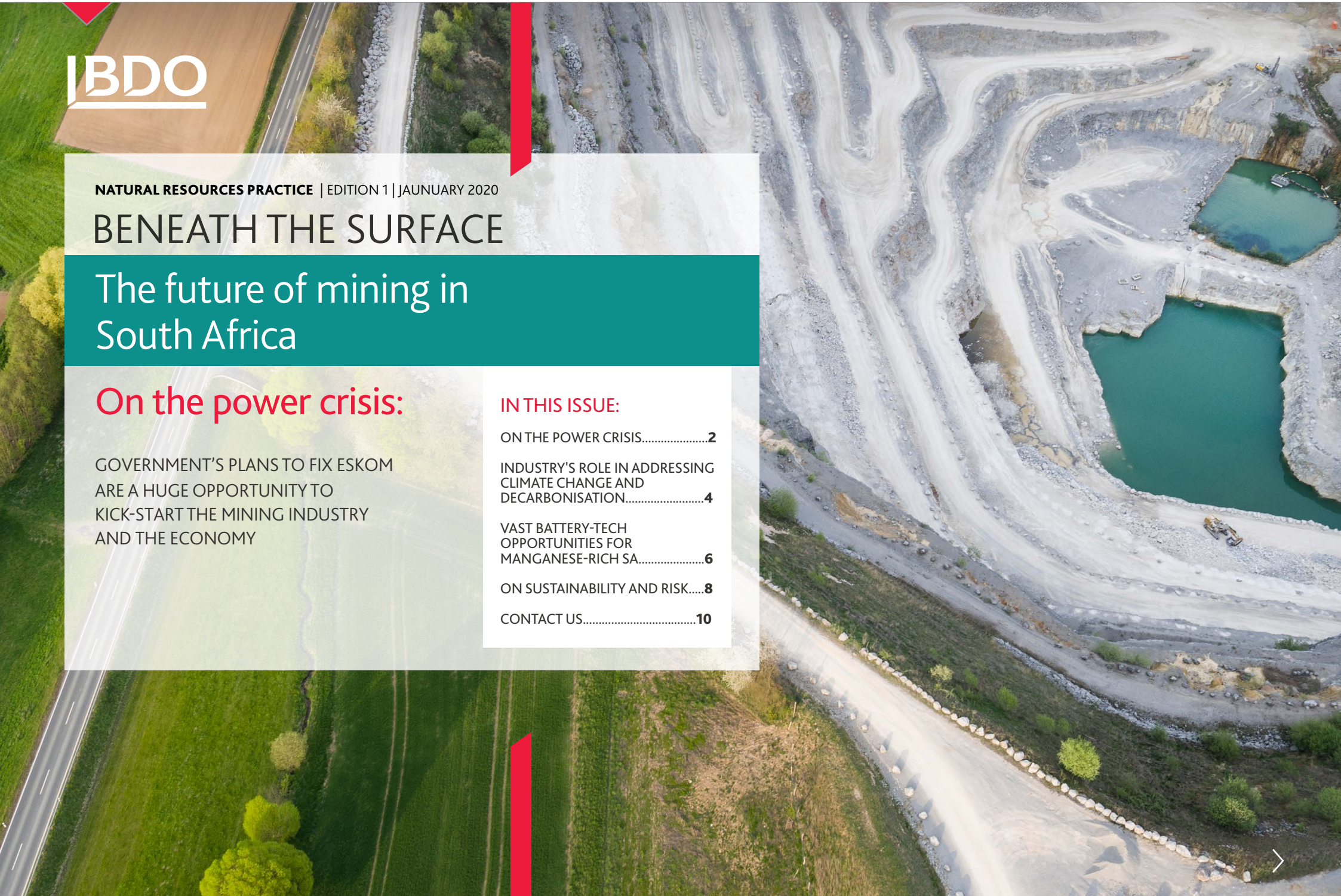


NATURAL RESOURCES PRACTICE | EDITION 1 | JAUNUARY 2020

BENEATH THE SURFACE

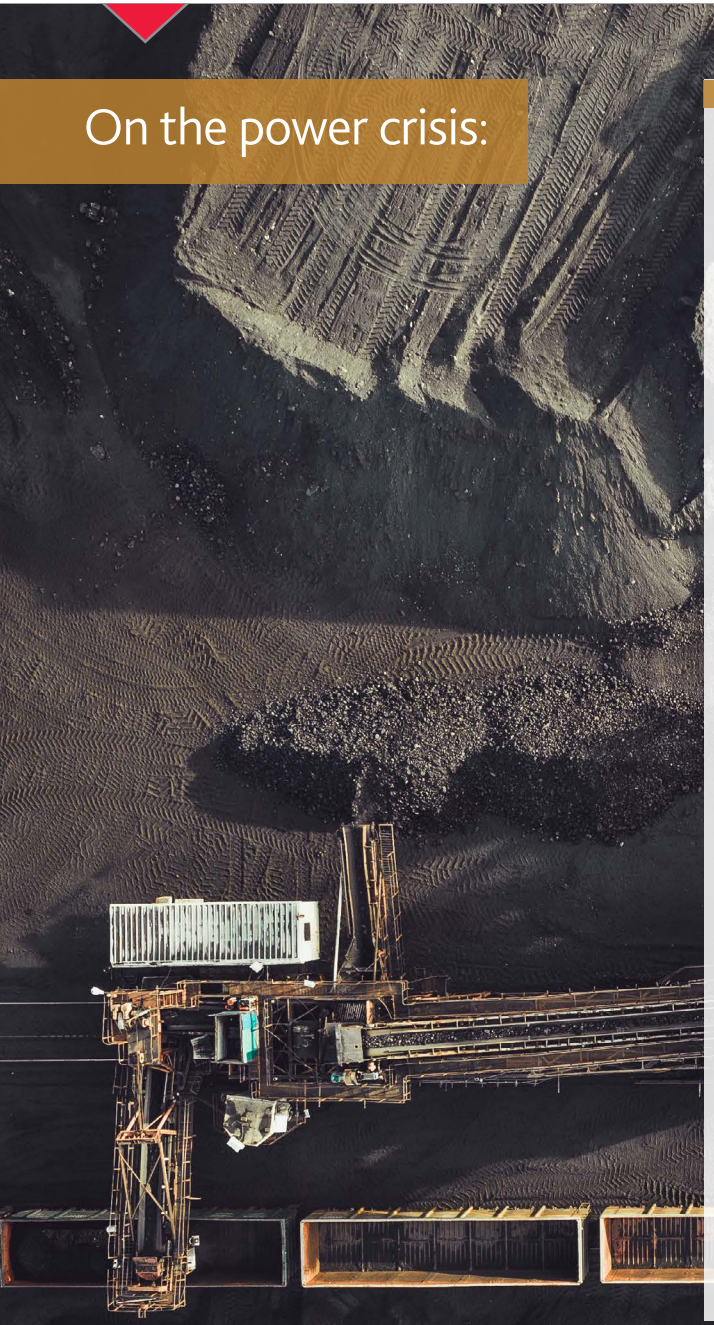
The future of mining in South Africa

On the power crisis:

GOVERNMENT'S PLANS TO FIX ESKOM ARE A HUGE OPPORTUNITY TO KICK-START THE MINING INDUSTRY AND THE ECONOMY

IN THIS ISSUE:

On the power crisis:



Hardly a day goes past without the status of our electricity grid being in the news, often for the wrong reasons. In December, the mining industry experienced enforced power cuts and some shafts and smelters stopped production. Some mines were also forced to reduce power supplies to water pumping and ventilation units.

The challenges which Eskom faces are well publicised and include frequent changes in senior management, corruption in tendering processes and non-payment of accounts by customers.

This in turn contributed to low staff morale, inadequate resources being available for maintenance, liquidity problems and very large debt servicing costs. The solvency of Eskom has also become a factor in the international ratings agencies downgrading South Africa's sovereign ratings, given that the government has guaranteed the repayment of a large proportion of Eskom's debt to its lenders.

The problems are well publicised, but one needs to look at the way forward for the decision-makers and whether we can see any signs for improvement.

Government is currently the sole shareholder in Eskom. In addition, the electricity generating sector is tightly controlled by the government, as it is the Minister's prerogative, (as provided for in Section 34 of the Electricity Regulation Act), to ensure security of electricity supply through determining, among other things, the size, technology type, which entity produces the electricity, and by when it should be connected to the grid.

Eskom's coal-fired power stations, currently account for 71% of installed generating capacity (according to a table in the Energy Alert published by CDH on 21 October 2019) and will be estimated to have 43% of installed capacity by 2030 and will still be contributing 59% of energy supply by then.1

Government is currently the dominant figure in the energy supply market through its control of the regulatory framework, its ownership of the dominant energy producer, and its ability to make management appointments at Eskom.

Government therefore has the ability to change course and to reverse some of the negative trends. There are some encouraging signs that government is taking some steps in the right direction.

