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**NATURAL RESOURCES PRACTICE** | EDITION 1 | OCTOBER 2021

# BENEATH THE SURFACE

# THE CHANGING FACE OF RENEWABLE ENERGY

**RENEWABLE ENERGY IS NO LONGER AN ALTERNATIVE. IT'S AN IMPERATIVE.**

## IN THIS ISSUE:

# RENEWABLE ENERGY IS THE NEW OIL

RENEWABLE ENERGY WILL DRIVE THE FUTURE AND WHILE IT MIGHT TAKE LONGER FOR SOUTH AFRICA TO SWITCH TO GREEN ENERGY, FAST TRACKING POWER PURCHASE AGREEMENTS WITH INDEPENDENT POWER PRODUCERS IS THE ONLY SOLUTION TO SOLVE THE CRISES IN OUR ELECTRICITY AND ECONOMY.

Back in 1994, the Economic Reform Programme (ERP) recommended that 30% of our national electricity be generated by alternative energy sources. Even though the target was more optimistic than most countries, which attribute 20-25% to renewable energy generation, the government understand that renewable energy was the future and South Africa needed to build capacity.

While this never came to fruition, there's hope still that this target might be met (and even exceeded) while boosting capacity to deliver on the country's power needs, especially as the Department of Mineral Resources and Energy (MRE) prepares to implement the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) to purchase electricity from Independent Power Producers (IPPs),

It's common knowledge that for years Eskom has been badly maintained through budget overruns, missed timelines and corruption. Andre de Ruyter, Eskom's newest in a string of CEOs, recently announced that the country can expect power supply shortfalls for at least another five years.

As a result, private energy generation among homeowners and businesses has surged up to one hundred megawatt (MW), which does not require a license from The National Energy Regulator of South Africa (NERSA). Until battery storage becomes more affordable and accessible, we're have to rely on coal and nuclear energy to be the baseload to the grid, particularly during peak periods that require guaranteed of power; however as technology advances, the storage of renewable energy in batteries will allow users to become entirely self-sustainable with a reliable energy supply.

For now, this self-generation cuts out municipalities, which rely heavily on the income they generate from the sale of electricity from Eskom to users – despite the fact that the parastatal is owed over R35.2 billion by various municipalities.

To solve our power supply shortly we need money. Let the private sector lead the way

Private sector investors are favoured for renewable energy projects as they can secure funding on commercial terms. This creates accountability in setting up contracts and aligning strategies to develop infrastructure at an agreed cost and delivery date.

The way parastatals and private businesses operate commercially is very different. IPPs are highly regulated and adhere to strict contracts to ensure that all corporate, administrative, financial and legal governance is in place. Their boards, shareholders and trusts hold them accountable to ensure their projects are commercially viable, while benefiting locals and empowering nearby communities through revenue-based social economic development fees. Private projects of this nature also include B-BBEE shareholding components.

Globally, we have seen that IPPs must register with a limited scope of operation in their Memorandum of Incorporation (MOI). In many cases, either due to a lack of capacity or ability, IPPs outsource the day-to-day business and administrative elements to O&M (operations and maintenance) providers or professional firms such as BDO so they can focus on securing the highest return for their shareholders.

While traditional power stations take five years to become fully operational from inception, IPPs take about a year to go online, which is hugely advantageous considering our current power shortfall. Once IPPs come online, energy supply can be fast tracked fairly quickly to 10-50MW to supply energy-intensive sectors like mining.

To remain profitable in the future, municipalities will try to retain their position as middle men by securing contracts directly with IPPs to supply surrounding communities. To date, Eskom has been the sole purchaser of electricity from IPPs. The Western Cape aims to semi-privatise electricity supply by signing Power Purchase Agreements (PPAs) with IPPs for six of its municipalities to start with and paying for the use of Eskom's grid to distribute electricity to its users.

To resolve the issue of revenue and distribution, Government has suggested dividing Eskom into two entities – a power producer and a distributor. On this premise, ahead of the REIPPPP's implementation, IPPs have been waiting for the parastatal to build new transmission stations to increase capacity and enable electricity distribution. While these costs and services should be undertaken by Eskom, the IPPs have started to build new transmission stations independently in the meantime to ensure that they meet their projected timelines. This as the global pandemic has already resulted in the holdup of equipment reaching South Africa, which has seen certain IPPs pay penalties for not being online in time.

While a reliable electricity supply from IPPs could be fairly cost effective for the end-user and hugely beneficial to the economy and foreign direct investment, there's the risk that it could be held to ransom by Eskom, which would have to undertake extensive retrenchments to make its business model sustainable. Electricity prices are likely to continue increasing if Eskom continues to be mismanaged.

