steam power leading to the rise of trains and mechanization of manufacturing. The availability of fuels like coal contributed to making the steam engine significant during this revolution period.

The production of energy and its use contributes significantly to global warming. It is estimated to contribute about two-thirds of generated human-induced greenhouse gas emissions. Over the years, the world has been transitioning towards a cleaner and more sustainable future due to global calls for action and regulations to combat climate change. Climate Action, Sustainable Consumption and Production, as well as Affordable and Clean Energy are three (3) of the seventeen (17) Sustainable Development Goals (SDGs) linked to the energy transition.

In commemoration of the International Day of Clean Energy, it is important to reflect on the significance of clean energy and the potential of various industries like mining to be key drivers of a sustainable future.

The past ten to fifteen years have experienced considerable progress across global, continental and national level in the energy sector. Awareness of the need to transition from fossil fuels to zero-carbon energy has grown substantially, laying the foundation for meaningful progress in this crucial area. Namibia's renewable energy potential has been quantified and incorporated into the National Integrated Resource Plan (NIRP). Meanwhile, renewable energy technologies, particularly solar and wind, have matured significantly, with costs dropping to competitive levels with traditional energy generation technologies, enabling hybrid solutions to be capable of achieving up to 50% renewable energy penetration. The Namibian regulatory framework has also evolved, with the Modified Single Buyer (MSB) model allowing contestable customers to trade up to 30% of their energy needs with Independent Power Producers (IPPs). To date, 31contestable customers, accounting for 516 GWh (about 7% of national demand), have registered under this model and seven (7) of them have reached operational status. Additionally, the technical hurdle of how Renewable Energy Generation Plants can power large energy-intensive users such as mining operations has been bridged.

As the world grapples with the urgent need for sustainability, the role of the mining industry in driving the transition to clean energy cannot be understated. The mining industry is energy-intensive, and the cost of

energy currently stands between 30% and 40% of operating costs of a mining company. The sector now stands at the forefront of innovation, poised to transform its operations to align with global sustainability goals as well as reducing the cost of energy. While mining is an energy-intensive activity as well as a high carbon emitting industry, the generation of green energy requires more metals and minerals and therefore more mining activities. This conundrum assures us that the mining industry is here to stay but we should adopt climate-smart mining practices such as the integration of renewable energy in the energy mix of operations.

Mining in Namibia has traditionally been a top contributor to the local economy through the procurement of local content, Royalties and Taxes as well as Wages and Salaries. In its 2023 annual review, the Namibian Chamber of Mines reported that mining's contribution to GDP was 14.4%, N$21 billion in local procurement, N$2.5 billion in Royalties paid, N$6.85 billion in Wages & Salaries as well as a direct employment of just over 18 000. While the above proves to be a significant contribution, there exists a mutually beneficial opportunity to contribute more if the mining industry actively participates in the clean energy transitioning

In Namibia, we are fortunate to have a favourable Regulatory Framework that is supportive of clean energy penetration in the mining industry. The MSB model remains a lucrative one for the mining industry to get their operations powered by clean energy either through Power Purchase Agreements (PPAs) with IPPs, joint ventures with IPPs or own generation projects. Be that as it may, there exists a few hurdles and challenges that are hampering the uptake of clean energy by the mining industry.

The fluctuating nature of global commodity prices poses significant challenges of reduced Life of Mines (LoM) as well as the ability of mining operations to generate sufficient revenue that produces capital for investment in projects of this nature. A shorter LoM makes it extremely difficult for an operation to get into a PPA with tariffs that are competitive with a utility's tariff. Additionally, renewable energy plants such as Solar and Wind do not have the same inertia as conventional power plants. Grid inertia is the amount of kinetic energy stored in rotating generators of a power grid which provides the system with the ability to resist or ride through changes in frequency. This phenomenon is a limiting factor in achieving 100% clean energy for big industries such as mining but there is a lot of Research and Development work happening globally to overcome this challenge.

This raises the question of how the mining industry can be intentional about its role towards a world of clean energy. There is a well-known quote by John C. Maxwell that says, “Everything rises and falls on leadership.” Leadership commitment remains key regarding the discussions on energy transition as it sets the tone of the organisation. It is critical that top leadership of mining companies continue with the commitment and drive to harness the potential that the MSB model provides. It is equally important to

[foster a culture of energy conservation by identifying inefficiencies as well as energy wastages before considering alternative energy sources. Compressed Air and Steam leaks, for example, can waste as much as 20% to 30% of Compressors or Boilers’ output. Fixing these will ensure that the operation does not invest in an alternative energy generation plant to feed waste and inefficiencies. Consider starting small - Rooftop solar PV systems on carports and office blocks are some of the economic systems to invest in and start building data around savings as well as creating the much-needed excitement and traction. Mining companies can also consider electrifying their fleets by transitioning from diesel-powered machinery i.e., buses, light duty vehicles, forklifts, excavators, etc., to electric and/or battery electric. This provides a much less complicated transition as compared to finding other alternative fuels that are still in the infancy stages of development.

The mining sector has a pivotal role to play in shaping a sustainable future. By embracing clean energy, it can demonstrate that economic growth and environmental stewardship can be co-achieved. As we celebrate the International Day of Clean Energy, let us commit to reimagining mining as a force for good—a catalyst for a cleaner, greener tomorrow. Doing good today, guarantees a better, more sustainable tomorrow.

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