A recent indication of this new approach was with the appointment of a chief executive from the private sector who will be able to act more independently. A further positive sign was the announcement that Eskom will be restructured into three business units, being generation, transmission and distribution. We understand that the thinking behind this is that it will allow the units to be streamlined somewhat, and to allow for a degree of privatisation going forward, although this has not been publicly stated.

An indication of government's resolve to make changes to the sector through changes to the regulatory framework, was the publication of the updated Integrated Resource Plan (IRP) on 18 October 20182 with a stated objective as follows:

"The IRP is an electricity infrastructure development plan based on least-cost electricity supply and demand balance, taking into account security of supply and the environment."

There has been some positive reaction to the plan, notably from the Council for Scientific and Industrial Research which has commented as follows:

"The finalisation of the IRP should provide the necessary certainty to all stakeholders as far as security of supply and energy mix choices in the medium to long-term is concerned."3

On the power crisis:

If we look at the challenges facing Eskom and the response from government to the problems, we can see that there has been a lot of thought put into formulating the plans that are required to turn Eskom around, and to reform the country's existing energy mix via changes in energy policy. It remains to be seen whether the government has the political will to push through with the reforms that it has identified. It will face fierce resistance from the unions if the restructuring plans result in job losses, and partial privatisation possibly and the unions have already been very critical of the appointment of the new Chief Executive because they see it as a setback for transformation.

Government has identified the challenges that it faces and it has put in place a plan to turn Eskom around. The country and the mining industry will be keen spectators. The plan is a good one by all accounts, but it must be followed up, and government must have the courage to implement it as it was intended. If they succeed it could inspire improved sentiment in many spheres, such as our debt ratings, the export-led mining industry and business confidence in general. This will have a knock-on effect of encouraging much needed investment to expand the economy, and the mining sector in particular.

This is a huge opportunity and it should not to be missed by government.

1. ENEGRY ALERT
2. INTERGATRED RESOURCE PLAN 2019
3. CSIR'S REACTION ON THE GAZETTED INTEGRATED RESOURCES PLAN 2019

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Industry's role in addressing climate change and decarbonisation

It is clear that as we enter a new decade, climate change will continue to be at the top of the world's agenda and, regardless of what country you live in, there are daily reminders of climate change in the news.

The global mining industry is a significant contributor of energy-related greenhouse gas emissions, with South Africa being the world's 14th largest emitter of greenhouse gases - the country emits nearly 500 million tons of carbon dioxide each year. South African's carbon dioxide emissions are principally due to its heavy reliance on coal.

Coal power plants, in addition to polluting the areas around them, are responsible for almost half of South Africa's carbon emissions and thus coal power plants are among the major contributors to global climate change. South Africa has already warmed at a rate twice the global average, and climate change is making droughts in South Africa more extreme and more frequent.

Under the Paris Agreement on Climate Change, of which South Africa is a signatory, governments committed to significantly reduce their carbon emissions by phasing out fossil fuels. Given that 80-90% of energy in South Africa is produced from coal, this is likely to be challenging.

In its 2019 Integrated Resource Plan ('2019 IRP') the South African Government envisages that "by 2030, South Africa will have an energy sector that provides reliable and efficient energy service at competitive rates; that is socially equitable through expanded access to energy at affordable tariffs; and that is environmentally sustainable through reduced emissions and pollution".

Whilst South Africa is committed to reducing emissions, it assumed that emissions will peak between 2020 and 2025 as the Medupi and Kusile coal plants are brought on-line, then plateau for approximately a decade and then decline in absolute terms as old coal-fired power plants are decommissioned.

That said, it is expected that coal will continue to play an important role in the South African economy, and the 2019 IRP highlights that "carbon capture and storage, underground coal gasification, and other clean coal technologies are critical considerations that will enable us to continue using our coal resources in an environmentally responsible way into the future". As such, it is clear that the industry will need to commit to investing in and using clean coal technologies in order to actively participate in the country's transition to a low carbon economy. However, ensuring that South Africa remains competitive and able to meet energy demands in the context of a developing economy, while at the same time reducing the country's carbon emissions, will require close collaboration between all stakeholders including suppliers, users of coal, the government and regulators.

But why should mining companies care about climate change?