Procuring an affordable and reliable electricity supply from IPPs is certainly much more affordable in the long run than mooring three 'power ships' at various South African ports. That is not to say that South Africa might not see a mixture of energy supply, with IPPs that use coal or gas, to help alleviate its electricity supply constraints. While these 'power ships' might appear to be a suitable short gap for now, as IPPs come online, they come at a hefty price. Instead, we need a long-term solution that benefits South Africans, creates new employment opportunities and will create long-lasting economic impact.

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# RENEWABLE ENERGY SHOULD POWER SOUTH AFRICA'S FUTURE ECONOMIC GROWTH

SOUTH AFRICA'S IMMENSE POTENTIAL FOR A GREEN ECONOMY AND RENEWABLE ENERGY – PARTICULARLY SOLAR, WIND AND HYDRO ENERGY – CAN HELP SECURE THE COUNTRY'S ENERGY SUPPLY, BOOST FOREIGN DIRECT INVESTMENT AND IMPROVE OUR CREDIT RATING. FOSTERING A GREEN ECONOMY ALSO MEANS CREATING EMPLOYMENT OPPORTUNITIES AND HELPING THE COUNTRY MEET ITS FUTURE CLIMATE COMMITMENTS.

Energy – renewable or non-renewable – is a substantial part of the global economy. As the global population grows and new energy-intensive industries emerge, we need to think about meeting these needs in a more sustainable, holistic, and affordable way.

To put it into perspective, doubling the share of renewables in the global energy within the next decade would see the global GDP increase by around 1.1% or $1.3 trillion, according to The International Renewable Energy Agency (IRENA).

The rapidly decreasing cost of renewable energy production, alongside more favourable policies for solar and onshore wind generation have made a strong business case for alternative energy sources in South Africa, especially in light of the beneficial long-term impact of sustainable energy in terms of climate change, human welfare, and future global green trading agreements.

South Africa has immense potential to expand into renewable energy production when compared with other regions. The country boasts some of the most sustained sunlight in the world and an abundance of water along its 2 800-kilometre coastline. The Planning and prospects for the renewable power: Eastern and Southern Africa report, published by IRENA in April, found that South Africa's largest wind zone, an area of 792 km2 in the southern region the country, has projected 5 808 GWh of wind energy by 2030. This represents a significant investment opportunity to diversify the power infrastructure of the country and the region.

Diversifying the country's energy mix to supply consistent power will provide opportunities for the public and private sector to catapult beyond current projections, while creating new job opportunities, even if the renewable energy supply is largely deployed using Eskom's existing infrastructure and municipal power grid.

Yet despite the significant opportunity, South Africa's Integrated Resource Plan continues to prioritise the ongoing use of coal in the future – not surprising given that the mining sector is a substantial employer. Additionally, as ongoing media reports have outlined, many in senior positions (both public and private) have benefited (for years) from over-inflated tender deals, and are unwilling to release their clutches from the parastatal just yet. This is despite debt investigations amounting to R411 billion (and questionable tenders to the tune of R178 billion). Even the National Treasury admits that Eskom is the largest threat to our country's future economic development.

*Though reality cannot be denied. The IRENA report goes on to say:* "In South Africa, over the last 20 years, underlying coal production costs have risen significantly, rendering coal increasingly uncompetitive against other fuel sources. At the same time, the deployment costs of renewable energy have decreased by over 50% for both solar PV and onshore wind since 2011."

If Eskom were to source, and subsequently, supply a steady flow of renewable energy via Independent Power Producers (IPPs) as part of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), this would create more investment certainty within the private sector, including from coveted foreign investors.

The dire state of energy in South Africa hits closer to home than just the revolving door of coal tenders. Nowhere is this more evident than seeing the value of the rand. The rand is infamously one of the world's most politicised currencies, and has devalued substantially in the last decade. Each time South Africa is hit with another series of blackouts (or "load shedding") or the government makes yet another faux pas, the rand takes a hit. This translates to rating agency downgrades, making investing in South Africa a riskier bet. Turning to a more renewable energy future can propel South Africa forward.

At a macroeconomic level, renewable energy deployment has near boundless potential to stimulate the economy and attract further investment.

Establishing new renewable energy projects across the country will involve industries outside of the energy sector, in terms of the construction of infrastructure, the supply of basic necessities and access to retail, housing, schooling as well as a variety of other secondary and tertiary products and services. While at a micro-economic level, we'll see the knock-on effect of increased consumer spending across various sectors and industries. The more people have jobs, the more money they're likely to spend.