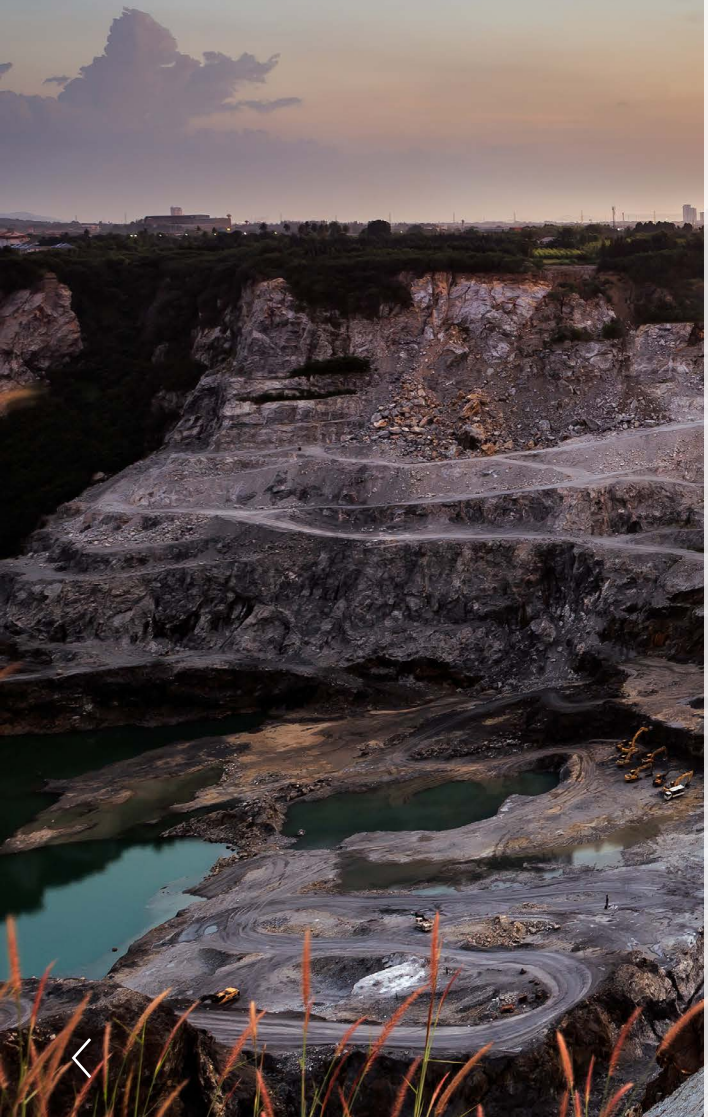
Climate change will not only have a significant impact with regards to the constraints on the supply of critical inputs to mining processes, such as water and energy but mining companies may find it more difficult to obtain and maintain a social licence to operate in communities in which climate change exacerbates existing vulnerabilities and increases direct competition between the company and the community for resources. In addition, mining companies are likely to face increased pressure and scrutiny from both investors and climate change activists.

So what are mining companies doing to minimise their carbon emissions?

Mining companies are slowly starting to transition towards a lower carbon future by investing in gas, wind, hydro and solar energy alternatives.

Engineering News reported that at the annual African wind energy summit, the Windaba, in Cape Town in October Gold Fields VP and group head of carbon and energy Tsakani Mthombeni said the gold

Industry's role in addressing climate change and decarbonisation



miner was gradually transitioning towards a low-carbon and renewable energy environment.

"Ten years ago, you would not have heard anyone talk about renewables in mining, but things are changing. Financiers locally and globally are coming under pressure to be seen to be funding low carbon projects," Mthombeni told a special session on mining.

So far we have seen more development in the use of renewables outside of South Africa with some key examples being Gold Fields partnering with power company, Aggreko, to install a hybrid solar and battery generation system to provide electricity to its Granny Smith gold mine near Laverton, Western Australia; Glencore's Raglan nickel mine in Quebec and Rio Tinto's Diavik diamond mine in Northwest Territories—both in Canada—installing on-site wind turbines to offset some of their reliance on diesel; Newcrest's Lihir gold mine in Papua New Guinea drawing a significant portion of its energy from geothermal sources; IAMGOLD's Rosebel gold mine in Suriname and B2Gold's mine in Namibia installing solar grids on site, which will be transferred to local communities to meet their energy needs once the mine closes; Goldcorp pursuing full electrification at its Borden Lake deposit, and planning to make the mine Canada's first all-electric operation, and the world's first diesel-free hard rock mine.

South Africa's Exxaro Resources Ltd has said that it is working on a new strategy for its business founded on coal mining amid investor and public concerns about the impact of climate change. The company said its planning "structural changes," including clean-power initiatives, to make the business sustainable in the long term.

Much more still needs to be done, especially in South Africa, but these are encouraging steps in the right direction.

However, it must be noted that while a move to renewable energies is said to be a positive for the environment and climate change, some minerals and metals are, in fact, required for many of today's low carbon technologies. Metals, like copper, aluminium and platinum, and non-metallurgical coal are vital for developing a renewable energy infrastructure. Photovoltaic solar panels, catalytic converters and wind turbines are just a few examples of alternative energy technologies which rely on the mining and metals industry for its product development and manufacturing. Key is how these mining companies will make use of cleaner technologies in the extraction of these minerals.

Whilst mining companies are starting to take steps to mitigate the impact of climate change, the South African government has also developed measures to mitigate the effects of climate change including the introduction of carbon taxes and climate change legislation. The government has introduced the first phase of the carbon tax, running from 1 June 2019 to 31 December 2022, for direct emitters or companies that own assets burning fuel.

During the first phase there will be a relatively modest carbon tax rate ranging from R6 to R48 per tonne of CO2 equivalent emitted, which is a low tax rate providing current significant emitters time to transition their operations to cleaner technologies through investments in energy efficiency, renewables and other low carbon measures.

Given the carbon tax rates will likely increase in the second phase, climate change and reducing carbon emissions is going to be a key focus area for both mining companies and the energy industry going forward and needs to be part of all company's business strategy. Whilst significant investment is likely to be required in the short to medium term to fund the transition to alternative energy technologies, companies will hope to benefit from the positive effects from all stakeholders, including investors, environmental groups, governments and communities.

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Vast battery-tech opportunities for manganese-rich SA

The move towards battery-powered electric vehicles can boost the economy – if we seize the chance and embrace beneficiation and manufacturing industrial revolution

The global motor industry is moving increasingly towards electric vehicles (EVs) from the carbon-emitting internal combustion engine. This requires extensive investment in battery technology, which presents massive opportunities for South African mining.

Various rare-earth minerals are used to manufacture batteries for electric vehicles, but the bulk commodity manganese is a major component of the NMC (nickel-manganese-cobalt) lithium-ion batteries likely to power much of the next generation of EVs.

South Africa is by far the world's largest manganese producer1, and is estimated to have 70% of the world's manganese reserves.

Sam Jaffe, MD of Cairn Energy Research Advisors, speaking at the 2019 Batteries and Electric Vehicles Conference, predicted that EV market penetration would be far faster in the Asia Pacific compared to Europe, but was growing rapidly.

China's EV30@30 Scenario anticipates EVs accounting for 70% of all vehicle sales in 20302.

Given the opportunity, it is imperative that more South African companies expand into fully functional EV battery offerings, as opposed to simply riding the manganese commodity wave.

In this context, special economic Zones (SEZs), with their preferential corporate tax rates, employment incentives and customs benefits, are an attractive option for manufacturers.

South Africa has 10 SEZs, with several more in the planning stages. Among these, the Coega SEZ is the largest, with a reported 45 operational investors worth a combined R11,6-billion3.

Coega offers a business location purpose-built for manufacturing including beneficiation of export goods, investment and local socio-economic growth, adjacent to a modern, deep-water port with container, bulk and break-bulk terminals, integrated with rail networks for efficient commodity logistics.

Coega Development Corporation (CDC) business development metallurgic sector manager Sadick Davids has pointed out4 that the SEZ is the "ideal location in terms of readiness for the beneficiation of manganese".

Besides the infrastructure, the Coega SEZ also has the skills capacity for battery manufacture thanks to Eveready Batteries, long established in Coega's host city of Port Elizabeth.

Already, there are moves afoot to leverage these advantages and to establish battery-manufacturing facilities around Coega.

Megamillion Investment company announced at the recent Batteries and Electric Vehicles conference at Nelson Mandela University in Port Elizabeth that the Coega SEZ will be the site of Africa's first lithium-ion battery mega-factory.

Nechan Naicker, Founder and CEO of Megamillion Energy Company, said work would start in 2020 on a 20 000 m2 pilot plant at Coega. He said it would be "a scalable world-class 0,2GWh manufacturing facility" capable of producing about 10 million lithium-ion cells per year.

He said the initial focus would be to produce affordable cells for Africa. The master plan is to work with technology partners from Asia to scale up to an output of 32GWh of cells per year by 2028, producing for both the energy storage and electric vehicle markets.