The question, of course, remains as to whether the renewable energy sector will be as people-intensive, namely - will the coal jobs lost be replaced? Either way, replacing non-renewable energy sources with renewable ones requires transparency from our political leaders. A green transition needs to be guided by thorough planning and prospecting. Readying tertiary education institutions and the labour force for this transition needs to be accompanied with private sector support – meaning the public sector must collaborate with the private sector, and if needed, design business incentives to invest.

South Africa will remain a competitive destination to invest in renewables and Green Economy developments, with the caveat that this is backed by the political will to break free of non-renewable sources, implement sound (green) energy policies, and establish a business-friendly environment for the industry.

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# HOW THE SURGE IN CRYPTO MINING IS IMPACTING RENEWABLE ENERGY

WITH THE RIGHT APPROACH TO ENERGY RESOURCES, SOUTH AFRICA IS SET TO BE PRIME SPACE FOR ESTABLISHING CRYPTOCURRENCY MINING ECONOMIC ZONES.

Energy consumption in the mining and transacting of cryptocurrencies is facing increasing public scrutiny. The Bitcoin market now exceeds $1 trillion and the energy consumed by mining Bitcoins alone could reach 128 TWh (terawatt-hours) by the end of the year, according to the Cambridge Bitcoin Electricity Consumption Index (CBECI), compiled by Cambridge University researchers. To put this into perspective, the amount of electricity consumed by the Bitcoin network in one year could power all the kettles used to boil water in the United Kingdom for 15 years – or more than the Netherlands uses in a year. Bitcoin mining now uses 66 times more electricity than it did in 2015, and the number is only set to increase. And this does not even take into consideration all the other cryptocurrencies, of which there are more than 4 000.

Substantial financial rewards are driving the rise in giant data centres dedicated to cryptocurrency mining. These consume monumental amounts of power on an ongoing basis because they make use of specialised, large-scale and high-powered computing devices. Add to that the economies of scale and the growth of global investment interest in cryptocurrencies and it becomes clear why there is global concern about the massive carbon footprint of these mining farms.

Coal and other fossil fuels are traditionally used to generate the power used for cryptocurrency mining, which creates a surge in greenhouse gas emissions that add to the growing climate crisis. But, there is an alternative that makes environmental and economic sense – renewable energy.

The private sector-led non-profit Crypto Climate Accord (CCA) seeks to eliminate carbon emissions from the crypto industry by moving all blockchains to renewable energy by 2030, if not sooner. And, by 2040 it wants the crypto industry to reach 'net zero' emissions or to become entirely carbon neutral.

To successfully combat climate change, crypto miners will have to switch from using electricity generated by burning fossil fuels to using clean energy sources, such as wind and solar power; whilst other technological innovations can reduce greenhouse gas emissions through energy efficiency or by capturing these gases before they escape into the atmosphere.

South Africa has ample supply of sustained sunlight hours throughout the year, lengthy coastlines and an abundance of dams – all of which offer it immense potential to expand into sustainable renewable energy production. The Planning and prospects for the renewable power: Eastern and Southern Africa report published by IRENA in April 2021, found that South Africa's largest wind zone, an area of 792 km2 in the Eastern Cape, has projected 5 808 GWh of wind energy by 2030. This represents a significant investment opportunity to diversify the country's and region's power infrastructure and energy mix, according to the findings.

However, the transition to renewable energy must be done responsibly to stimulate the economy and attract further investment. Stakeholders have raised concerns about whether renewable energy might mean a loss of jobs across the coal sector. There are further concerns that operational complexities and tax challenges between Independent Power Producers (IPPs) and policy positions and actions that have tended to be reactive and driven more by crisis management than by forward-looking leadership.

Like much of the world, the South African government has pegged 2050 as the deadline for net-zero emissions. Many are hopeful that cryptocurrency may potentially expedite the transition. The future of crypto is validated by its profits. After the fixed costs of capital equipment, electricity costs make up the largest percentage of a crypto miners' costs. Therefore, the decreasing cost of electricity is the biggest leverage to profit margin. The question is, can adopting cryptocurrencies as a legal means of tender fast-forward the clean energy transition?

South Africa launched renewable energy tenders in 2021 as part of the fifth window of the Renewable Energy Independent Power Producer Programme (REIPPP) to encourage IPPs to invest in green technology. The gazetting of a Ministerial Determination opens the way for procurement of 11 813 MW over the next three years. This would comprise of 4 800 MW of onshore wind; 2 000 MW of solar photovoltaic (PV); along with 513 MW of battery energy storage; 3 000 MW of gas or diesel; and 1 500 MW of new coal.