Vast battery-tech opportunities for manganese-rich SA

The move towards battery-powered electric vehicles can boost the economy – if we seize the chance and embrace beneficiation and manufacturing industrial revolution

South Africa's largest conventional battery manufacturer, Metair Investments, has also entered the field, via a 35% shareholding in Prime Motors, but they have located their pilot plant in Romania, assisted by a government grant.

In Mintek and the CSIR, South Africa has two partially state-funded institutions that undertake research and development projects to aid the economy. Mintek specifically targets beneficiation and minerals processing, whilst the CSIR has a much wider ambit.

The emergence of this specific application of battery technology using local materials would justify further research in this area by one of these bodies, perhaps in collaboration with a local university.

Metair already has such a partnership with the University of the Western Cape (UWC), whereby they will partner with the South African Institute for Advanced Materials Chemistry (SAIAMC) – also located at UWC, which houses the only pilot-scale li-ion battery cell assembly facility in Africa.

Metair's agreement with UWC will see the company invest R3-million over three years to pilot a prototype lithium production project, to improve equipment and to sponsor one local post-doctoral fellow to be trained at Argonne National Laboratory in the US.

The 2018 Department of Trade and Industry (DTI) Industrial Policy Action Plan referred to programmes being launched for the beneficiation of minerals, but these were restricted to two very focused projects – fuel cell research for platinum group metals, and vanadium battery storage technology. It seems there is a good case for the DTI extending these to lithium-ion battery applications.

If such plants are built on a sufficiently large scale, South Africa will benefit from the local component of the value chain. Minerals-beneficiation projects with a reliable local customer manufacturing an export product can link manganese prices to export market prices. This can avoid the prospect of a dual local/export pricing model as exists in the coal mining sector.

Given South Africa's natural suitability for lithium-ion battery manufacturing, more could be done by manufacturers and the government to fund research and incentivise the development of these manufacturing opportunities.

The success of the Automotive Development Programme would be enhanced with this additional manufacturing within South African. The new Automotive Master Plan which is scheduled to commence on 1 January 2021 would assist component manufacturers and original equipment manufacturers in developing this new technology in South Africa for the global automotive market. South Africa has a unique opportunity to capitalise on the trend towards electric vehicles and manganese-powered battery technology. There is potential for significant minerals-beneficiation projects, and an opportunity to change our status as simply an exporter of raw materials.

High-technology manufacturing can dovetail effectively with the relatively lower-technology mining industry to transform the commodities sector, with vast benefits for employment, the local economy and South Africa society at large.