Successfully implementing this transition will require coordinated efforts across the public and private sectors with sufficient regulation in place. Platforms for transparent public-private exchange and knowledge sharing will be crucial, alongside the responsible management and mitigation of risk. This will allow for the creation of stable policy and long-term frameworks, while improving market design and de-risking investments and adopting renewable-focused integrated planning strategies. The early involvement of local communities, continued collaboration with all stakeholders and inclusive decision-making processes are key to ensuring that renewable energy projects lead to long-term development.

For now, the scale-up to increased renewable energy supply by 2030 is going to have to be exponential. In fact, it has been touted as the biggest shift in South Africa's electricity supply industry since the formation of Eskom nearly a century ago.

Although cryptocurrencies may fluctuate in value much faster than many other investments, the reality is that they are here to stay. As a country with a rich heritage of mining pioneers, we are once again presented with the natural resources needed – albeit solar, hydro and wind – to successfully and sustainably mine this digital gold.

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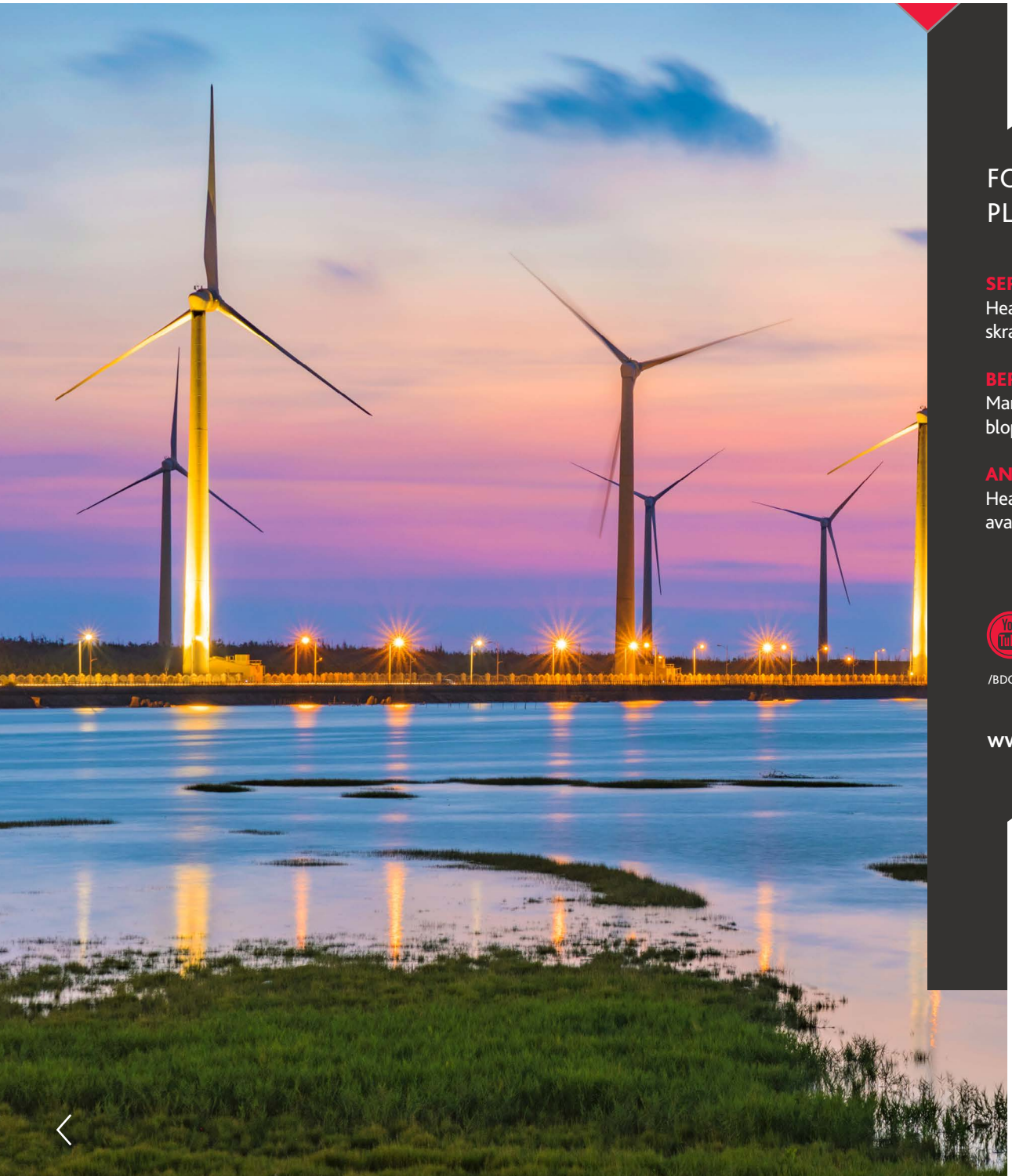

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