4. Manganese Reserves by Country

5. New CEM campaign aims for goal of 30% new electric vehicle sales by 2030

6. South African Special Economic Zones Programme

7. Coega perfectly poised to participate in lithium-ion battery industry – CDC

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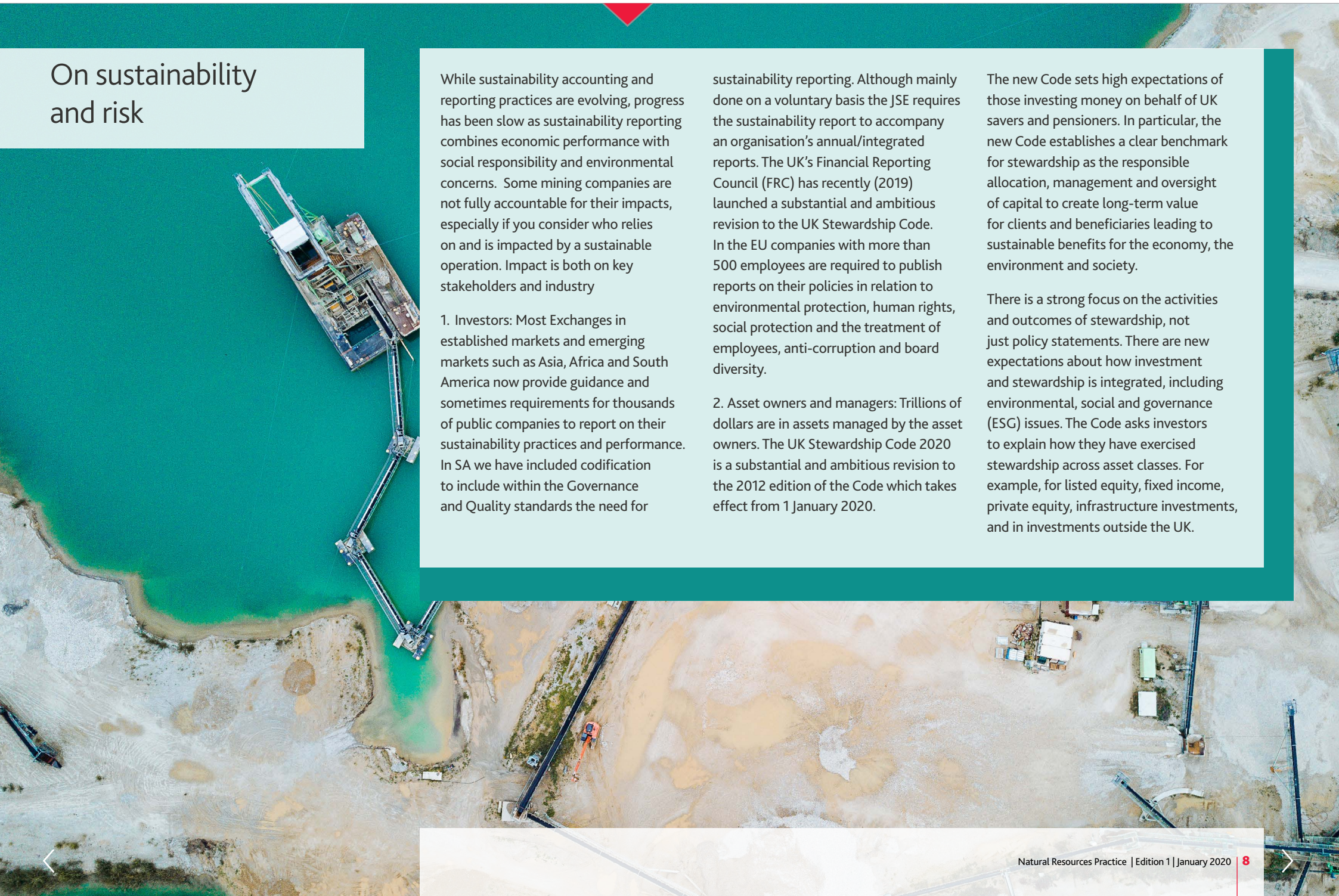
On sustainability and risk



While sustainability accounting and reporting practices are evolving, progress has been slow as sustainability reporting combines economic performance with social responsibility and environmental concerns. Some mining companies are not fully accountable for their impacts, especially if you consider who relies on and is impacted by a sustainable operation. Impact is both on key stakeholders and industry

1. Investors: Most Exchanges in established markets and emerging markets such as Asia, Africa and South America now provide guidance and sometimes requirements for thousands of public companies to report on their sustainability practices and performance. In SA we have included codification to include within the Governance and Quality standards the need for sustainability reporting. Although mainly done on a voluntary basis the JSE requires the sustainability report to accompany an organisation's annual/integrated reports. The UK's Financial Reporting Council (FRC) has recently (2019) launched a substantial and ambitious revision to the UK Stewardship Code. In the EU companies with more than 500 employees are required to publish reports on their policies in relation to environmental protection, human rights, social protection and the treatment of employees, anti-corruption and board diversity.

2. Asset owners and managers: Trillions of dollars are in assets managed by the asset owners. The UK Stewardship Code 2020 is a substantial and ambitious revision to the 2012 edition of the Code which takes effect from 1 January 2020.

The new Code sets high expectations of those investing money on behalf of UK savers and pensioners. In particular, the new Code establishes a clear benchmark for stewardship as the responsible allocation, management and oversight of capital to create long-term value for clients and beneficiaries leading to sustainable benefits for the economy, the environment and society.

There is a strong focus on the activities and outcomes of stewardship, not just policy statements. There are new expectations about how investment and stewardship is integrated, including environmental, social and governance (ESG) issues. The Code asks investors to explain how they have exercised stewardship across asset classes. For example, for listed equity, fixed income, private equity, infrastructure investments, and in investments outside the UK.

On sustainability and risk

The Code consists of 12 Principles for asset managers and asset owners, and six Principles for service providers. These are supported by reporting expectations which indicate the information that should be publicly reported in order to become a signatory.

Organisations wanting to become signatories to the Code will be required to produce an annual Stewardship Report explaining how they have applied the Code in the previous 12 months. The FRC will evaluate Reports against our assessment framework, and those that meet the reporting expectations will be listed as signatories to the Code. To be included in the first list of signatories, organisations must submit a final report to the FRC by 31 March 2021.

Indexes such as the FTSE4good which are aimed at ethical investment markets takes sustainability into consideration. The FTSE4Good criteria is applied to emerging countries and markets, this is a step towards sustainable investment and practises by companies throughout the world.

3. Employees: with the various generations in the workplace, millennials play a key role in defining the workforce and workplace. Millennials are the younger workplace colleagues being those born between 1983-1995, have in recent studies been found to be 'aligned' with the generation's priorities: 39% of millennials believe that businesses should try to improve society, but only 25% think that their employers make this a priority. Only 24% of millennials think that generating profits is a priority, but 51% think that it is their employers' priority. It is estimated that by 2025 75% of the workforce will consist of millennials.

4. Consumers: the consumers who are closest to sustainability problems, are those from Africa, Asia, Latin America and the Middle East who bear the cost and are willing to pay a premium greater than consumers in rich, industrialised countries.

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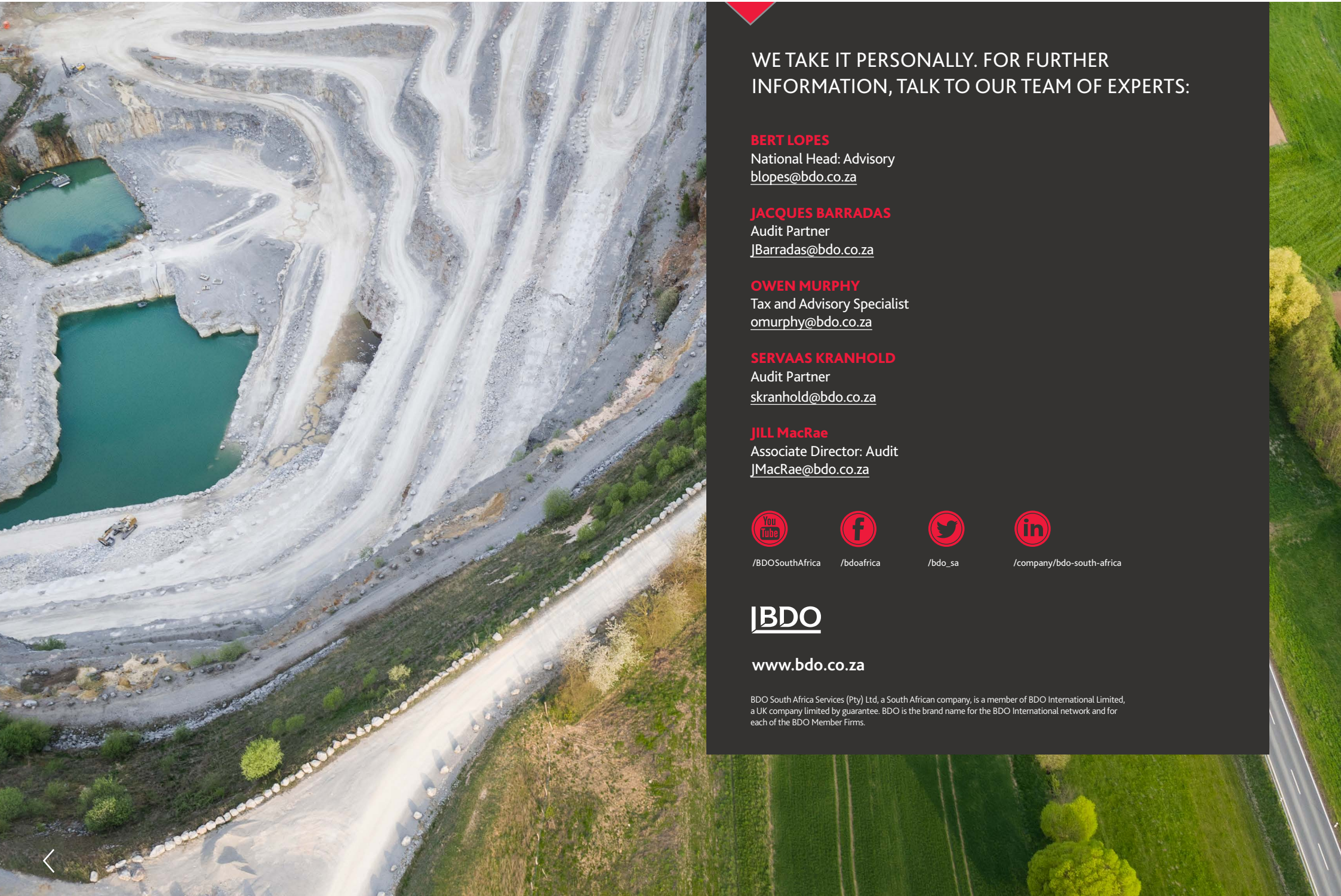

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